



VERIFICATION REPORT FOR REMEDIAL WORKS

Phase 2A Development Area Skelton Grange Leeds

Reference	5162-JPG-2A-XX-RP-G-0624-S2-P01
Date	April 2024
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C O N T E N T S

Confidentiality Statement

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Appendix F Post-Earthworks Ground Gas Verification Report by Ground Gas Solutions (Phase 2A only)



CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Templegate Developments Limited
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Halifax Road
BRADFORD
BD6 2SZ

This report has been prepared for the sole use and reliance of the above-named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Revision	Date	Revision Details	Status	Author(s)	Approved
P01	10.04. 2024	First Issue	Information	EJS	JBW



1.0 INTRODUCTION

1.1 Instruction

JPG (Leeds) Limited has been instructed by Templegate Developments Limited to prepare a verification report for remedial works carried out for the Phase 2A development area at Skelton Gate, Leeds.

A Remedial Strategy Report was prepared for the site in February 2022 and updated in June 2022 following liaison with Leeds City Council's Contaminated Land Officer.

1.2 Location

The site is located to the south and east of the M1 motorway, approximately 5km to the south east of Leeds city centre (approximate NGR 435538, 431059).

A site location plan is provided as Figure 1 in Appendix A.

1.3 Site Description and Topography

Skelton Gate is a former opencast coal site, which since restoration, has been used for agricultural land and areas of landscaping. There was no development, buildings or otherwise, present on the Phase 2A site prior to the recent earthworks operation. The ground surface generally consisted of uneven scrubland, which was locally overgrown.

This report pertains to the proposed residential development within the Phase 2A area of the Skelton Gate site. The proposed Phase 2A residential area extends to a total area of approximately 3.7 hectares. An aerial photograph of the site showing the Phase 2A development area is provided as Figure 2 in Appendix A.

The landform within the Phase 2A area generally slopes downwards to Colton Beck located to the south. The site lies at an elevation of between approximately 27m AOD in the north east and 21m AOD in the south west.

The Phase 2A site's boundaries are defined by a section of new adoptable highway to the north, adjacent landscaping and Colton Beck to the east and south and landscaping to the west.

An aerial photograph of the site is provided as Figure 2 in Appendix A.

1.4 Proposed Development

It is proposed to develop the Phase 2A development area with new housing and associated infrastructure.

Development layout is to be confirmed by the residential developer.



1.5 Ground Conditions Pre-Earthworks & Contamination

The whole Phase 2A site is underlain by infilled/made ground, associated with the infilled opencast coal workings.

The underlying bedrock comprises Pennine Lower Coal Measures strata of mudstone, siltstone, sandstone and coal seams. Strata dip is indicated to be gently to the south west.

Previous ground investigation confirmed a thin veneer of sandy, clayey topsoil, typically 300mm, across the majority of the site.

The topsoil is generally underlain by brown, sandy, gravelly clay; the gravel component consisting of mudstone, siltstone, sandstone and rare coal fragments present to typical depths of 1.50m bgl. It is likely that this subsoil capping layer is reworked natural (completely weathered coal measures) soils, extracted and stockpiled separately as part of the coaling operation.

The subsoil/capping layer is underlain by colliery spoil, described as grey gravelly clay with locally interbeds of clayey gravel, often with varying proportions of cobbles and boulders. The gravel, cobble and boulder content were found to generally comprise mudstone and siltstone with various proportions of sandstone and, less frequently, coal. The material is considered typical of re-placed opencast overburden material.

Deep made ground (>30m bgl) was proven below Phase 2A (maximum proven depth to base of 52.80m bgl in west).

Natural ground was only encountered at shallow depth (<10m) where a buried highwall is present near the surface of the site in the north east, adjacent to Pontefract Road, and not below the Phase 2A residential development area.

No concentrations of contaminants above screening values for a residential development with homegrown produce end use were recorded as part of previous ground investigations. However, the colliery spoil made ground was found locally to contain potentially combustible material with a calorific value of >2MJ/kg.

1.6 Scope of Works

The primary objective of the earthworks was to render the proposed Phase 2A development area suitable for a residential development. In order to achieve this, the site was to be excavated in a series of 'cuts', to produce level platforms to allow dynamic compaction, followed by re-engineering of soils to required formation levels.

The overall scope of works is detailed in the specification for earthworks and preparatory works prepared by JPG and referenced below:

- JPG. Specification for Earthworks & Preparatory Works. Skelton Gate Phase 2, Leeds. 5162-XX-XX-SP-G-0402-A5-P02, dated February 2022.



The specification is not included here, but a brief outline of the works relating to geoenvironmental aspects is set out below:

- Decommissioning of pre-earthworks deep ground gas monitoring wells.
- Removal of remaining existing vegetation (trees/bushes etc.) from the site as necessary to facilitate the works.
- Topsoil is to be stockpiled separately to the other made ground soils. On completion of the earthwork's operation, 300mm of the topsoil is to be replaced over the formation level.
- Sufficient volume of the brown subsoil capping made ground is to be stockpiled separately. This material is to be retained within the upper 1.00m below finished formation level. Colliery spoil made ground ('grey fill') is not to be retained within the upper 1.00m below finished ground level due to the potential for elevated calorific value.
- Excavation of made ground to create level platforms in order to carry out dynamic deep compaction. Materials will be brought onto site in order to create working platforms for the dynamic compaction plant.
- Made ground with elevated calorific values (>2MJ/kg) shall not remain within 1m of finished ground levels. Calorific value testing will be required as part of the earthworks in order to confirm that the soils left within <1m of the finished ground levels are not potentially combustible.
- Shallow wells are to be installed and monitored on completion of the dynamic compaction/earthworks to verify that the ground gas regime is similar to the previous findings (or better). These verification works are to be carried out by Ground Gas Solutions (GGS). On completion GGS are to prepare a report advising the residential developers of the appropriate gas protection requirements for new buildings constructed on the site.
- Decommissioning of post-earthworks shallow ground gas monitoring wells.



2.0 VALIDATION OF PREPARATORY & EARTHWORKS

2.1 General

The earthworks were undertaken by Hall Construction Services Ltd (HCSL) during an approximately nine-month period, between July 2022 and March 2023.

The works were undertaken in a staged approach, as described briefly below. Photographic records are presented in Appendix B.

2.2 Decommissioning of Deep Ground Gas Wells

Groundshire Limited were commissioned by HCSL to decommission the existing (deep) ground gas and groundwater monitoring wells within the Phase 2 development area, so that they would not pose a risk to the future development by acting as preferential pathways.

The decommissioning was carried out by over-drilling the monitoring well pipework to prove bedrock at the bottom of the bottom of the borehole through rotary openhole drilling techniques. The works targeted monitoring wells that extended below the bottom of the cut formations (reduced digs). The works were carried out from 30 May to 1 July 2022 under the part-time supervision of JPG.

Logs and grouting records were prepared by Groundshire. These are presented in Appendix C of this report.

2.3 General Site Preparation & Earthworks

HCSL commenced on site by removing vegetation and stripping and stockpiling the topsoil.

Following the initial topsoil strip, HCSL excavated made ground to create level platforms in order to carry out dynamic deep compaction. Due to the sloping nature of the site, three terraced plateaus were constructed. These plateaus were sub-divided as Cut 2A1, 2A2 and 2A3 in order to allow the dynamic compaction to be carried out from a level working platform. HCSL commenced in the south of the site (Cut 2A3) and progressed in a northern direction.

HCSL stockpiled the capping clay and colliery spoil materials separately and removed oversize materials, which was later crushed and retained for re-use.

A 0.50m thick blanket of granular material (Class 6F5) was placed by HCSL on the dynamic compaction platforms.

Keller mobilised to site in early September 2022 and commenced dynamic compaction works across the platforms prepared by HCSL from 7 September 2022. The dynamic compaction works were completed by the beginning of January 2023.



Following the completion of the dynamic compaction and zone load tests across each cut, HCSL proceeded to re-profile the site to the required formation levels, utilising suitable excavated materials, in accordance with the specification.

HCSL appointed the UKAS accredited Exploration & Testing Associates Limited laboratory to undertake the on-site geotechnical testing.

Compaction trials were undertaken by Exploration & Testing Associates Limited on 20 September 2022. The results of the trials confirmed the suitability of the plant, layer thickness and number of passes, in accordance with the Series 600 Specification for Highway Works.

The fill materials were placed by excavation plant in layers approximately 300mm thick using GPS controlled plant and compacted using either Volvo or CAT self-propelled rollers.

Made ground previously identified to have elevated calorific values or identified during excavation to potentially have elevated calorific values (>2MJ/kg) was placed at deeper levels before finishing the top 1m with the previously excavated capping (brown) clay, which was stockpiled separately from the colliery spoil made ground (grey clay).

2.4 Verification of Contamination Status of Clean Cover Soils

The objective of the soil sampling and laboratory testing was to ensure that the shallow soils in future gardens and landscaped areas were suitable for the future residential with homegrown produce end use. The only contaminants of concern identified as part of previous geoenvironmental assessments were calorific value and locally arsenic. However, the samples recording elevated arsenic relate to colliery spoil at depth, recorded in exploratory holes located to the north of Phase 2A (CP203) and immediately beyond the south-eastern boundary (WS213).

Samples were obtained from the upper 1.00m of the shallow soils on a regular 50m grid across the Phase 2A development area and tested for calorific value as well as total organic carbon to ensure that no coal-rich, potentially combustible soils remain near the surface of the future development.

In total 56 soil samples were tested. Calorific value was found to range from <0.002MJ/kg to 0.0053MJ/kg. Soils with values below 2MJ/kg are unlikely to burn. Therefore, the testing has confirmed that no potentially combustible soils remain within the upper 1.00m.

In order to confirm the contamination status of the near surface soils post-earthworks, samples of topsoil and subsoil were obtained on an approximate 100m grid and tested for the determinands contained in Table 2 of the JPG Remedial Strategy, referenced 5162-JPG-P2-XX-RP-G-0612-S2-P02. The testing was carried out to ensure that the topsoil and subsoil present within the upper 0.60m was suitable to remain in future gardens.



In total 38 soil samples were tested by Chemtech Environmental Limited. The chemical test results have been compared against the threshold criteria contained in Table 2 of the Remedial Strategy. It should be noted that all samples with depths of between 0.00m and 0.30m consist of topsoil and samples below 0.30m comprise subsoil.

In total 38 samples were tested. When compared to screening values for a residential with homegrown produce end use, slight exceedances are present for lead.

The elevated lead concentration was recorded in sample reference LL5 at 0.30m bgl and comprised topsoil. The sample recorded a concentration of 204.2mg/kg very slightly above a screening level of 200mg/kg. Statistical analysis using ProUCL (version 5.2) has confirmed that 204.2mg/kg is a potential outlier at the 1%, 5% and 10% significance levels and is therefore considered anomalous. When the result for sample reference LL5 is removed from the dataset for topsoil results, a 95 percentile UCL of 45.34mg/kg is calculated.

The results of all chemical and related testing are included in Appendix F along with soil sample location plans.

2.5 Verification of Ground Gas Regime and Confirmation of Ground Gas Protection Requirements

Ground Gas Solutions (GGS) produced a Specification for monitoring ground gas following completion of the earthworks. This is referenced below:

- GGS. Ground Gas Verification Specification (Post-Earthworks), Phase 2 Development at Skelton Grange, Leeds. Report no. GGS3070GGVS01R1. Dated 18 August 2022. For Templegate Developments Limited.

The objective of the additional ground gas monitoring was to verify that the ground gas conditions on site were no worse than during previous investigations following the large-scale earthworks.

The monitoring wells were installed across the Phase 2A development area between 31 July and 1 August 2023. Periodic ground gas monitoring of the wells was carried out between 18 September and 16 October (three occasions). Continuous monitoring was carried out in 3 wells for three weeks between 25 September and 16 October 2023. In addition, a surface emission survey of the site and flux box tests were carried out on 18 October 2023. Groundwater samples were taken from two selected wells on 18 October 2023 and analysed for dissolved methane and carbon dioxide.

The results of the monitoring and testing referenced above is included in the GGS report, referenced below, and included in Appendix I of this report.

- GGS. Ground Gas Verification (Post-Earthworks), Phase 2A Development at Skelton Grange, Leeds. Report no. GGS3070GGV-P2AR1. Revision 1.0, dated 15 February 2024. For Templegate Developments Limited.



The above report includes an updated generic qualitative ground gas risk assessment and a detailed ground gas risk assessment to include an updated conceptual site model.

2.6 Decommissioning of Shallow Ground Gas Wells

The decommissioning of the shallow ground gas wells was carried out by HCSL, so that they would not pose a risk to the future development by acting as preferential pathways.

The decommissioning was carried out by drilling holes in the top of the HDPE pipe. A road pin was pushed through, and bagging used to hoist the pipe out of the ground using the forks of a 13-tonne tracked excavator. For some wells, the raised covers and pipework were removed at the same time as they had been well concreted in.

‘Swelltight’ bentonite granules were poured from the base of the hole to ground level and water was added to ensure that the boreholes were effectively sealed. The works were carried out on 15 March 2024 under the part-time supervision of JPG. Photographs are included in Appendix B.



3.0 CONCLUSION & RECOMMENDATIONS

3.1 Decommissioning of Deep Ground Gas Wells

Prior to the earthwork's operation, all deep ground gas wells were decommissioned across Phase 2 by over-drilling and grouting carried out by Groundshire. Logs, grouting records and a location plan for the works are included in Appendix C. A JPG engineer attended site to supervise the decommissioning operation.

3.2 Contamination Testing of Shallow Soils

Testing has confirmed that the topsoil is generally chemically suitable for use in future gardens and landscaping.

Extensive laboratory testing of the shallow soils (topsoil, subsoil and general fill) as part of the earthworks operation and also previous ground investigations indicates the materials are suitable for use on the proposed development, with no requirement for a clean cover system.

It is assumed that the housebuilder will place the existing topsoil into temporary stockpile during the house-building phase of the works. The housebuilder will be required to test the topsoil prior to final placement in gardens/landscaping to ensure that no cross contamination has occurred. This soil testing should be carried as per the JPG Remedial Strategy Report, referenced below, at a rate of 1 in 250m³.

- JPG. Residential Development within the Phase 2 Area. Skelton Gate, Leeds. Ref. 5162-JPG-P2-XX-G-0612-S2-P02 dated February 2022.

It is recommended that at least 150mm of topsoil is placed as a growing medium.

It is the housebuilder's responsibility to ensure that suitable soils (topsoil and subsoil) are placed in future gardens and public open space, to the satisfaction of the Local Authority. Care will be required during the earthworks to ensure that the subsoil ('brown capping clay') is not mixed with the underlying colliery spoil made ground ('grey clay') to avoid cross-contamination.

A Phase 2 Verification Report will be required to be submitted to the Local Authority by the housing developer to confirm that only suitable soils (topsoil and subsoil) have been placed in future gardens and landscaping). It is anticipated that further testing of both topsoil and subsoil as well as depth validation will be required as part of the further works, to be undertaken by the housing developer.

3.3 Ground Gas Protection Requirements

The post-earthworks ground gas risk assessment completed by GGS confirms that the appropriate classification for the Phase 2A development area is CS3 as per BS8485:2015+A1:2019. This classification represents a moderate hazard potential due to concentrations of methane and carbon dioxide and appropriate ground gas protection measures will be required.



The detailed design, construction and validation of gas protection measures will require approval by the NHBC and the local authority contaminated land officer prior to construction. The housing developer will be required to submit gas verification plans as part of reserved matters applications. These plans will be required to include:

Detailed gas protection design including site specific drawings:

- Specification of materials to be used.
- Who will install the membrane.
- Who will verify the protection measures, and
- A detailed verification plan.

In addition, the gas verification plans will need to outline measures on how it will be ensured that preferential pathways shall not be created, or significant excavation of the engineered platform does not occur during development works.

3.4 Decommissioning of Shallow Ground Gas Wells

The shallow ground gas wells were decommissioned on 15 March 2024 under the supervision of a JPG engineer. Validation photographs are included in Appendix B of this report.

3.5 Updated Conceptual Site Model

The conceptual site model developed as part of the JPG geoenvironmental ground investigation report has been updated to reflect the contamination status of the site post enabling/earthworks.

Sources

The following potential sources of contamination are considered to pose a risk to end users:

- Hazardous ground gases.

Pathways

Based on the proposed development of the site for residential end use including homegrown produce, the following potential exposure pathways will require consideration, both during the construction phase and in relation to the end use scenario:

- Inhalation of hazardous gases.
- Explosive risk.



Receptors

The potential receptors considered are:

- Construction workers and future maintenance workers involved in excavations, e.g. foundations or where services are being installed.
- Future site end users (including residents and the general public); and,
- The built environment.

3.6 Source –Pathway –Receptor Linkages

Based on the above sources, pathways and receptors, the following linkage assessments have been considered.

This assessment is based on current site conditions following enabling/earthworks.

Construction and Maintenance Workers

Based on the potential sources of contamination which have been identified on the site, there is a risk to construction and maintenance workers involved in groundworks at the site, predominantly owing to the potential for exposure to hazardous gases (methane and carbon dioxide).

Future Site End Users

Based on the potential sources of contamination which have been identified on the site, there will be a risk to site end users from exposure to hazardous gases.

3.7 Mitigation Measures

In order to mitigate the risks posed by the potential contaminants which have been identified on the site, consideration should be given to the following mitigation measures.

Construction and Maintenance Workers

In order to mitigate the risks posed by the potential contamination present on the site, consideration should be given to the following mitigation measures:

- Site workers involved in groundworks should take the necessary measures to ensure that all works in excavations and confined spaces are carried out in accordance with best practice in order to prevent exposure to potentially hazardous gases.
- Site workers involved in groundworks should use appropriate PPE, i.e. overalls and gloves and wear appropriate facemasks. Appropriate health and safety measures, e.g. washing hands prior to eating or drinking, should also be enforced.



During development of the site, all workers should remain vigilant to the possible risk of encountering areas of potentially contaminated material. Should potentially contaminated material be encountered, site management should be informed. Further testing may then be required to assess the risk to health and safety of the site workers and the environment.

All employers involved in works at the site should produce an appropriate method statement and risk assessment, to which all employees should comply. Reference should also be made to appropriate HSE and other guidance for working on contaminated and potentially contaminated sites.

Future Site Users

Ground gas protection measures for methane and carbon dioxide are required in new buildings constructed on the site.

Ground gas protection measures should be designed in accordance with BS8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

The gas protection systems will require verification in accordance with the guidance provided in the Yorkshire and Lincolnshire Pollution Advisory Group's (YALPAG) document '*Verification Requirements for Gas Protection Systems, Technical Guidance for Developers, Landowners and Consultants*', Version 1.1: December 2016, and C735: 2014 '*Good practice on the testing and verification of protection systems for buildings against hazardous ground gases*'.

Once the gas protection system has been installed a verification report will need to be submitted to the Local Planning Authority for approval.



Appendix A Figures and Drawings

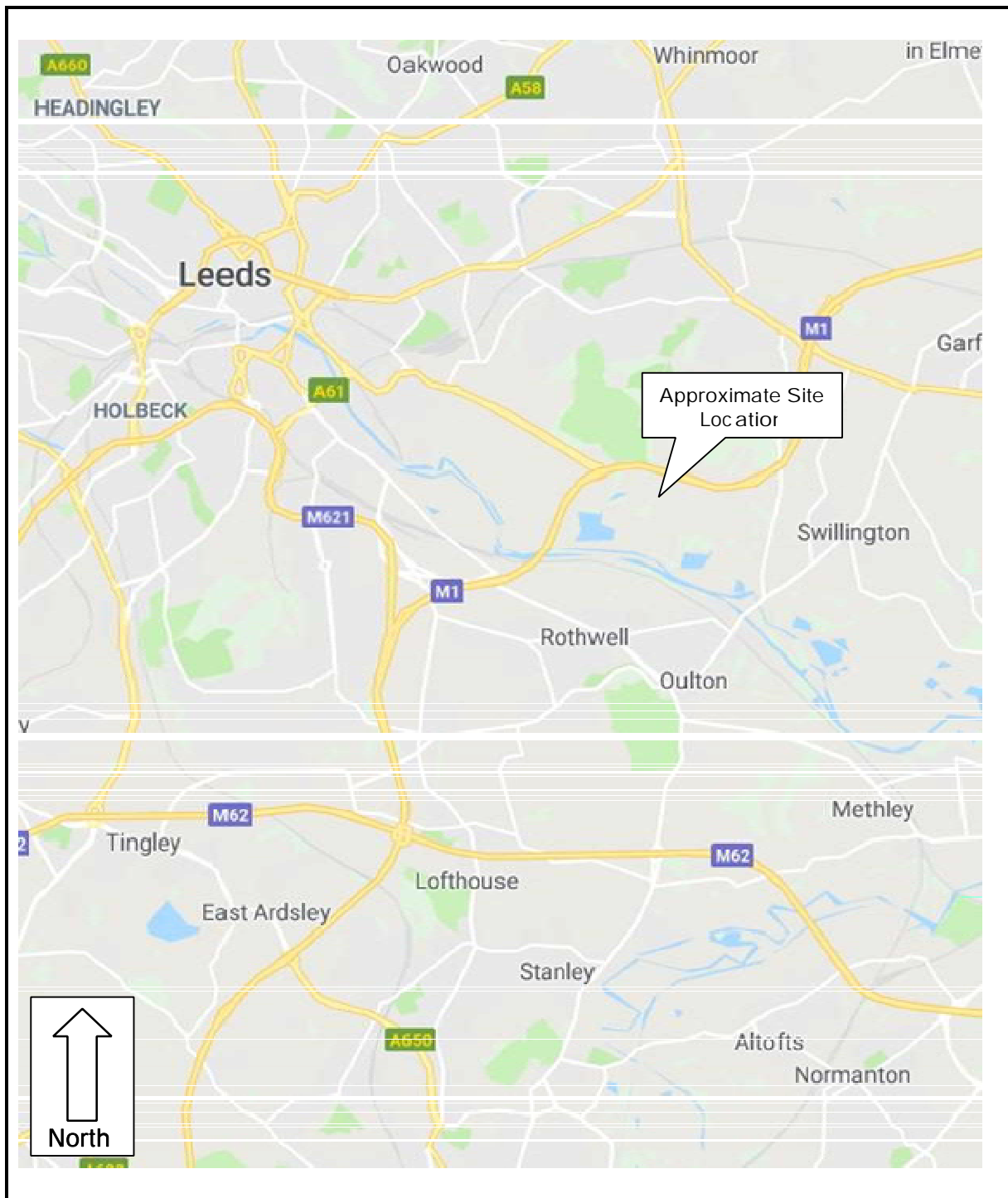


Figure 1 –Site Location Plan	
Site	Phase 2A Development Area, Skelton Gate, Leeds
Client	Templegate Developments Limited
Job Number	5162
Scale	NTS



Figure 2 –Aerial Photograph	
Site	Phase 2A Development Area, Skelton Gate, Leeds
Client	Templegate Developments Ltd
Job Number	5162
Scale	NTS



Appendix B Photographic Records



Photograph 1 –Topsoil Strip



Photograph 2 –Excavating the Cuts to Dynamic Compaction Level



Photograph 3 -Dynamic Compaction Platform on Cut 2B3



Photograph 4 –Temporary Drainage Channels to Allow Works to Continue During Wet Weather



Photograph 5 –Dynamic Compaction



**Photograph 6 –Trial Pits to Obtain Representative Soil Samples for
Laboratory Classification**



Photograph 7 –Earthworks: Engineering of Class 2C Materials



Photograph 8 –Earthworks



**Photograph 9 –Earthworks: Validation Testing on Compacted Layers
(Sand Replacement Test)**



Photograph 10 –Crushing of Sandstone Boulders



**Photograph 11 –Replacement of Topsoil, Excluding area
for Pedestrian Bridge Construction**



Photograph 12 – Trial Pits for Chemical Validation on 50m Grid.



**Photograph 13 –Installation of Monitoring Wells for Post Earthworks
Continuous Gas Monitoring**



Photograph 14 –Decommissioning of Shallow Gas Monitoring Wells



Photograph 15 –Decommissioning of Shallow Ground Gas Wells

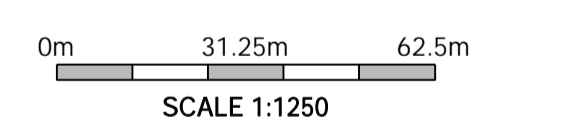


Appendix C Decommissioning of Phase 2A Deep Monitoring Wells (Drillhole Records, Grout Records & Location Plan)

JPG MONITORING WELL INVESTIGATION

CP201 MONITORING WELL LOCATIONS

NOTE: POINTS CP203, CP207 AND RO202 HAVE BEEN REMOVED FROM PLAN DUE NOT BEING LOCATED INSIDE RESIDENTIAL PLOT BOUNDARIES.



C01	CONSTRUCTION ISSUE	01.06.22	CPH	JAC
P01	FIRST ISSUE	31.01.22	JMW	AJB
REV	DESCRIPTION	DATE	CHK	BY

Project
 SKELTON GRANGE,
 JUNCTION 45 - M1,
 LEEDS

Drawing Title
 MONITORING WELL DECOMMISSIONING
 PLAN

CONSTRUCTION



DAILY DRILLING RETURNS

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

CLIENT Hall Construction

SHEET NO.

1

Hole No	Total Depth	Casing Depth	Date	Driller	Depth From	Depth To	STRATA	Hole No	Total Depth	Casing Depth	Date	Driller	Depth From	Depth To	STRATA								
CP211	26.00		30.5.22	AC	0.00	25.00	WELL	CP209	31.00		6.6.22	AC	0.00	30.00	WELL								
					25.00	26.00	SOLID						30.00	31.00	SOLID								
Decommissioned Well								Decommissioned Well															
CP210	16.00		31.5.22	AC	0.00	15.00	WELL	CP215	10.00		7.6.22	AC	0.00	9.00	WELL								
					15.00	16.00	SOLID						9.00	10.00	SOLID								
Decommissioned Well								Decommissioned Well															
CP208	19.00		1.6.22	AC	0.00	18.00	WELL	CP213	14.00		8.6.22	AC	0.00	13.60	WELL								
					18.00	19.00	SOLID						13.60	14.00	SOLID								
Decommissioned Well								Decommissioned Well															
DRILLING METRES				CASING METRES				HOLES DRILLED				STRATA ENCOUNTERED											
PAGE TOTAL		116.00		PAGE TOTAL		0.00		HOLES		6		COAL		0		B/G		0		VOID		0	
PREV. TOTAL		0.00		PREV. TOTAL		0.00		PREVIOUS HOLES		0		COAL		0		B/G		0		VOID		0	
RUN. TOTAL		116.00		RUN. TOTAL		0.00		TOTAL HOLES		6		COAL		0		B/G		0		VOID		0	

C8B

DAILY GROUTING RETURNS

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

CLIENT Hall Construction

SHEET NO. 1.000

DATE 31.5.22

GROUNDSH RE
GROUNDSHIRE
GROUNDSHIRE
GROUNDSHIRE
I

MIX

QUANTITIES USED (TONNES)						
HOLE NO.		BENTONITE			INCOMPLETE	COMP / PSI
CP211		0.025				1.00
CP210		0.025				1.00
PAGE TOTAL		0.050			COMPLETE	2.00
PREV. TOTAL		0.000			PREV. COMP.	0.00
RUN. TOTAL		0.050			TOTAL COMP.	2.00

DELIVERIES (TONNES)				
	BENTONITE	P.F.A.	SAND	GRAVEL
TODAYS DELIVERIES	2.000			
PREVIOUS DELIVERIES	0.000	0.00	0.00	0.00
TOTAL DELIVERIES	2.000	0.00	0.00	0.00
TOTAL USED	0.050	0.00	0.00	0.00
STOCK ON SITE	1.950	0.00	0.00	0.00

TICKET NUMBERS / CUBES / REMARKS
BENTONITE <div style="text-align: center;">2.000</div> 1 BAG OF BENTO IS 0.025 TONNE

C8B

DAILY GROUTING RETURNS

SHEET NO. 3.000

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

DATE 6.6.22

CLIENT Hall Construction

MIX 0.000

GROUNDSH RE
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 GROUNDSHIRE
 GROUNDSHIRE
 I

QUANTITIES USED (TONNES)						
HOLE NO.		BENTONITE			INCOMPLETE	COMP / PSI
CP209		0.050				1.00
PAGE TOTAL		0.050			COMPLETE	1.00
PREV. TOTAL		0.075			PREV. COMP.	3.00
RUN. TOTAL		0.125			TOTAL COMP.	4.00

DELIVERIES (TONNES)				
	BENTONITE	P.F.A.	SAND	GRAVEL
TODAYS DELIVERIES				
PREVIOUS DELIVERIES	2.000	0.00	0.00	0.00
TOTAL DELIVERIES	2.000	0.00	0.00	0.00
TOTAL USED	0.125	0.00	0.00	0.00
STOCK ON SITE	1.875	0.00	0.00	0.00

TICKET NUMBERS / CUBES / REMARKS

C8B

DAILY GROUTING RETURNS

SHEET NO. 5.000

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

DATE 8.6.22

CLIENT Hall Construction

MIX 0.000

GROUND SH RE
GROUND SHIRE
GROUND SHIRE
GROUND SHIRE
I

QUANTITIES USED (TONNES)						
HOLE NO.		BENTONITE			INCOMPLETE	COMP / PSI
CP213		0.025				1.00
PAGE TOTAL		0.025			COMPLETE	1.00
PREV. TOTAL		0.150			PREV. COMP.	5.00
RUN. TOTAL		0.175			TOTAL COMP.	6.00

DELIVERIES (TONNES)				
	BENTONITE	P.F.A.	SAND	GRAVEL
TODAYS DELIVERIES				
PREVIOUS DELIVERIES	2.000	0.00	0.00	0.00
TOTAL DELIVERIES	2.000	0.00	0.00	0.00
TOTAL USED	0.175	0.00	0.00	0.00
STOCK ON SITE	1.825	0.00	0.00	0.00

TICKET NUMBERS / CUBES / REMARKS

C8B

DAILY GROUTING RETURNS

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

CLIENT Hall Construction

SHEET NO. 6.000

DATE 29.6.22

MIX 0.000

GROUND SH RE
GROUND SHIRE
GROUND SHIRE
GROUND SHIRE
I

QUANTITIES USED (TONNES)							
HOLE NO.		BENTONITE				INCOMPLETE	COMP / PSI
CP201		0.025					1.00
PAGE TOTAL		0.025				COMPLETE	1.00
PREV. TOTAL		0.175				PREV. COMP.	6.00
RUN. TOTAL		0.200				TOTAL COMP.	7.00

DELIVERIES (TONNES)				
	BENTONITE	P.F.A.	SAND	GRAVEL
TODAYS DELIVERIES				
PREVIOUS DELIVERIES	2.000	0.00	0.00	0.00
TOTAL DELIVERIES	2.000	0.00	0.00	0.00
TOTAL USED	0.200	0.00	0.00	0.00
STOCK ON SITE	1.800	0.00	0.00	0.00

TICKET NUMBERS / CUBES / REMARKS

C8B

DAILY GROUTING RETURNS

SHEET NO. 7.000

SITE 13559 - Skelton Grange, Leeds, LS15 9AD

DATE 30.6.22

CLIENT Hall Construction

MIX 0.000

GROUND SH RE
 GROUND SHIRE
 GROUND SHIRE
 GROUND SHIRE
 I

QUANTITIES USED (TONNES)						
HOLE NO.		BENTONITE			INCOMPLETE	COMP / PSI
CP204		0.025				1.00
PAGE TOTAL		0.025			COMPLETE	1.00
PREV. TOTAL		0.200			PREV. COMP.	7.00
RUN. TOTAL		0.225			TOTAL COMP.	8.00

DELIVERIES (TONNES)				
	BENTONITE	P.F.A.	SAND	GRAVEL
TODAYS DELIVERIES				
PREVIOUS DELIVERIES	2.000	0.00	0.00	0.00
TOTAL DELIVERIES	2.000	0.00	0.00	0.00
TOTAL USED	0.225	0.00	0.00	0.00
STOCK ON SITE	1.775	0.00	0.00	0.00

TICKET NUMBERS / CUBES / REMARKS



Appendix D Post Earthworks Chemical Test Results & Sample Location Grids (50m & 100m)

ANALYTICAL TEST REPORT

Contract no: 119854

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Construction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 02 March 2023

Analysis started: 02 March 2023

Analysis completed: 09 March 2023

Report issued: 09 March 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			119854-1	119854-2	119854-3	119854-4	119854-5	119854-6
Sample id			CC7	CC7	DD7	DD7	EE6	EE6
Depth (m)			0.30	0.60	0.50	1.00	0.30	0.60
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.3	4.1	3.6	7.2	15.6	6.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-7	119854-8	119854-9	119854-10	119854-11	119854-12
Sample id			EE7	EE7	FF6	FF6	FF7	FF7
Depth (m)			0.40	1.00	0.20	0.90	0.50	0.80
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.5	8.3	1.1	1.6	1.8	1.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-13	119854-14	119854-15	119854-16	119854-17	119854-18
Sample id			GG5	GG5	GG6	GG6	II6	II6
Depth (m)			0.40	0.60	0.60	1.00	0.10	0.70
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	1.9	2.3	2.0	5.9	7.2	3.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-19	119854-20
Sample id			JJ6	JJ6
Depth (m)			0.40	0.70
Date sampled			01/03/2023	01/03/2023
Test	Method	Units		
Total Organic Carbon (TOC)	CE197	% w/w C	2.5	3.2
Subcontracted analysis				
Calorific value	\$	kJ/kg	<2	<2

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Combustion, Carbon analyser	Dry		100	kJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

ANALYTICAL TEST REPORT

Contract no: 119854

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Construction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 02 March 2023

Analysis started: 02 March 2023

Analysis completed: 09 March 2023

Report issued: 09 March 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			119854-1	119854-2	119854-3	119854-4	119854-5	119854-6
Sample id			CC7	CC7	DD7	DD7	EE6	EE6
Depth (m)			0.30	0.60	0.50	1.00	0.30	0.60
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.3	4.1	3.6	7.2	15.6	6.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-7	119854-8	119854-9	119854-10	119854-11	119854-12
Sample id			EE7	EE7	FF6	FF6	FF7	FF7
Depth (m)			0.40	1.00	0.20	0.90	0.50	0.80
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.5	8.3	1.1	1.6	1.8	1.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-13	119854-14	119854-15	119854-16	119854-17	119854-18
Sample id			GG5	GG5	GG6	GG6	II6	II6
Depth (m)			0.40	0.60	0.60	1.00	0.10	0.70
Date sampled			01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	1.9	2.3	2.0	5.9	7.2	3.6
Subcontracted analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			119854-19	119854-20
Sample id			JJ6	JJ6
Depth (m)			0.40	0.70
Date sampled			01/03/2023	01/03/2023
Test	Method	Units		
Total Organic Carbon (TOC)	CE197	% w/w C	2.5	3.2
Subcontracted analysis				
Calorific value	\$	kJ/kg	<2	<2

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Combustion, Carbon analyser	Dry		100	kJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

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All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

ANALYTICAL TEST REPORT

Contract no: 124446

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Construction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 05 July 2023

Analysis started: 05 July 2023

Analysis completed: 12 July 2023

Report issued: 12 July 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing
- NAD No Asbestos Detected

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number	124446-1	124446-2	124446-3	124446-4	124446-5	124446-6		
Sample id	BB5	BB5	CC5	CC5	CC6	CC6		
Depth (m)	0.30	0.60	0.20	0.50	0.40	1.00		
Date sampled	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023		
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.9	3.2	3.7	2.6	5.3	2.7
Subcontracted analysis								
Calorific value	\$	MJ/kg	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Chemtech Environmental Limited

SOILS

Lab number			124446-7	124446-8	124446-9	124446-10	124446-11	124446-12
Sample id			BB6	BB6	BB7	BB7	DD5	DD5
Depth (m)			0.10	0.90	0.20	0.70	0.10	0.60
Date sampled			30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	3.6	2.3	2.8	3.7	2.7	3.6
Subcontracted analysis								
Calorific value	\$	MJ/kg	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Bomb Calorimeter	Dry		2	MJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

ANALYTICAL TEST REPORT

Contract no: 127624

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Construction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 18 October 2023

Analysis started: 18 October 2023

Analysis completed: 27 October 2023

Report issued: 27 October 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number	127624-1	127624-2	127624-3	127624-4	127624-5	127624-6		
Sample id	BB6BB7	BB7	CC6	DD6	EE5	FF5		
Depth (mm)	200.00	500.00	500.00	200.00	100.00	100.00		
Date sampled	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023		
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	3.8	3.9	3.8	2.9	3.1
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	<2	3.2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			127624-7	127624-8	127624-9	127624-10	127624-11	127624-12
Sample id			GG7	II5	JJ5	KK4	KK5	KK6
Depth (mm)			300.00	400.00	400.00	300.00	200.00	400.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	3.1	2.1	2.0	2.5	4.1	2.4
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	2.7	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			127624-13	127624-14	127624-15
Sample id			LL3	LL4	LL5
Depth (mm)			400.00	200.00	300.00
Date sampled			17/10/2023	17/10/2023	17/10/2023
Test	Method	Units			
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	3.6	2.9
Subcontracted Analysis					
Calorific value	\$	kJ/kg	<2	3.2	5.3

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Bomb Calorimeter	Dry		2	kJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

ANALYTICAL TEST REPORT

Contract no: 127625

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Constuction Services

Clients address: Stotforth Hill House
Windlestone, rushyford
County Durham
DL17 0NF

Samples received: 18 October 2023

Analysis started: 18 October 2023

Analysis completed: 27 October 2023

Report issued: 27 October 2023

Key

U UKAS accredited test

M MCERTS & UKAS accredited test

\$ Test carried out by an approved subcontractor

I/S Insufficient sample to carry out test

N/S Sample not suitable for testing

NAD No Asbestos Detected

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127625-1	127625-2	127625-3	127625-4	127625-5	127625-6
Sample id			BB5	BB5	CC5	CC5	DD5	DD5
Depth (mm)			200.00	600.00	400.00	300.00	300.00	500.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	3.1	2.1	3.2	2.8	1.8	2.7
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	<2	4.2	<2

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Bomb Calorimeter	Dry		2	kJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

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Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

ANALYTICAL TEST REPORT

Contract no: 127626

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Constuction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 18 October 2023

Analysis started: 18 October 2023

Analysis completed: 27 October 2023

Report issued: 27 October 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing
- NAD No Asbestos Detected

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127626-1	127626-2	127626-3	127626-4	127626-5	127626-6
Sample id			BB6	BB7	CC6	DD6	EE5	FF5
Depth (mm)			900	600	700	900	700	700
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	3.0	3.2	2.7	3.2	3.2	5.0
Subcontracted Analysis								
Calorific value	\$	kJ/kg	2.5	<2	5.3	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			127626-7	127626-8	127626-9	127626-10	127626-11	127626-12
Sample id			GG7	II5	JJ5	KK4	KK5	KK6
Depth (mm)			900	700	500	500	700	800
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	2.7	3.0	3.1	2.5	2.6	2.4
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	3.2	<2	<2	<2	<2

Chemtech Environmental Limited

SOILS

Lab number			127626-13	127626-14	127626-15
Sample id			LL3	LL4	LL5
Depth (mm)			800	900	1000
Date sampled			17/10/2023	17/10/2023	17/10/2023
Test	Method	Units			
Total Organic Carbon (TOC)	CE197	% w/w C	3.3	3.4	3.0
Subcontracted Analysis					
Calorific value	\$	kJ/kg	<2	<2	<2

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
\$	Calorific value	Bomb Calorimeter	Dry		2	kJ/kg

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis



ANALYTICAL TEST REPORT

Contract no: 127627

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Constuction

Clients address: Stotforth Hill House
Windlestone, Rushyford
Country Durham
DL17 0NF

Samples received: 18 October 2023

Analysis started: 18 October 2023

Analysis completed: 30 October 2023

Report issued: 30 October 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing
- NAD No Asbestos Detected

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
127627-1	C3	0.20	Sady Loamy Clay with Gravel & Roots	-	-	15.3
127627-2	C3	0.60	Sandy Clay with Gravel & Roots	-	-	8
127627-3	C4	0.20	Sandy Loamy Clay with Gravel & Roots	-	-	16.2
127627-4	C4	0.50	Sandy Loamy Clay with Gravel & Roots	-	-	11.6
127627-5	D3	0.10	Sandy Loamy Clay with Gravel & Roots	-	-	11.5
127627-6	D3	0.50	Sandy Clayey Loam with Gravel & Roots	-	-	10.6
127627-7	D4	0.20	Sandy Clay with Gravel	-	-	15.2
127627-8	D4	0.50	Sandy Clayey Loam with Gravel & Roots	-	-	14.1
127627-9	E3	0.20	Sandy Clayey Loam with Gravel & Roots	-	-	14.6
127627-10	E3	0.40	Sandy Clay with Gravel	-	-	11.6
127627-11	F3	0.80	Sandy Clayey Loam with Gravel & Roots	-	-	14.4
127627-12	F3	0.50	Sandy Clay	-	-	16.5
127627-13	G3	0.20	Sandy Loamy Clay with Gravel & Roots	-	-	14.7
127627-14	G3	0.40	Sandy Loamy Clay with Gravel & Roots	-	-	14

Chemtech Environmental Limited

SOILS

Lab number			127627-1	127627-2	127627-3	127627-4	127627-5	127627-6
Sample id			C3	C3	C4	C4	D3	D3
Depth (mm)			200	600	200	500	100	500
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Arsenic (total)	CE264 ^M	mg/kg As	12.6	10.4	13.0	9.4	10.9	11.3
Cadmium (total)	CE264 ^M	mg/kg Cd	2.3	2.2	2.5	2.1	2.3	2.3
Chromium (total)	CE264 ^U	mg/kg Cr	51.7	36.4	51.0	34.7	35.8	47.1
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE264 ^M	mg/kg Cu	44.6	31.8	42.4	34.7	32.1	36.6
Lead (total)	CE264 ^U	mg/kg Pb	55.8	30.7	55.6	30.7	28.7	48.6
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2	<2	<2	<2	<2
Nickel (total)	CE264 ^M	mg/kg Ni	27.5	34.4	30.6	38.8	36.7	28.3
Selenium (total)	CE264	mg/kg Se	<3	<3	<3	<3	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	136.2	104.6	140.2	120.9	112.0	118.9
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.5	2.8	2.8	2.3	2.4	2.4
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.4	4.8	4.7	4.0	4.1	4.1
PAH								
Naphthalene	CE087 ^M	mg/kg	0.98	0.20	0.28	0.27	0.30	0.15
Acenaphthylene	CE087 ^M	mg/kg	0.07	<0.02	0.06	<0.02	0.08	0.03
Acenaphthene	CE087 ^M	mg/kg	0.07	0.05	0.08	0.06	0.12	0.06
Fluorene	CE087 ^U	mg/kg	0.06	0.07	0.07	0.06	0.13	0.07
Phenanthrene	CE087 ^M	mg/kg	0.85	0.46	0.72	0.53	1.23	0.38
Anthracene	CE087 ^U	mg/kg	0.25	0.08	0.18	0.12	0.33	0.13
Fluoranthene	CE087 ^M	mg/kg	1.52	0.25	1.32	0.32	1.53	0.54
Pyrene	CE087 ^M	mg/kg	1.39	0.23	1.29	0.29	1.35	0.51
Benzo(a)anthracene	CE087 ^U	mg/kg	0.98	0.13	0.81	0.17	0.87	0.42
Chrysene	CE087 ^M	mg/kg	1.12	0.16	0.93	0.20	0.96	0.41
Benzo(b)fluoranthene	CE087 ^M	mg/kg	1.06	0.14	0.86	0.16	0.92	0.33
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.46	0.05	0.38	0.06	0.39	0.39
Benzo(a)pyrene	CE087 ^U	mg/kg	1.09	0.12	1.01	0.15	0.89	0.34
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.66	0.08	0.52	0.08	0.45	0.17
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.15	0.02	0.12	0.02	0.11	0.03
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.67	0.11	0.54	0.12	0.53	0.18
PAH (total of USEPA 16)	CE087	mg/kg	11.4	2.13	9.17	2.63	10.2	4.13
TPH								
VPH Aliphatic (>C5-C6)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aliphatic (>C6-C8)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aliphatic (>C8-C10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
VPH Aromatic (>EC5-EC7)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aromatic (>EC7-EC8)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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SOILS

Lab number			127627-1	127627-2	127627-3	127627-4	127627-5	127627-6
Sample id			C3	C3	C4	C4	D3	D3
Depth (mm)			200	600	200	500	100	500
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
VPH Aromatic (>EC8-EC10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	<1	<1	<1	22	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1	<1	<1	<1	<1
Subcontracted Analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			127627-7	127627-8	127627-9	127627-10	127627-11	127627-12
Sample id			D4	D4	E3	E3	F3	F3
Depth (mm)			200	500	200	400	300	500
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Arsenic (total)	CE264 ^M	mg/kg As	13.2	14.8	14.7	9.4	12.9	10.4
Cadmium (total)	CE264 ^M	mg/kg Cd	2.3	2.3	2.7	2.6	2.7	<2
Chromium (total)	CE264 ^U	mg/kg Cr	36.0	49.4	55.8	35.2	50.1	31.1
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE264 ^M	mg/kg Cu	35.3	42.8	43.4	33.9	41.8	32.3
Lead (total)	CE264 ^U	mg/kg Pb	33.8	51.9	57.3	27.4	51.0	26.3
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2	<2	<2	<2	<2
Nickel (total)	CE264 ^M	mg/kg Ni	37.6	28.4	30.8	41.4	31.0	36.6
Selenium (total)	CE264	mg/kg Se	<3	<3	<3	<3	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	105.3	126.2	137.6	113.1	138.7	104.9
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	2.6	2.5	3.1	2.5	2.9
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.4	4.5	4.3	5.4	4.4	5.0
PAH								
Naphthalene	CE087 ^M	mg/kg	0.39	0.14	0.42	0.79	0.37	0.19
Acenaphthylene	CE087 ^M	mg/kg	0.11	<0.02	0.06	<0.02	0.05	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.07	0.04	0.13	0.07	0.09	0.04
Fluorene	CE087 ^U	mg/kg	0.07	0.05	0.12	0.13	0.09	0.05
Phenanthrene	CE087 ^M	mg/kg	0.82	0.31	1.34	0.54	0.99	0.42
Anthracene	CE087 ^U	mg/kg	0.33	0.14	0.44	0.14	0.26	0.08
Fluoranthene	CE087 ^M	mg/kg	1.22	0.31	2.09	0.17	1.59	0.53
Pyrene	CE087 ^M	mg/kg	1.15	0.28	1.89	0.15	1.40	0.49
Benzo(a)anthracene	CE087 ^U	mg/kg	0.84	0.20	1.17	0.11	0.85	0.28
Chrysene	CE087 ^M	mg/kg	0.78	0.21	1.34	0.11	0.93	0.29
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.93	0.17	1.23	0.08	0.86	0.26
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.37	0.08	0.52	0.04	0.36	0.10
Benzo(a)pyrene	CE087 ^U	mg/kg	0.94	0.20	1.28	0.09	0.82	0.21
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.50	0.10	0.68	0.04	0.43	0.13
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.13	0.03	0.13	<0.02	0.10	0.03
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.57	0.12	0.79	0.06	0.50	0.15
PAH (total of USEPA 16)	CE087	mg/kg	9.20	2.39	13.6	2.52	9.71	3.25
TPH								
VPH Aliphatic (>C5-C6)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aliphatic (>C6-C8)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aliphatic (>C8-C10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
VPH Aromatic (>EC5-EC7)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH Aromatic (>EC7-EC8)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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SOILS

Lab number			127627-7	127627-8	127627-9	127627-10	127627-11	127627-12
Sample id			D4	D4	E3	E3	F3	F3
Depth (mm)			200	500	200	400	300	500
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
VPH Aromatic (>EC8-EC10)	\$	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	<1	<1	<1	26	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1	<1	<1	15	<1
Subcontracted Analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			127627-13	127627-14
Sample id			G3	G3
Depth (mm)			200	400
Date sampled			17/10/2023	17/10/2023
Test	Method	Units		
Arsenic (total)	CE264 ^M	mg/kg As	13.3	13.3
Cadmium (total)	CE264 ^M	mg/kg Cd	3.4	2.0
Chromium (total)	CE264 ^U	mg/kg Cr	50.5	30.0
Chromium (VI)	CE146	mg/kg CrVI	<1	<1
Copper (total)	CE264 ^M	mg/kg Cu	41.1	31.2
Lead (total)	CE264 ^U	mg/kg Pb	56.4	31.0
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2
Nickel (total)	CE264 ^M	mg/kg Ni	33.1	33.7
Selenium (total)	CE264	mg/kg Se	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	135.8	99.5
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	2.4
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.5	4.2
PAH				
Naphthalene	CE087 ^M	mg/kg	0.28	1.03
Acenaphthylene	CE087 ^M	mg/kg	0.07	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.14	0.03
Fluorene	CE087 ^U	mg/kg	0.12	0.04
Phenanthrene	CE087 ^M	mg/kg	1.33	0.41
Anthracene	CE087 ^U	mg/kg	0.38	0.08
Fluoranthene	CE087 ^M	mg/kg	2.23	0.18
Pyrene	CE087 ^M	mg/kg	1.97	0.17
Benzo(a)anthracene	CE087 ^U	mg/kg	1.09	0.12
Chrysene	CE087 ^M	mg/kg	1.14	0.12
Benzo(b)fluoranthene	CE087 ^M	mg/kg	1.04	0.09
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.48	0.04
Benzo(a)pyrene	CE087 ^U	mg/kg	1.17	0.09
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.55	0.06
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.12	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.66	0.07
PAH (total of USEPA 16)	CE087	mg/kg	12.8	2.51
TPH				
VPH Aliphatic (>C5-C6)	\$	mg/kg	<0.05	<0.05
VPH Aliphatic (>C6-C8)	\$	mg/kg	<0.05	<0.05
VPH Aliphatic (>C8-C10)	\$	mg/kg	<0.05	<0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10
VPH Aromatic (>EC5-EC7)	\$	mg/kg	<0.05	<0.05
VPH Aromatic (>EC7-EC8)	\$	mg/kg	<0.05	<0.05

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SOILS

Lab number			127627-13	127627-14
Sample id			G3	G3
Depth (mm)			200	400
Date sampled			17/10/2023	17/10/2023
Test	Method	Units		
VPH Aromatic (>EC8-EC10)	\$	mg/kg	<0.05	<0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1
Subcontracted Analysis				
Asbestos (qualitative)	\$	-	NAD	NAD

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE264	Arsenic (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg As
CE264	Cadmium (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cd
CE264	Chromium (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Cr
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE264	Copper (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cu
CE264	Lead (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Pb
CE264	Mercury (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Hg
CE264	Nickel (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg Ni
CE264	Selenium (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Se
CE264	Zinc (total)	Aqua Regia Extraction, ICPOES	Dry	M	4	mg/kg Zn
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	As received		0.5	mg/kg PhOH
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
\$	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received	U	0.05	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
\$	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received	U	0.05	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127627-1	C3	0.20	N	-
127627-2	C3	0.60	N	-
127627-3	C4	0.20	N	-
127627-4	C4	0.50	N	-
127627-5	D3	0.10	N	-
127627-6	D3	0.50	N	-
127627-7	D4	0.20	N	-
127627-8	D4	0.50	N	-
127627-9	E3	0.20	N	-
127627-10	E3	0.40	N	-
127627-11	F3	0.80	N	-
127627-12	F3	0.50	N	-
127627-13	G3	0.20	N	-
127627-14	G3	0.40	N	-

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis



ANALYTICAL TEST REPORT

Contract no: 127624(1)

Contract name: Skelton Gate

Client reference: -

Clients name: Hall Construction

Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF

Samples received: 18 October 2023

Analysis started: 18 October 2023

Analysis completed: 10 November 2023

Report issued: 10 November 2023

This is a supplementary report to report number 127624 issued 27 October 2023.

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:

Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
127624-1	BB6	0.20	Sandy Clay with Gravel	-	-	9.9
127624-2	BB7	0.50	Sandy Clay with Gravel	-	-	9.4
127624-3	CC6	0.50	Sandy Clay with Gravel	-	-	7.4
127624-4	DD6	0.20	Sandy Clay with Gravel	-	-	10.0
127624-5	EE5	0.10	Sandy Clay with Gravel	-	-	12.8
127624-6	FF5	0.10	Sandy Clay with Gravel	-	-	12.1
127624-7	GG7	0.30	Sandy Clay with Gravel	-	-	14.5
127624-8	II5	0.40	Sandy Clay with Gravel	-	-	16.0
127624-9	JJ5	0.40	Sandy Clayey Loam with Gravel & Roots	-	-	14.6
127624-10	KK4	0.30	Clayey Loam with Gravel	-	-	9.4
127624-11	KK5	0.20	Sandy Clay with Gravel	-	-	14.2
127624-12	KK6	0.40	Sandy Clay with Roots	-	-	14.1
127624-13	LL3	0.40	Sandy Clay with Gravel & Roots	-	-	9.2
127624-14	LL4	0.20	Sandy Clay with Gravel & Roots	-	-	9.3
127624-15	LL5	0.30	Clay with Roots	-	-	16.0

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SOILS

Lab number			127624-1	127624-2	127624-3	127624-4	127624-5	127624-6
Sample id			BB6BB7	BB7	CC6	DD6	EE5	FF5
Depth (mm)			200.00	500.00	500.00	200.00	100.00	100.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Arsenic (total)	CE264 ^M	mg/kg As	9.8	9.9	9.5	14.2	12.7	8.3
Cadmium (total)	CE264 ^M	mg/kg Cd	<2	<2	<2	<2	<2	<2
Chromium (total)	CE264 ^U	mg/kg Cr	31.4	30.7	29.4	30.6	29.8	27.8
Chromium (VI)	CE263	mg/kg CrVI	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Copper (total)	CE264 ^M	mg/kg Cu	30.3	31.9	27.9	32.5	32.7	29.6
Lead (total)	CE264 ^U	mg/kg Pb	25.5	23.4	21.6	22.9	36.5	21.7
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2	<2	<2	<2	<2
Nickel (total)	CE264 ^M	mg/kg Ni	35.9	40.5	35.9	40.2	45.7	42.0
Selenium (total)	CE264	mg/kg Se	<3	<3	<3	<3	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	96.4	94.4	89.0	97.1	95.0	97.0
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	3.8	3.9	3.8	2.9	3.1
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.5	6.6	6.7	6.6	5.0	5.4
PAH								
Naphthalene	CE087 ^M	mg/kg	0.15	0.07	0.18	0.07	0.07	0.09
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.04	0.03	0.04	<0.02	<0.02	0.09
Fluorene	CE087 ^U	mg/kg	0.05	0.03	0.06	0.03	0.03	0.10
Phenanthrene	CE087 ^M	mg/kg	0.38	0.18	0.40	0.22	0.20	0.78
Anthracene	CE087 ^U	mg/kg	0.11	0.07	0.11	<0.02	0.04	0.25
Fluoranthene	CE087 ^M	mg/kg	0.25	0.10	0.36	0.04	0.11	0.62
Pyrene	CE087 ^M	mg/kg	0.24	0.10	0.33	0.05	0.10	0.52
Benzo(a)anthracene	CE087 ^U	mg/kg	0.14	0.07	0.20	0.03	0.06	0.27
Chrysene	CE087 ^M	mg/kg	0.13	0.08	0.22	<0.03	0.06	0.29
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.17	0.08	0.22	0.02	0.06	0.27
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.06	0.04	0.10	<0.03	0.03	0.09
Benzo(a)pyrene	CE087 ^U	mg/kg	0.14	0.06	0.18	<0.02	0.04	0.22
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.08	0.03	0.10	<0.02	0.02	0.12
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.12	0.06	0.13	0.02	0.04	0.14
PAH (total of USEPA 16)	CE087	mg/kg	2.07	1.02	2.63	0.48	0.86	3.88
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	1	6	2	1	1	<0.5
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	3	14	5	4	<1	1
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	3	8	6	4	<2	<2
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<5	12	10	<5	<5	<5
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1.5	3	3	<1.5	<1.5	<1.5
VPH Aliphatic (>C5-C6)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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SOILS

Lab number			127624-1	127624-2	127624-3	127624-4	127624-5	127624-6
Sample id			BB6BB7	BB7	CC6	DD6	EE5	FF5
Depth (mm)			200.00	500.00	500.00	200.00	100.00	100.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
VPH Aliphatic (>C6-C8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aliphatic (>C8-C10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<0.5	3	1	1	1	<0.5
EPH Aliphatic (>C12-C16)	CE250	mg/kg	1	11	1	3	1	<0.5
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<4.5	18	<4.5	9	<4.5	<4.5
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<1	<1	<1	<1	<1	<1
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	<2	3.2	<2	<2	<2
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			127624-7	127624-8	127624-9	127624-10	127624-11	127624-12
Sample id			GG7	II5	JJ5	KK4	KK5	KK6
Depth (mm)			300.00	400.00	400.00	300.00	200.00	400.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
Arsenic (total)	CE264 ^M	mg/kg As	9.6	12.0	9.2	10.1	30.4	15.7
Cadmium (total)	CE264 ^M	mg/kg Cd	<2	<2	<2	<2	<2	<2
Chromium (total)	CE264 ^U	mg/kg Cr	36.3	53.6	34.0	32.0	31.1	30.8
Chromium (VI)	CE263	mg/kg CrVI	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Copper (total)	CE264 ^M	mg/kg Cu	37.2	38.8	32.4	32.8	34.9	36.7
Lead (total)	CE264 ^U	mg/kg Pb	24.8	33.2	24.7	23.4	26.2	29.6
Mercury (total)	CE264 ^U	mg/kg Hg	<2	<2	<2	2.8	2.6	2.5
Nickel (total)	CE264 ^M	mg/kg Ni	43.1	42.0	40.3	43.0	42.6	43.3
Selenium (total)	CE264	mg/kg Se	<3	<3	<3	<3	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	109.4	118.6	108.4	107.7	123.5	110.6
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	3.1	2.1	2.0	2.5	4.1	2.4
Estimate of OMC (calculated from TOC)	CE197	% w/w	5.4	3.5	3.5	4.4	7.1	4.1
PAH								
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02	0.02	0.17	<0.02	0.05
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	<0.02	0.03	<0.02	0.07	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	<0.02	0.02	<0.02	0.07	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	0.04	0.22	0.05	0.46	0.03	0.06
Anthracene	CE087 ^U	mg/kg	<0.02	0.10	<0.02	0.15	<0.02	<0.02
Fluoranthene	CE087 ^M	mg/kg	<0.02	0.23	<0.02	0.39	<0.02	<0.02
Pyrene	CE087 ^M	mg/kg	0.02	0.20	<0.02	0.34	<0.02	0.03
Benzo(a)anthracene	CE087 ^U	mg/kg	0.02	0.10	<0.02	0.22	<0.02	0.02
Chrysene	CE087 ^M	mg/kg	<0.03	0.09	<0.03	0.21	<0.03	<0.03
Benzo(b)fluoranthene	CE087 ^M	mg/kg	<0.02	0.09	<0.02	0.25	<0.02	<0.02
Benzo(k)fluoranthene	CE087 ^M	mg/kg	<0.03	0.05	<0.03	0.12	<0.03	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	<0.02	0.07	<0.02	0.18	<0.02	<0.02
Indeno(123cd)pyrene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	0.11	<0.02	<0.02
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	<0.02	0.04	<0.02	0.13	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.34	1.25	<0.34	2.94	<0.34	<0.34
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<0.5	<0.5	<0.5	1	<0.5	<0.5
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<1	<1	<1	3	<1	<1
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<2	<2	<2	3	<2	<2
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<5	<5	<5	<5	<5	<5
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
VPH Aliphatic (>C5-C6)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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SOILS

Lab number			127624-7	127624-8	127624-9	127624-10	127624-11	127624-12
Sample id			GG7	II5	JJ5	KK4	KK5	KK6
Depth (mm)			300.00	400.00	400.00	300.00	200.00	400.00
Date sampled			17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Test	Method	Units						
VPH Aliphatic (>C6-C8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
VPH Aliphatic (>C8-C10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<0.5	<0.5	<0.5	1	<0.5	<0.5
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<0.5	<0.5	1	1	<0.5	<0.5
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<1	<1	<1	<1	<1	<1
Subcontracted Analysis								
Calorific value	\$	kJ/kg	<2	<2	<2	2.7	<2	<2
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			127624-13	127624-14	127624-15
Sample id			LL3	LL4	LL5
Depth (mm)			400.00	200.00	300.00
Date sampled			17/10/2023	17/10/2023	17/10/2023
Test	Method	Units			
Arsenic (total)	CE264 ^M	mg/kg As	11.7	10.6	17.3
Cadmium (total)	CE264 ^M	mg/kg Cd	<2	<2	<2
Chromium (total)	CE264 ^U	mg/kg Cr	33.6	29.7	26.8
Chromium (VI)	CE263	mg/kg CrVI	<0.04	<0.04	<0.04
Copper (total)	CE264 ^M	mg/kg Cu	33.2	32.7	71.1
Lead (total)	CE264 ^U	mg/kg Pb	26.1	22.9	204.2
Mercury (total)	CE264 ^U	mg/kg Hg	2.2	2.7	2.3
Nickel (total)	CE264 ^M	mg/kg Ni	37.4	39.8	26.0
Selenium (total)	CE264	mg/kg Se	<3	<3	<3
Zinc (total)	CE264 ^M	mg/kg Zn	99.3	99.4	71.1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	3.6	2.9
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.5	6.2	5.0
PAH					
Naphthalene	CE087 ^M	mg/kg	0.09	0.12	0.07
Acenaphthylene	CE087 ^M	mg/kg	<0.02	0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.03	0.06	<0.02
Fluorene	CE087 ^U	mg/kg	0.03	0.05	<0.02
Phenanthrene	CE087 ^M	mg/kg	0.22	0.43	0.14
Anthracene	CE087 ^U	mg/kg	<0.02	0.12	<0.02
Fluoranthene	CE087 ^M	mg/kg	0.11	0.45	0.05
Pyrene	CE087 ^M	mg/kg	0.11	0.37	0.05
Benzo(a)anthracene	CE087 ^U	mg/kg	0.06	0.24	0.04
Chrysene	CE087 ^M	mg/kg	0.07	0.27	0.04
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.07	0.25	0.03
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.04	0.15	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	0.05	0.22	0.03
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.03	0.11	<0.02
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.06	0.15	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	0.96	3.03	0.45
TPH					
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<0.5	1	<0.5
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	2	4	<1
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<2	4	<2
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<5	6	<5
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1.5	<1.5	<1.5
VPH Aliphatic (>C5-C6)	CE067	mg/kg	< 0.05	< 0.05	< 0.05

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SOILS

Lab number			127624-13	127624-14	127624-15
Sample id			LL3	LL4	LL5
Depth (mm)			400.00	200.00	300.00
Date sampled			17/10/2023	17/10/2023	17/10/2023
Test	Method	Units			
VPH Aliphatic (>C6-C8)	CE067	mg/kg	< 0.05	< 0.05	< 0.05
VPH Aliphatic (>C8-C10)	CE067	mg/kg	< 0.05	< 0.05	< 0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<0.5	1	<0.5
EPH Aliphatic (>C12-C16)	CE250	mg/kg	1	2	<0.5
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<4.5	<4.5	<4.5
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<1	<1	<1
Subcontracted Analysis					
Calorific value	\$	kJ/kg	<2	3.2	5.3
Asbestos (qualitative)	\$	-	NAD	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE264	Arsenic (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg As
CE264	Cadmium (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cd
CE264	Chromium (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Cr
CE263	Chromium (VI)	Discrete Analyser	Dry			mg/kg CrVI
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE264	Copper (total)	Aqua Regia Extraction, ICPOES	Dry	M	2	mg/kg Cu
CE264	Lead (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Pb
CE264	Mercury (total)	Aqua Regia Extraction, ICPOES	Dry	U	2	mg/kg Hg
CE264	Nickel (total)	Aqua Regia Extraction, ICPOES	Dry	M	3	mg/kg Ni
CE264	Selenium (total)	Aqua Regia Extraction, ICPOES	Dry	U	3	mg/kg Se
CE264	Zinc (total)	Aqua Regia Extraction, ICPOES	Dry	M	4	mg/kg Zn
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	As received		0.5	mg/kg PhOH
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
\$	Calorific value	Bomb Calorimeter	Dry		2	kJ/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127624-1	BB6	0.20	N	-
127624-2	BB7	0.50	N	-
127624-3	CC6	0.50	N	-
127624-4	DD6	0.20	N	-
127624-5	EE5	0.10	N	-
127624-6	FF5	0.10	N	-
127624-7	GG7	0.30	N	-
127624-8	II5	0.40	N	-
127624-9	JJ5	0.40	N	-
127624-10	KK4	0.30	N	-
127624-11	KK5	0.20	N	-
127624-12	KK6	0.40	N	-
127624-13	LL3	0.40	N	-
127624-14	LL4	0.20	N	-
127624-15	LL5	0.30	N	-

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

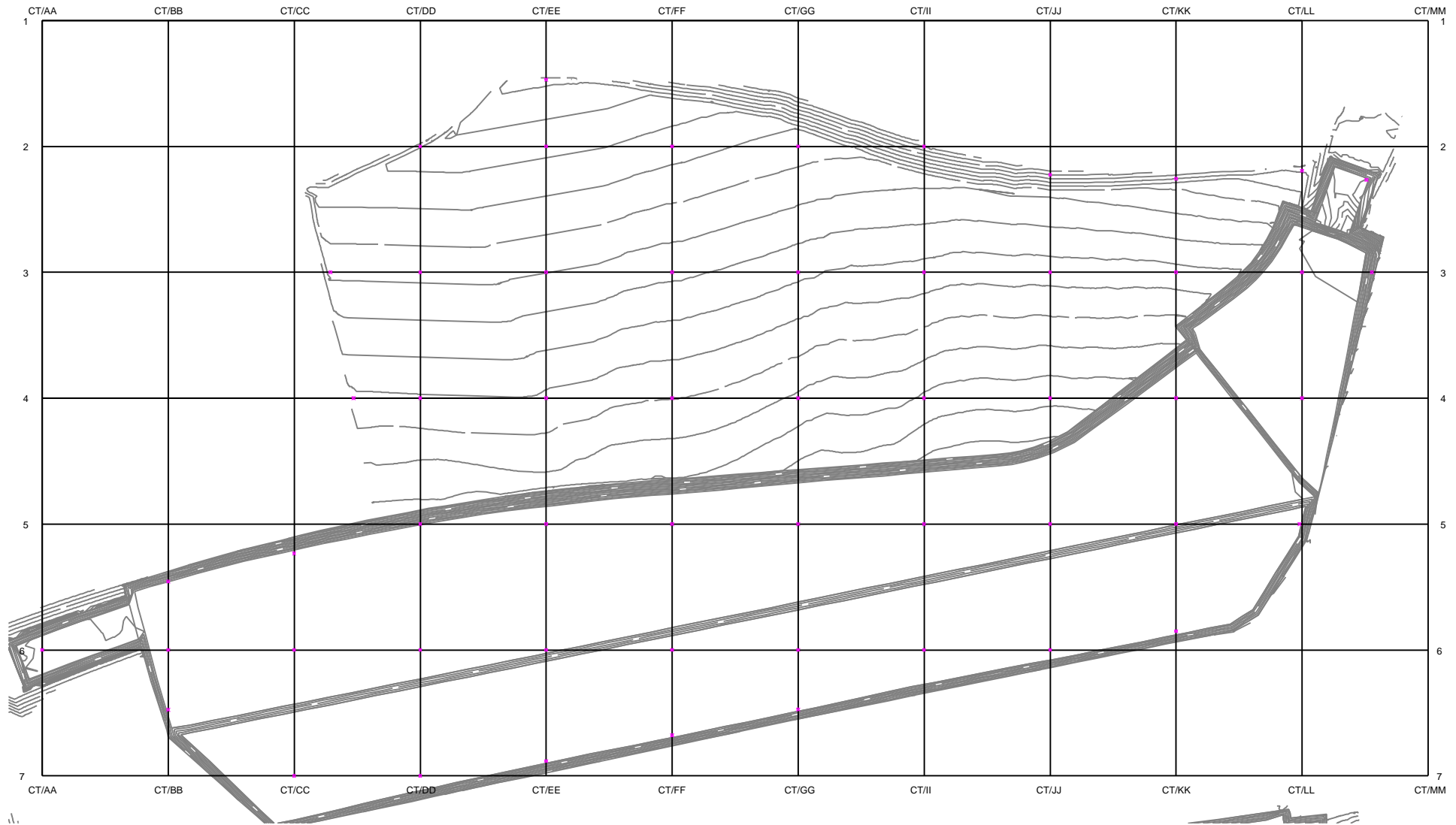
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

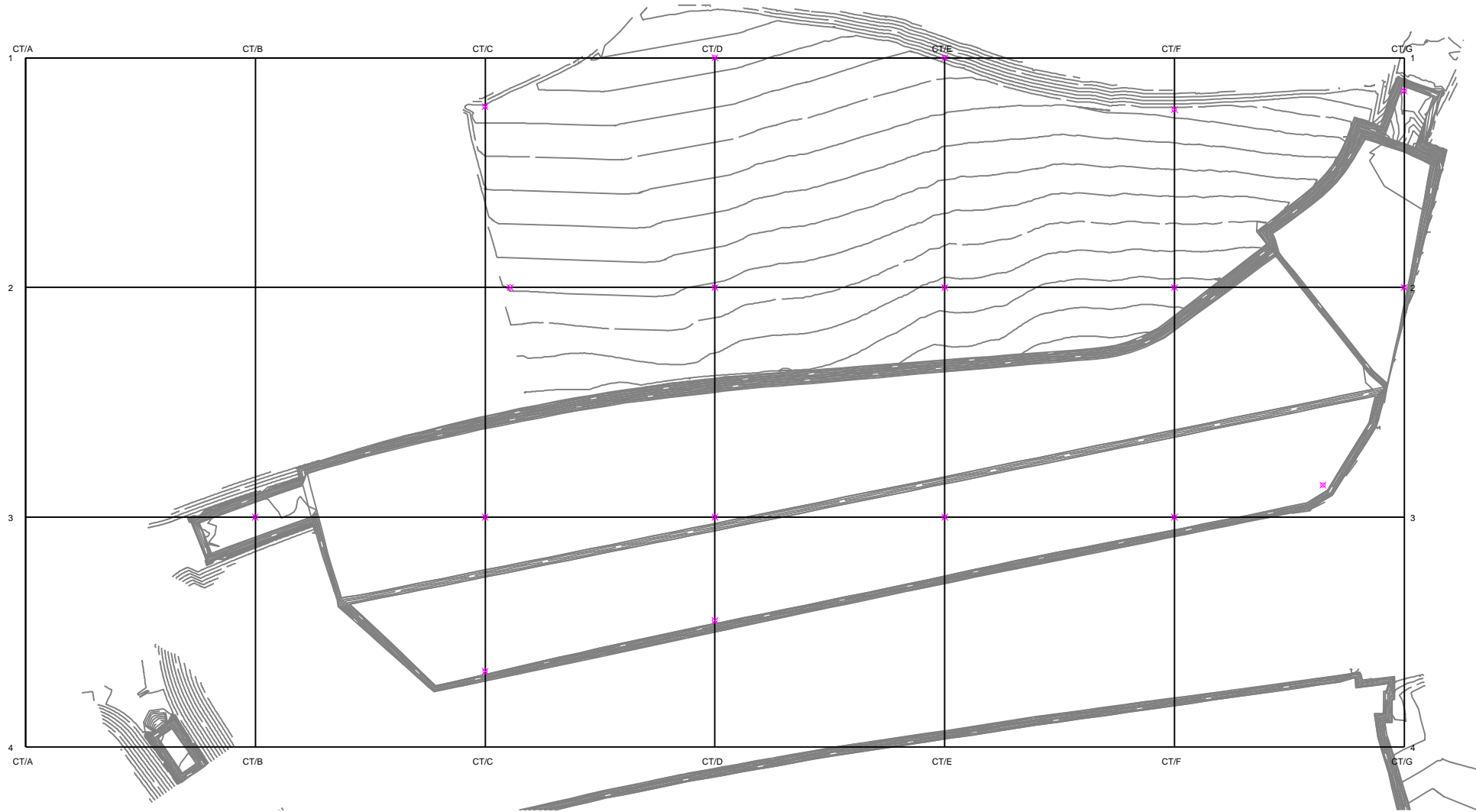
Moisture Content Calculated on a Wet Weight basis

Upper 1m fill - calorific value & TOC (Subsoil only)

50M Grid two samples per location - 1 subsoil 1 topsoil



Upper 600mm fill-table 2 chemical analysis on a 100m grid





Appendix E Post-Earthworks Ground Gas Specification Report by Ground Gas Solutions (For the Whole of the Phase 2 Development Area)

GGS Ltd

Greenheys

Manchester Science Park, Pencroft Way,

Manchester, M15 6JJ

Telephone: 0161 232 7465

Email: info@ggs-uk.com

Web: www.ggs-uk.com



Ground Gas Verification Specification (Post-Earthworks) Phase 2 Development at Skelton Grange, Leeds



Image: GGS site photograph.

Prepared for:



Templegate Developments Limited

Ground Gas Verification Specification (Post-Earthworks)
Phase 2 Development at Skelton Grange, Leeds

Document Control Page



Client	Templegate Developments Limited Western House Halifax Road Bradford BD6 2SZ
Project Title	Ground Gas Verification Specification (Post-Earthworks) Phase 2 Development at Skelton Grange, Leeds
Report No.	GG3070GGVS01R1
Revision Detail	Location plans updated
Revision No.	1.0
Issue Status	FINAL

	Name	Position	Signature	Date
Prepared By:	Joao Dyer BSc (Hons) MSc FGS MEnvSc	Operations Manager		18/08/2022
Revised By:	Joao Dyer BSc (Hons) MSc FGS MEnvSc	Associate Director		15/01/2024

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

FOREWORD

This report has been prepared based on information made available to Ground-Gas Solutions Limited (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.

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

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Ground Gas Verification Specification (Post-Earthworks)
Phase 2 Development at Skelton Grange, Leeds

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Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

Appendices

Appendix A Site location plan and proposed monitoring well location plan

Appendix B Previous monitoring well location plan

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

1 Introduction

GGs Limited (GGs) have been commissioned by JPG Group on behalf of Templegate Developments Limited to provide a Ground Gas Verification Specification (Post-Earthworks) for the Phase 2 Development at Skelton Grange, Leeds, subsequently referred to as 'the Site' throughout this report. The Phase 2 Development is subdivided into Phase 2A, 2B and 2C and is bounded by the red line identified in Figure 1 below.

The development needs to adhere to and work within the following legislation and guidance in order that the construction phase is undertaken safely and there is acceptable risk from ground gas contamination to receptors including construction workers, future site users and building and structures:

- Building Act¹ and associated Regulations e.g. Approved Document C 2013²;
- Planning Act and associated guidance³;
- CDM regulations 2015⁴;
- Health and Safety at Work Act 1974⁵;
- Management of Health & Safety at Work Regulations 1999⁶;
- The Confined Spaces Regulations 1997⁷;
- DSEAR (Dangerous Substances and Explosive Atmospheres) Regulations 2002⁸.

¹ Building Act 1984. 31st October 1984. Her Majesty's Stationary Office.

² Office of the Deputy Prime Minister (ODPM), 2013. 'Approved Document C: Site Preparation and Resistance to Contamination and Moisture'. The Building Regulations, OPDM.

³ Planning Act 2008. Her Majesty's Stationary Office.

⁴ Construction (Design and Management) Regulations 2015. Statutory Instruments 2015 No. 320. Her Majesty's Stationary Office.

⁵ Health and Safety at Work etc. Act 1974.

⁶ Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and Guidance. HSE

⁷ The Confined Spaces Regulations 1997. Statutory Instrument 1997 No. 1713. Her Majesty's Stationary Office.

⁸ The Dangerous Substances and Explosive Atmospheres Regulations 2002. Statutory Instrument 2002 No. 2776. Her Majesty's Stationary Office.

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

^{1.1} Report Objectives

The objectives of this report are as follows:

Provide the specification of the verification work required, with respect to ground gases, following the site preparation earthworks and prior to the start of further development.

^{1.1} Development Proposals

The site under investigation within this report lies within the larger Skelton Grange development that shall comprise roughly 1,100 residential properties as well as a school, open public space, commercial properties and associated link roads. The area under assessment within this report comprises the Phase 2A, 2B and 2C areas of the development which are designated for private residential end use. A site plan is presented in Figure 1 below.

The current proposed broad foundation designs are to include strip/raft foundations which are understood to not extend beyond 4m bgl.

^{1.1} Earthworks completed

It is understood that the Site has undergone ground engineering works including:

- Reduction of ground levels by 4-6m to create a platform for deep dynamic compaction
- Deep dynamic compaction (consolidate a further 6m below platform)
- Processing and re-engineering of the removed material and replacing it back as engineered fill
- The upper 1m is now understood to have a Calorific Value of <math><2\text{mJ/Kg}</math>
- A further 600mm cover layer above the engineered fill for gardens etc.

Ground Gas Verification Specification (Post-Earthworks) Phase 2 Development at Skelton Grange, Leeds



Figure 1 Site plan of the Skelton Grange development with Phase 2A, 2B and 2C highlighted by red line boundaries.

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

² Site Characteristics

^{2.1} Site Description

The Site is located off Pontefract Lane, in close proximity to Junction 45 of the M1 motorway at approximate UK grid reference SE 35600 30899. It sits approximately 6 km south-east of Leeds City Centre and forms part of Phase 2 of the planned private residential development. The Site covers an area of approximately 35 acres.

The Site is bound to the north by Pontefract lane with the M1 motorway beyond. The east is bound by the Phase 1 area of the development with Pontefract Lane and agricultural land beyond. There is a small stream between Phase 2A and 2B that culverts under the M1 motorway. The south is bound by uneven grassland and an operational landfill site. Overhead electricity cables, including a pylon, intersect the site from east to west.

A Site boundary plan is located in Appendix A and also highlighted in Figure 1 above.

^{1.1} Summary of GGS Ground Gas Risk Assessment

GGS undertook continuous monitoring of 10 No. shallow monitoring wells which were installed with response zones between 1 and 28 metres below ground level within the Phase 2 Development area. A monitoring well location plan can be found in Appendix B and a plan is also presented in Figure 2 below.

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds



Figure 2 Monitoring well location plan of pre-earthworks site investigation. Blue locations indicate locations where continuous monitoring was undertaken.

GGs undertook detailed assessment and considered all the evidence and monitoring data, using ‘a lines of evidence’ approach to consider each of the potential gas sources and pollutant linkages that had been identified at the preliminary conceptual model stage. Based on this, GGS recommended that the appropriate classification for the Site should be **Amber 2** as per the NHBC traffic light system, without consideration of earthworks or ground improvement.

GGs also noted that previous investigations highlighted that there are hazardous concentrations of ground gases present within the Pennine Lower Coal Measures below and around the Phase 2 development area, and possibly within the off site made ground material adjacent to the Phase 2 development area. Therefore, any future work undertaken at the Site which may provide pathways for vertical or lateral migration of ground gases from these sources should be avoided.

The proposed ground engineering works (excavation and dynamic compaction, which have now been undertaken), were considered likely to significantly improve both the

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

geotechnical conditions and reduce the risk of ground-gas migration pathways at the Site. Therefore, GGS recommended the following measures be undertaken as part of the ground engineering works:

Monitoring of ground gases and pressures following the dynamic compaction in order to demonstrate when these have stabilised;

Safe system of work required for construction workers in line with confined space regulations (i.e. near or within deep excavations works).

Based on the current classification, in addition to Amber 2 ground-gas protection measures being incorporated into the proposed building design, the following additional measures were also advised to be considered:

Avoid or minimise and manage preferential gas migration pathways via services penetrations, piling columns, sewers, service conduits etc;

Avoid or minimise the risk to future site workers within confined spaces within the made ground;

Removal of any preferential pathways created by the existing monitoring locations.

² Verification Specification

The below ground gas verification specification is proposed for the period following completion of the earthworks phase at the site.

^{2.1} Borehole grouting

An audit will be undertaken by JPG Group of the grouting of deeper boreholes. Evidence of this will be provided by JPG Group.

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

^{1.1} Borehole decommissioning

An audit will be undertaken by JPG Group of all shallow borehole decommissioning as part of the earthworks soil removal process. Evidence of this will be provided by JPG Group.

An audit will be undertaken by JPG Group of post-earthwork shallow wells decommissioning. Evidence of this will be provided by JPG Group.

^{1.1} Engineered replacement material

An audit will be undertaken by JPG Group of the engineered replacement of fill specification including TOC and calorific value analysis and acceptance criteria. Evidence of this will be provided by JPG Group.

^{2.1} Post-earthworks ground gas monitoring

It is proposed that 20no. monitoring wells are installed across the site in a non-targeted or systematic formation. This would provide a nominal spacing of gas monitoring wells of around 100m. As the site has undergone significant earthworks and now comprises an engineered homogenous top layer (at least 4m depth), it is considered that a coverage of 100m per gas monitoring well is appropriate. Proposed monitoring well location plans are included in Appendix A.

Monitoring well response zones should take consideration of proposed foundation designs and service depths. The majority of the response zones should target 1-3m bgl. It is understood that the maximum service depth will likely extend to 5m bgl; in these areas deeper response zones should be considered between 4-5m bgl.

GGs will continuously monitor 10no. locations, with a site visit after a 3-week period to assess the data and consider the relocation of the continuous monitoring devices to other available locations. Periodic monitoring of all wells without continuous monitoring devices will be undertaken on each GGS site visit to aid the decision making of the continuous monitoring locations. The current proposed total continuous

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

monitoring period is 3 weeks; however, additional monitoring will be undertaken should this be required to complete the dataset for appropriate risk assessment.

Surface emissions surveys and flux box tests will be undertaken to assess vertical ground gas migration to surface ground level. Water sampling for dissolved gas analysis will also be undertaken to assess any potential ground gas reservoir and migration within the groundwater at the site.

The above lines of evidence will be used in conjunction with the continuous ground gas monitoring data to provide data for a risk assessment.

^{3.5} Conceptual Site Model and Risk Assessment

The ground gas risk assessment will consider all available data for the site and the adjacent landfill site in line with BS8485:2015+A1:2019^{Error! Bookmark not defined.} and NHBC guidance⁹.

The risk assessment will include Conceptual Site Model (CSM) tables and schematics for the site pre-, during and post- earthworks phases (including monitoring well representation).

Consideration will also be made for the proximity of the adjacent landfill site and the landfill gas management system which is beyond the control of any future development or site ownership.

The risk assessment will provide recommendations for the proposed future residential development and potential future extensions to the properties within this development.

⁹ NHBC/RSK (2007). Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. Report edition no.: 04. March 2007.

Ground Gas Verification Specification (Post-Earthworks)

Phase 2 Development at Skelton Grange, Leeds

^{2.1} Verification report

A verification report will be submitted bringing together the information and findings of all the above items.

In respect of the gas protection system for the proposed buildings and associated infrastructure, a verification plan should be completed at the design stage, in line with latest available ground gas risk assessment for the site as well as the NHBC guidance⁹ and CIRIA guidance C735¹⁰.

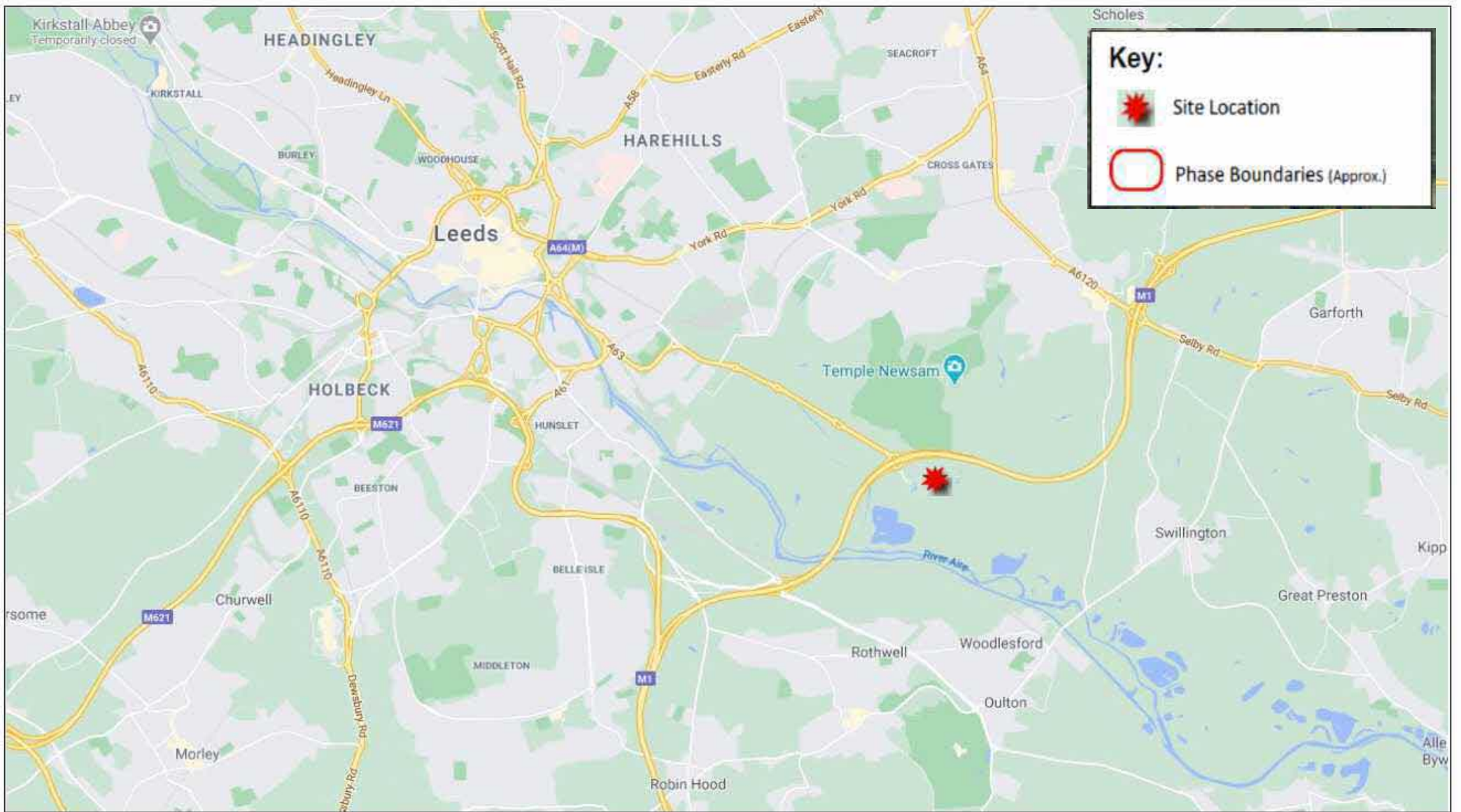
Importantly, the appointed verification contractor should be fully independent and suitably trained and experienced.

¹⁰ CIRIA (2014). Good practice on the testing and verification of protection systems for building against hazardous ground gases. London. CIRIA, C735.

Ground Gas Verification Specification (Post-Earthworks)
Phase 2 Development at Skelton Grange, Leeds

Appendix A

Site Plan & Proposed Monitoring Well Locations



Rev.	Date	Dwn.	Description	App'd
0	01/12/2020	SM	FINAL	JD
1	15/01/2024	EC	FINAL	JD

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TITLE:
 Site location plan

PROJECT: GGS2158 Skelton Grange,
 Phase 2

Drawing No: GGS2158_SLP01



EHELP LEGEND

MW WINDOW SAMPLE BOREHOLE WITH GAS MONITORING WELL INSTALLATION

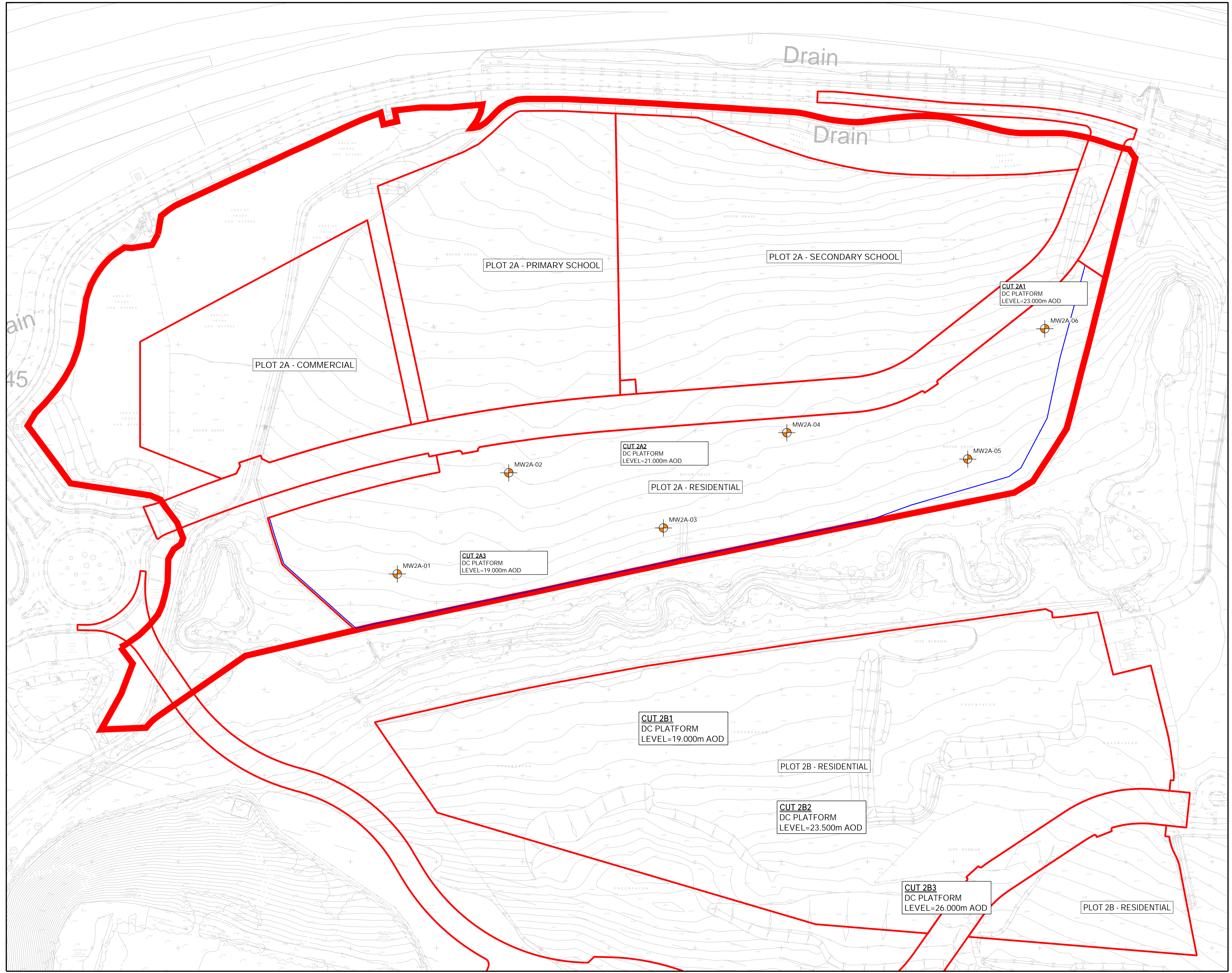
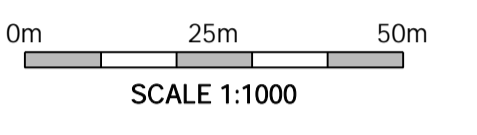
INSTALLATION PIPE DETAILS

MW2A-02, MW2A-04 AND MW2A-06 ARE TO BE INSTALLED TO 5.00M BGL (1.00M PLAIN PIPE, 4.00M SLO TIED).
 MW2A-01, MW2A-03 AND MW2A-05 ARE TO BE INSTALLED TO 3.00M BGL (1.00M PLAIN PIPE, 2.00M SLO TIED).

PLAIN PIPE TO BE LEFT 0.30M ABOVE GROUND TO ALLOW FOR HEADWORK CONSTRUCTION.

DECOMMISSIONING DETAILS

ON COMPLETION OF THE MONITORING, HALLS ARE TO DECOMMISSION THE WELLS BY REMOVAL OF THE PIPEWORK AND FILLING OF THE RESULTANT HOLE WITH BENTONITE AND/OR GROUT.



P04	AS BUILT	17.11.23	JBW	EJS
P03	DRAWING NUMBER UPDATED	24.07.23	JBW	EJS
P02	DECOMMISSIONING DETAIL	23.06.23	JBW	EJS
P01	FIRST ISSUE	13.06.23	JBW	EJS
REV	DESC RIPTION	DATE	CHK	BY

Project
 SKELTON GATE
 JUNCTION 45, M1

Drawing Title
 PHASE 2A: CONTINUOUS GROUND GAS
 VERIFICATION MONITORING WELL
 LOCATION PLAN

INFORMATION

www.jpg.group
 Eadmin@jpg.group | T+44 (0)113 263 1155

EHLF LEGEND

MW WINDOW SAMPLE BOREHOLE WITH GAS MONITORING WELL INSTALLATION

INSTALLATION PIPE DETAILS

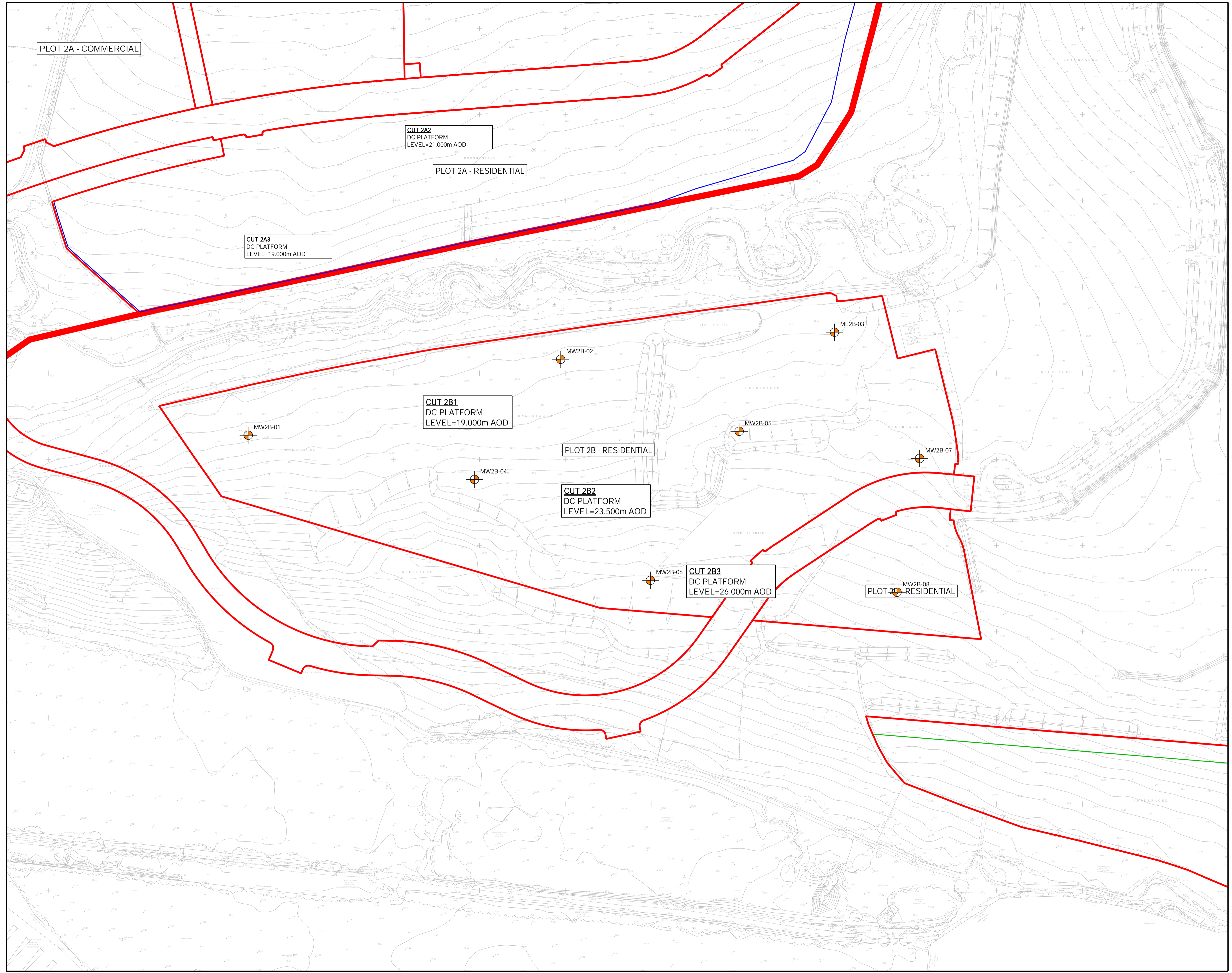
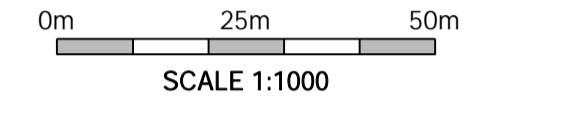
MW2B-01, MW2B-02, MW2B-04, MW2B-07 AND MW2B-08 ARE TO BE INSTALLED TO 5.00M BGL (1.00M PLAIN PIPE, 4.00M SLOTTED).

MW2B-03, MW2B-05 AND MW2B-06 ARE TO BE INSTALLED TO 3.00M BGL (1.00M PLAIN PIPE, 2.00M SLOTTED).

PLAIN PIPE TO BE LEFT 0.30M ABOVE GROUND TO ALLOW FOR HEADWORK CONSTRUCTION.

DECOMMISSIONING DETAILS

ON COMPLETION OF THE MONITORING, HALLS ARE TO DECOMMISSION THE WELLS BY REMOVAL OF THE PIPEWORK AND FILLING OF THE RESULTANT HOLE WITH BENTONITE AND/OR GROUT.



P02	DRAWING NUMBER UPDATED	24.07.23	JBW	EJS
P01	FIRST ISSUE	23.06.23	JBW	EJS
REV	DESC RIPTION	DATE	CHK	BY

Project
 SKELTON GATE
 JUNCTION 45, M1

Drawing Title
 PHASE 2B: CONTINUOUS GROUND GAS
 VERIFICATION MONITORING WELL
 LOCATION PLAN


INFORMATION



DO NOT SCALE (A1)

NO TES

EHELP LEGEND

 MW WINDOW SAMPLE BOREHOLE WITH GAS MONITORING WELL INSTALLATION

INSTALLATION PIPE DETAILS

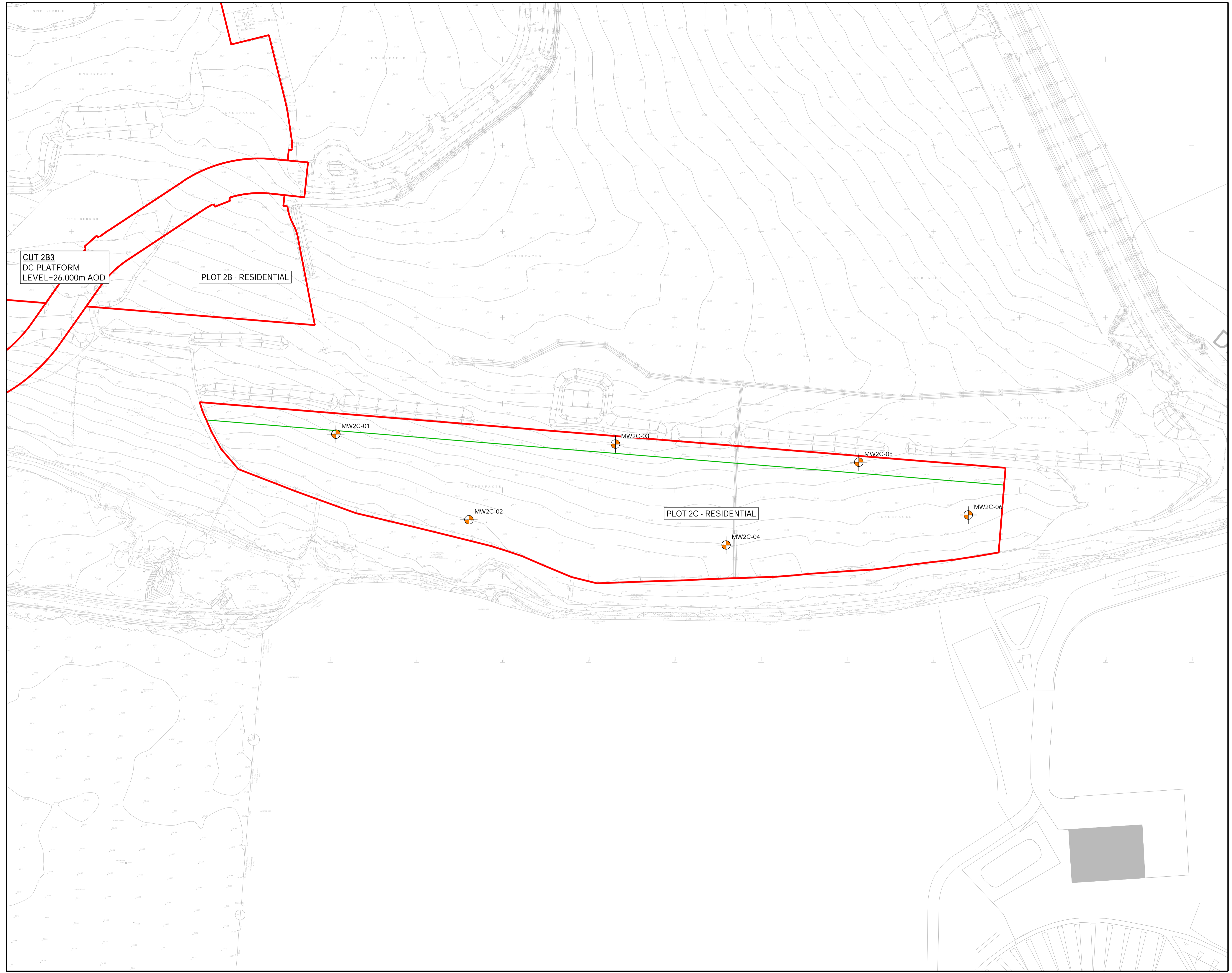
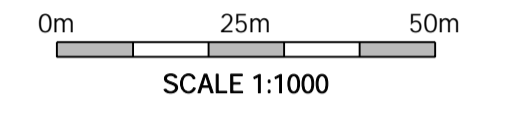
MW2C-01, MW2C-04 AND MW2C-06 ARE TO BE INSTALLED TO 5.00M BGL (1.00M PLAIN PIPE, 4.00M SLOTTED).

MW2C-02, MW2C-03 AND MW2C-05 ARE TO BE INSTALLED TO 3.00M BGL (1.00M PLAIN PIPE, 2.00M SLOTTED).

PLAIN PIPE TO BE LEFT 0.30M ABOVE GROUND TO ALLOW FOR HEADWORK CONSTRUCTION.

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P02	DRAWING NUMBER UPDATED	24.07.23	JBW	EJS
P01	FIRST ISSUE	23.06.23	JBW	EJS
REV	DESCRIPTION	DATE	CHK	BY

Project
 SKELTON GATE
 JUNCTION 45, M1

Drawing Title
 PHASE 2C: CONTINUOUS GROUND GAS
 VERIFICATION MONITORING WELL
 LOCATION PLAN

INFORMATION

Ground Gas Verification Specification (Post-Earthworks)
Phase 2 Development at Skelton Grange, Leeds

Appendix B

Previous Monitoring Well Location Plan



Rev.	Date	Dwn.	Description	App'd
0	04/11/2020	HR	FINAL	JD
1	15/01/2024	EC	FINAL	JD




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TITLE:
Monitoring Location Plan

PROJECT: GGS2158 Skelton Grange, Phase 2

Drawing No: GGS2158_MLP01

KEY:

-  Phase boundary lines (approx.)
-  Periodic Monitoring Location
-  Continuous Monitoring Location





Appendix F Post-Earthworks Ground Gas Verification Report by Ground Gas Solutions (Phase 2A only)



Ground gas verification (Post-earthworks)

Phase 2A Development at Skelton Grange, Leeds

GG3070GGV-P2AR1



Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Document Control Page



Client	Templegate Developments Ltd Western House, Halifax Road, Bradford, BD6 2SZ
Project Title	Ground Gas Verification (Post-Earthworks) Phase 2A Development at Skelton Grange, Leeds
Report No.	GG3070GGV-P2AR1
Report Revision	Section 2.1 general location updated and final versions of logs and as-built EHLP included
Revision Detail	1.0
Issue Status	FINAL

	Name		Position	Signature	Date
Prepared by:	Emily Callaghan	BSc (Hons) MSc AMIEEnvSc	Geo-Environmental Consultant		15/02/2024
Checked and approved by:	Joao Dyer	BSc (Hons) MSc FGS MIEEnvSc	Associate Director		15/02/2024
Revised by:	Emily Callaghan	BSc (Hons) MSc AMIEEnvSc	Geo-Environmental Consultant		15/02/2024

Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

FOREWORD

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Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

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Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

1 Introduction

GGs Limited (GGs) have been commissioned by Hall Construction Services Ltd to on behalf of Templegate Developments Ltd to carry out ground-gas monitoring following a period of major earthworks at the Phase 2A Development at Skelton Grange, Leeds, subsequently referred to as 'the site' throughout this report. The Phase 2 Development is sub-divided into Phase 2A, 2B and 2C and is bounded by the red lines identified in Figure 1 below.

A ground gas risk assessment of the site has already been undertaken by GGS (Report Ref.: GGS2158GGRA01 dated 1st December 2020) which characterised the site as Amber 2 under the NHBC¹ traffic light system. As a major phase of earthworks has been undertaken since this assessment, GGS (in agreement with JPG Group and the NHBC) have undertaken an additional period of ground gas monitoring in order to verify the ground gas conditions at the site have not worsened as a result.

This report considers the NHBC traffic light system which was used at the time of the initial GGS report for the site in 2020 (Ref.: GGS2158GGRA01). The purpose of this additional assessment is to confirm if the previous classification of Amber 2 is still suitable following the earthworks. This report also considers to the updated guidance from the NHBC² issued in 2023 which advises that the approach should now be as described in the current British Standard (BS8485³).

It should be noted that any works carried out post-monitoring and after issue of this report are beyond the scope of this assessment.

The development needs to adhere to and work within the following legislation and guidance in order for the construction phase to be undertaken safely and there is acceptable risk from ground contamination to receptors including construction workers, future site users and building and structures:

¹ NHBC (2007). Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present.

² NHBC (2023). Hazardous ground gas – an essential guide for housebuilders. NF94. April 2023.

³ BSI (2019). Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BS8485:2015+A1:2019.

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- Building Act⁴ and associated Regulations e.g. Approved Document C 2013⁵;
- Planning Act and associated guidance⁶;
- CDM regulations 2015⁷;
- Health and Safety at Work Act 1974⁸;
- Management of Health & Safety at Work Regulations 1999⁹;
- The Confined Spaces Regulations 1997¹⁰;
- DSEAR (Dangerous Substances and Explosive Atmospheres) Regulations 2002¹¹.

^{1.1} Report Objectives

The objectives of this report are as follows:

Assess the site following a period of major earthworks since 2020 in order to verify the ground gas conditions at the site have not worsened;

Utilise continuous monitoring data to assess ground-gas risk to future receptors using a lines of evidence approach;

Prepare a revised and detailed diagrammatic conceptual site model.

GGS understands that, due to the historic nature of the site (former open cast colliery) and surrounding land use (former open cast colliery and landfill sites), a characterisation of the site below Amber 2 will not be accepted by the NHBC. Therefore, this assessment aims to verify the site has not elevated from Amber 2 to Red, following the period of major earthworks since 2020.

⁴ Building Act 1984. 31st October 1984. Her Majesty's Stationary Office.

⁵ Office of the Deputy Prime Minister (ODPM), 2013. 'Approved Document C: Site Preparation and Resistance to Contamination and Moisture'. The Building Regulations, ODPM.

⁶ Planning Act 2008. Her Majesty's Stationary Office.

⁷ Construction (Design and Management) Regulations 2015. Statutory Instruments 2015 No. 320. Her Majesty's Stationary Office.

⁸ Health and Safety at Work etc. Act 1974.

⁹ Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and Guidance. HSE

¹⁰ The Confined Spaces Regulations 1997. Statutory Instrument 1997 No. 1713. Her Majesty's Stationary Office.

¹¹ The Dangerous Substances and Explosive Atmospheres Regulations 2002. Statutory Instrument 2002 No. 2776. Her Majesty's Stationary Office.

Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

^{1.1} Development Proposals

The site under investigation within this report lies within the larger Skelton Grange development that shall comprise roughly 1,100 residential properties as well as a school, open public space, commercial properties and associated link roads. The area under assessment within this report comprises the Phase 2A area of the development and is located in the north-western section of the overall development. GGS understands that this area is designated for private residential end use. The Phase 2A development is bounded by the red line identified in Figure 1 below.

Prior to development, it is understood that the Site has undergone significant ground engineering works including:

- Reduction of ground levels by 4-6m to create a platform for deep dynamic compaction
- Deep dynamic compaction (consolidate a further 6m below platform)
- Processing and re-engineering of the removed material and replacing it back as engineered fill
- The upper 1m materials were screened and to have a Calorific Value of <math><2\text{mJ/Kg}</math>



Figure 1 Site plan of the Skelton Grange development with Phase 2A, 2B and 2C highlighted by red line boundaries.

Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

^{1.1} Scope of works

GGs' scope of works has been set out in the ground gas verification specification report (Report Ref.: GGS3070GGVS01 dated 18th August 2022). This scope was discussed, developed and agreed in a meeting held on 5th July 2019 between GGS, JPG Group and the NHBC, as well as subsequent discussions about each development phase at Skelton Grange.

3no. rounds of periodic monitoring at 6no. monitoring well locations

Continuous ground gas monitoring at 3no. monitoring well locations for a 3-week period

1no. surface emissions survey

4 no. flux box tests

Water sampling for dissolved gases analysis at 2no. monitoring well locations

Provision of a Ground Gas Verification (Post-Earthworks) report

In order to facilitate the above scope of works, Allied Exploration & Geotechnics Ltd was commissioned by the principal contractor (Hall Construction Services Ltd) to install 6no. monitoring wells across the site, following advice and guidance by GGS regarding the locations and response zone depths of these. The monitoring wells were installed on 31st August 2023 and 1st September 2023. The response zones of the new monitoring wells are between 1 and 3 m bgl, and 1 and 5m bgl.

A monitoring well location plan can be found in Appendix A, and the borehole logs are presented in Appendix B.

Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

2 Site Characteristics

2.1 Site Description

Table 2.1 below details the site description. A site location plan is presented in Appendix A..

Table 2.1 Site description

Description	Details
General Location	The Site is located off Lakeside Way, in close proximity to Junction 45 of the M1 motorway at approximate UK grid reference SE 35491 31006. It sits approximately 6 km south-east of Leeds City Centre and comprises the Phase 2A of the planned private residential development.
OS National Grid Reference (approximate centre of site)	SE 35491 31006
Site area (approximate total)	4.20 Hectares
Overview	During the continuous ground-gas monitoring period the site comprised a newly developed engineered clay platform for future housing development, the spine road of the development was partially constructed and trenches for future services were in construction adjacent to the spine road. The site generally slopes down towards the centre and west of the site. The site comprised some grassed land with rows of trees at the southern perimeter.
North of the site	The Site is bound to the north by further land being prepared for construction as part of the wider development, with the M1 motorway located beyond.
South of the site	There is a small stream to the south that culverts under the M1 motorway. The south is bound by Phase 2B of the development and overhead electricity cables, including a pylon. Beyond this is an operational landfill site.
East of the site	Phase 1 of the wider development area is located to the east of the site.
West of the site	The west is bound by Lakeside Way with Skelton Lake Services beyond.

Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

1.1 Site History

Relevant factual information has been summarised below from previous reporting provided to GGS, including relevant historical uses and features which may give rise to ground-gas contamination.

Only features which are located within 250m of the Site or have the potential to provide a ground-gas contaminative source or migration pathway are considered.

Table 2.1 Key historical features

Feature	Years Present	Distance (approx.)	Bearing (site)	Comments
Opencast coal mine	Unknown - 1994	n/a	On site, extending to the east, west and south.	Several features have been recorded on site relating to the opencast coal mine since the earliest available maps in 1854 until 1994. These include pits, shafts, ponds, lagoons, slag heaps, sludge beds and highwalls.
Infilled land / Open Farmland	1994 - 2020	n/a	On site	Following infilling of opencast coal mine with colliery spoil in approx. 1994, the site has remained as vegetated farmland until earthworks began since 2020.
Un-named water course	Unknown - Present	20 m	South	Un-named water course flowing to the south-west towards a large pond approximately 400m to the south-west of the Site.
Motorway (M1)	2000 - Present	40 m	North	Junction 45 of M1 motorway located approx. 200m to the north-west of the Site.
Landfill site	2002 - Present	450 m	South	The landfill site to the south of the site is still operational and owned by Biffa Waste Services. Previous records describe the waste as household, commercial and industrial.
Infilled land	1950's - 1994	200 m	South	Large Pulverised Fuel Ash (PFA) stockpile thought to rise 20 m above previous ground levels.

1.1 Environmental Setting

The environmental setting has been collated from previous reporting and borehole logs, and has been summarised below in Table 2.2.

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Table 2.2 Summary of the environmental setting

Made Ground	<p>Made ground was encountered within all monitoring wells of the AEG Ltd logs for the JPG 2019 investigation. The made ground was largely described as firm, grey, slightly sandy, gravelly Clay with cobbles noted. The gravel was noted to comprise mudstone, sandstone, coal and brick. The made ground across the site is known to be associated with the colliery spoil. The depth of the made ground in Phases 2A and 2B ranges from 6 to 43m bgl and 19 to 64m bgl, respectively. In Phase 2C the made ground was recorded to the final depths of all boreholes, the deepest being 13.6m bgl.</p>
Superficial geology	<p>The 1:50,000 British Geological Survey (BGS) map for the area indicates no recorded superficial geology for the site location¹². Available borehole records also indicate no presence of superficial geology under the Site. Any previously existing superficial deposits at the Site are likely to have been removed during the opencast colliery excavations and either exported or re-deposited on site as made ground.</p>
Solid geology	<p>The 1:50,000 British Geological Survey (BGS) map for the area indicates the site is situated above the Pennine Lower Coal Measures Formation. This commonly consists of interbedded grey mudstone, siltstone and pale grey sandstone, commonly with thicker coal seams in the upper part.</p> <p>The site investigation undertaken by AEG Ltd for JPG in 2019 recorded coal measure geology underlying the site in boreholes CP206, CP2088, CP209, CP210 and CP211. These are all situated in Phase 2B. The coal seams were encountered between 23 and 70m bgl and had a thickness of between 0.1 and 1.9m.</p> <p>Two faults runs through the Site, from west to east, mostly under the location of the water course between Phase 2A and 2B. These faults are down-throwing to the south east.</p>
Hydro-geology	<p>According to the Defra's Aquifer Designation Map¹⁰ the site sits on a Secondary A aquifer. Groundwater flow through the permeable sandstone and rock fractures is likely, however, flow through the made ground is unlikely due to the cohesive clayey material. Due to mining activity the groundwater quality is likely to be poor.</p> <p>Groundwater flow is inferred to be in a south westerly direction towards the water body associated with the Skelton Grange Country Park and the River Aire.</p> <p>It is believed that the encountered water levels in previous and current investigations are perched across the site within the made ground, as the monitoring wells have predominantly been within the made ground material. The groundwater level within the bedrock is not known.</p>
Hydrology	<p>There is a small un-named water course between the Phase 2A and Phase 2B areas, 10 m from the site at its closest point, which runs towards the south-west and is culverted to the north under the M1 motorway.</p> <p>Along Pontefract lane, drainage ditches run either side of the road. There is a large body of water around 400m south west of the site associated with Skelton Grange Country Park and another around 500m south east of the site.</p>

¹² <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> Viewed 10th July 2018

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Mining	<p>The Coal Authority data states that the Site is located within the Coal Authority Reporting area and it is within a development high risk area¹³. There has been extensive sub-surface mining activity and also surface open cast mining works in the past that have since been backfilled.</p> <p>There are no known mine entries or shafts on the Site. The nearest known mine entries are 3 shafts located in the Phase 1 area of the development. These are understood to have been remediated as part of the ground engineering works in the Phase 1 area.</p> <p>The opencast mines have been backfilled with the restoration having been completed by 2000. The backfilling of the sites was by end tipping, not engineered fill.</p>
Radon	<p>The Radon UK interactive map states that the southern portion of the site is within an area where less than 1% of homes are above the radon action level¹⁴. The northern portion of the site falls within an area where 1-3% of homes are above the radon action level.</p>
Landfill sites / Infilled sites	<p>The Site forms part of a wider historic opencast mine that has undergone extensive workings. The opencast mine has since been infilled with made ground comprising opencast colliery spoil.</p> <p>The nearest authorised landfill that is stated on the GroundSure Enviro Data Viewer¹³ is approximately 50 m to the south of the Phase 2C area at the closest point. This landfill is still operational and owned by Biffa Waste Services. The Environment Agency permit reference for this landfill is EPR/BJ9339IF. Records describe the received waste as household, commercial and industrial. The landfill is located over a previously existing void created as part of East Leeds opencast coal fields which ceased extraction in the early 1970's. In 2004 the infill rate was in excess of 500,000 tonnes per annum. It is understood that the operator has engineered the landfill using traditional lining methods and a full perimeter gas collection system has been installed at the landfill site.</p> <p>An area of land approx. 100m to the south-west of the site (west of the operational landfill) is known to have been infilled with Pulverised Fuel Ash (PFA). The PFA is understood to have originated from Skelton Grange Power Station which was closed in 1994 and subsequently demolished.</p>
Industrial land uses	<p>No other industrial land uses have been recorded at the site.</p>

2.1 Previous reporting and information

For context, this report should be read in conjunction with the below reports and information:

Skelton Business Park, Geo-Environmental Ground Investigation Interpretative Report. December 2000. White Young Green Environmental (WYG). Report Ref: E704/GI/INT/V1

¹³ <http://mapapps2.bgs.ac.uk/coalauthority/home.html> Viewed 10th July 2018

¹⁴ <http://www.ukradon.org/information/ukmaps>. Viewed 5th November 2023

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Skelton Site. Phase 1 Geo-environmental Desk Study. September 2008. Mott MacDonald. Report Ref: 242271/GEO/004/A

Aire Valley, Preliminary Geo-environmental Interpretative Report. February 2009. Mott MacDonald. Report Ref: 242271/08/B

Geoenvironmental Appraisal – Land at Skelton Grange for Templegate Developments. Lithos. July 2015. Report no. 1790/1a / Skelton Grange – Gas risk assessment. Letter to Templegate Developments. Lithos Consulting. July 2016.

Factual Report on Ground Investigation For Templegate Developments Limited. Structural Soils Limited (SSL) on the instruction of JPG. February 2018. Report Ref: 764419

Continuous monitoring investigation – Ground Gas Solutions. March to April 2018. GGS Ref: GGS1559

Ground Gas Risk Assessment for the Phase 1 Development at Skelton Grange, Leeds. GGS Ltd. August 2018. Report Ref: GGS1620GGRA01 – Revision 2.0.

Ground Gas Risk Assessment for the Phase 2 Development at Skelton Grange, Leeds. GGS Ltd. December 2020. Report Ref: GGS2158GGRA01.

Ground Gas Verification Specification (Post-Earthworks). Phase 2 Development at Skelton Grange, Leeds. GGS Ltd. August 2022. Report Red: GGS3070GGVS01.

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² Monitoring Methodology

^{2.1} Periodic Ground-Gas Monitoring

GGs undertook periodic monitoring of the 6no. newly installed monitoring wells (MW2A-01 – MW2A-06) during site visits undertaken on 18th and 25th September and 16th October 2023.

GGs periodic monitoring included the measurement of borehole flow rates, bulk gas concentrations (methane – CH₄, carbon dioxide – CO₂ and oxygen – O₂), trace gas compounds (hydrogen sulphide - H₂S and carbon monoxide - CO) and barometric pressure. A GFM430 series gas analyser and a GA5000 gas analyser were used to record these parameters.

Water levels and base depths were recorded using a geotechnical groundwater dip meter.

A summary of the periodic monitoring results is shown in Section 4.1 and the collected data and site visit records are presented in Appendix C.

^{1.1} Continuous Ground-Gas Monitoring

Continuous ground-gas monitoring was undertaken at 3no. selected monitoring wells for three weeks between 25th September and 16th October 2023. Table 3.1 details the schedule of continuous gas monitoring at the site, as well as the instrument model and ID numbers.

Table 3.1 Schedule of continuous monitoring at the site

BHID	Dates monitored	Instrument Model & ID
MW2A-01	25/09/2023 – 16/10/2023	GasClam 000028/04/09 Gas Flow 03020005
MW2A-04	25/09/2023 – 16/10/2023	GasClam 000338/06/12 Gas Flow 03020019
MW2A-05	25/09/2023 – 16/10/2023	GasClam 000026/09/14 Gas Flow 03020018

GGs configured the instruments to record at 60-minute intervals for the period of monitoring, to monitor bulk gas concentrations, methane (CH₄), carbon dioxide (CO₂) and oxygen (O₂) and trace gases, including hydrogen sulphide (H₂S) and carbon monoxide (CO). A Solinst™

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Barologger was installed at the site to accurately record temperature (°C) and atmospheric pressure (mbar).

Continuous monitoring data is presented in Appendix D. Continuous monitoring graphs are presented within Section 4.2. An outline of the GGS GasClam® Instrumentation Overview & Deployment Information is presented in Appendix E.

^{1.1} Surface emissions survey

A surface emission survey of the site was completed on 18th October 2023. An Inficon Irwin portable gas detector was used to measure methane close to the ground surface at concentrations to a resolution of 1 part per million by volume (ppmv).

The surface emission survey was undertaken along predetermined transect lines in line with the Environment Agency Guidance on the monitoring of landfill gas surface emissions (LFTGN07 v2 2010¹⁵). The specialised sample probes for the Inficon™ Irwin instrument is fitted with a funnel cup (150ml) and held close to the ground surface as practically possible (in any case <5cm), thus retrieving an air sample of any localised emissions from the surface. By walking along transect lines at a slow walking speed (approximately 1.5 mph) an accurate representation of surface emissions across the surveyed site can be obtained.

A summary of the surface emissions surveys is presented in Section 4.3, whilst the raw data is presented in Appendix F.

^{2.1} Flux box tests

Flux box tests were undertaken on 18th October 2023. All tests were completed in line with the Environment Agency Guidance on monitoring landfill gas surface emissions (LFTGN07 V2 2010¹⁵).

Ground gas flux emitted from the surface is determined by using a gas tight receptacle of a known volume and basal area. In all cases, a flux box fitted with two ports on the top, was used. A Gazomat Inspectra Laser portable gas detector (TDL-500) was used for monitoring methane in parts per million (ppm) and a GFM130 gas analyser was used for monitoring

¹⁵ Environment Agency (2010). Guidance on monitoring landfill gas surface emissions. LFTGN07 v2 2010.

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carbon dioxide in ppm. The inlet port of the flux box is used to equalise pressure whilst the outlet port is used to connect the TDL-500 and GFM226 by means of a quick release monitoring valve. The total volume of each flux box used is 165 litres (0.165 m³) and the footprint is 0.565 m².

To ensure accurate measurements, the flux box is temporarily sealed to the ground surface using loose sand mixed with bentonite powder. The sand and clay used was damp and compressed to provide an adequate seal to the surface for each flux box test. In all cases, the temporary seal was adequate to prevent air ingress and gas escaping, even in windy conditions.

Each flux box test location is assessed for practicality and safety, and if suitable the test is then ascribed with a unique reference number. Prior to starting the test, the current weather conditions are recorded along with accurate measurements of temperature, atmospheric pressure and wind speed and direction. Other pertinent information is also recorded, for example, ground surface conditions.

Once the readings from the TDL-500 and GFM226 instruments have stabilised, the flux box is placed face-down upon the sand / clay seal and the inlet port is closed. The TDL-500 and GFM226 instruments are then used to record methane and carbon dioxide, respectively, at predetermined set time intervals of 30 seconds, 1, 2, 3, 4, 5, 10 and 15 minutes.

The flux box test duration should be a minimum of 15 minutes and to a maximum of 30 minutes, dependent on concentrations measured. For example, continuing a test where no significant rate of change is recorded would be of no benefit to the test and concentrations that are excessively high after a short period may present a health and safety risk. It is ensured that all sample cycle periods are no longer than 15-30 seconds, as excessive air pumped from the flux box can change the pressure inside the chamber and affect the results.

A summary of the flux box test results is shown in Section 4.4 and the collected data, site visit records and flux box test location plan are presented in Appendix K.

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^{3.5} Dissolved gas sampling

Groundwater samples were taken from monitoring well locations where sufficient groundwater levels were present to enable the use of a low flow bladder pump methodology. Sample locations were selected for suitability considering site observations, monitoring records and project objectives. Some monitoring well locations were not considered suitable for sampling due to the absence of groundwater. Samples were taken from MW2A-04 and MW2A-05 on 18th October 2023.

A water quality meter was used to observe the stabilisation of the groundwater's physical characteristics before samples were taken. All samples were sent for laboratory analysis for dissolved methane and carbon dioxide. A summary of water sampling results is presented in Section 4.5 and the laboratory certificates are presented in Appendix G.

^{2.1} Instrument specifications

The specifications of instruments used during this investigation are presented in Appendix H, together with their current calibration certificates.

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4 Monitoring results

2.1 Periodic ground gas monitoring results

GGs undertook periodic monitoring of selected wells at the site on 18th and 25th September and 16th October 2023. A summary of periodic and continuous ground gas monitoring results is provided in Table 4.1 below. The full periodic monitoring records are presented in Appendix C.

Table 4.1 Summary of periodic and continuous gas monitoring results

Monitoring Location	Response Zone Stratum	Max. positive Flow Rate (l/hr)	Max. CH ₄ (% v/v)	Max. CO ₂ (% v/v)	Min. O ₂ (% v/v)	Max. CO (ppmv)	Max. H ₂ S (ppmv)	Max. Standing water level (mbgl)
MW2A-01	Made ground CLAY 1.00 – 3.00m bgl	0.1	0.3	11.2	0.1	3	<1	Dry
MW2A-02	Made ground CLAY 1.00 – 5.00m bgl	<0.1	0.3	4.8	<0.1	7	<1	4.05
MW2A-03	Made ground CLAY 1.00 – 3.00m bgl	<0.1	0.1	9.7	2.0	2	<1	1.24
MW2A-04	Made ground CLAY 1.00 – 5.00m bgl	0.1	0.2	8.3	1.5	1	<1	3.79
MW2A-05	Made ground CLAY 1.00 – 3.00m bgl	<0.1	0.3	9.4	8.4	2	<1	2.86
MW2A-06	Made ground CLAY 1.00 – 5.00m bgl	0.1	0.2	9.6	3.0	3	<1	2.90

Key: l/hr - litres per hour; % v/v - Percentage volume by volume; ppmv - parts per million by volume; mbgl - metres below ground level; Max. - Maximum; Min. – Minimum; NM – Not measured.

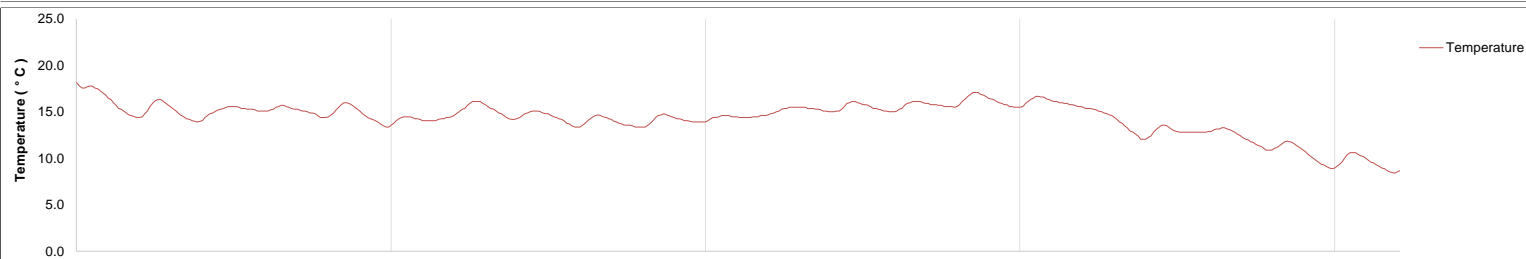
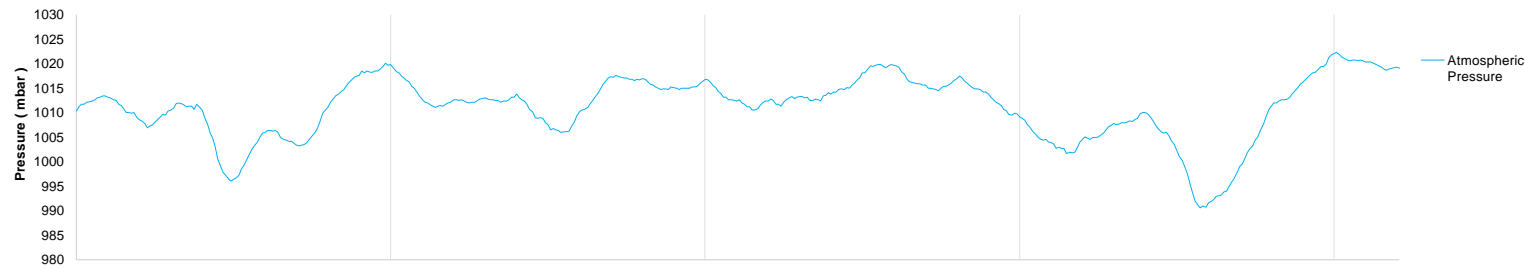
2.1 Continuous ground gas monitoring results

A summary of continuous ground gas monitoring results is provided in Table 4.2 below.

Table 4.2 Summary of periodic and continuous gas monitoring results

Monitoring Location	Response Zone Stratum	Max. positive Flow Rate (l/hr)	Max. CH ₄ (% v/v)	Max. CO ₂ (% v/v)	Min. O ₂ (% v/v)	Max. CO (ppmv)	Max. H ₂ S (ppmv)
MW2A-01	Made ground CLAY 1.00 – 3.00m bgl	2.14	<0.1	15.1	<0.1	10	1
MW2A-04	Made ground CLAY 1.00 – 5.00m bgl	0.03	0.3	11.2	<0.1	2	<1
MW2A-05	Made ground CLAY 1.00 – 3.00m bgl	6.56	0.2	13.7	3.0	3	1

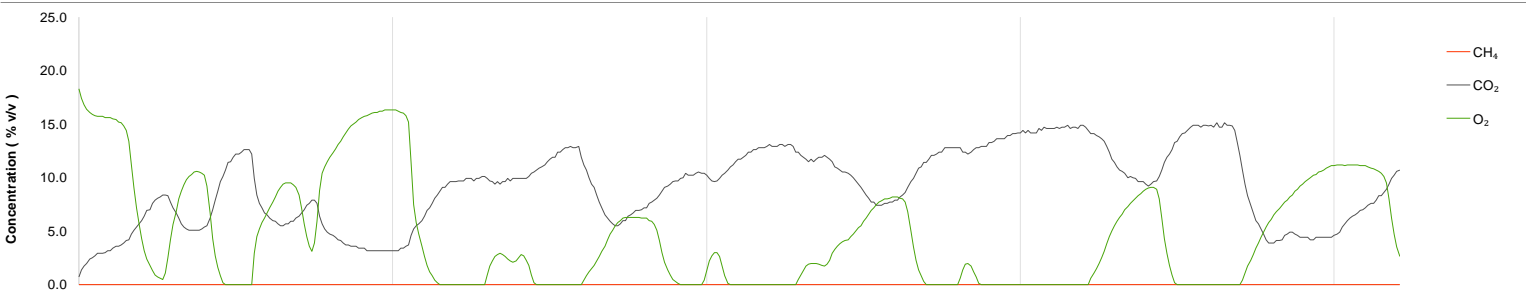
The time series graphs for the continuous monitoring are shown on the following pages, with accompanying summary tables showing maximum and minimum values. The raw time series data is presented in Appendix D.



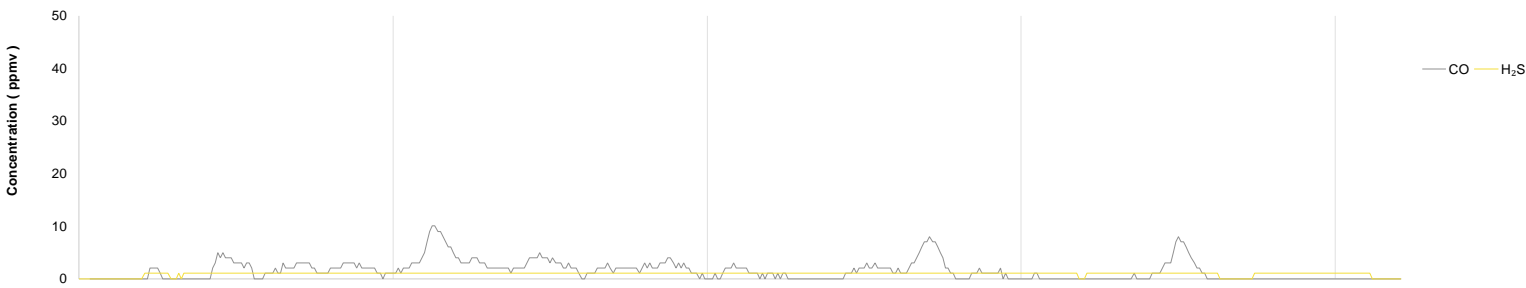
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MW2A-01 - Time Series Graphs

Project:
GGS3070 - Skelton Grange, Phase 2

Client:
Hall Construction Services Ltd



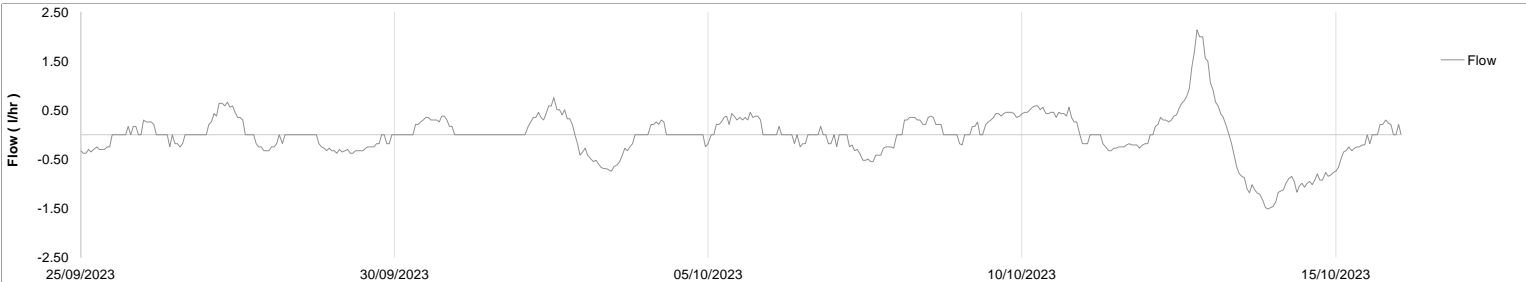
Minimum / Maximum Table		
Parameter	Minimum	Maximum
CH ₄ (% v/v)	0.0	0.0
CO ₂ (% v/v)	0.7	15.1
O ₂ (% v/v)	0.0	18.3
Hydrogen Sulphide (ppmv)	0	1
Carbon Monoxide (ppmv)	0	10
Atmospheric Pressure (mbar)	991	1022
Borehole Pressure (mbar)	992	1023
Temperature (°C)	8.4	18.2
Flow (l/hr)	-1.51	2.14

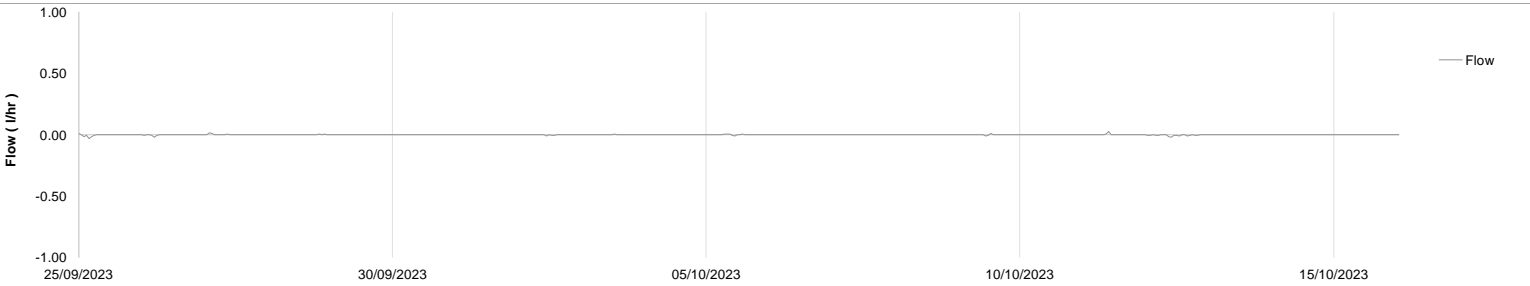
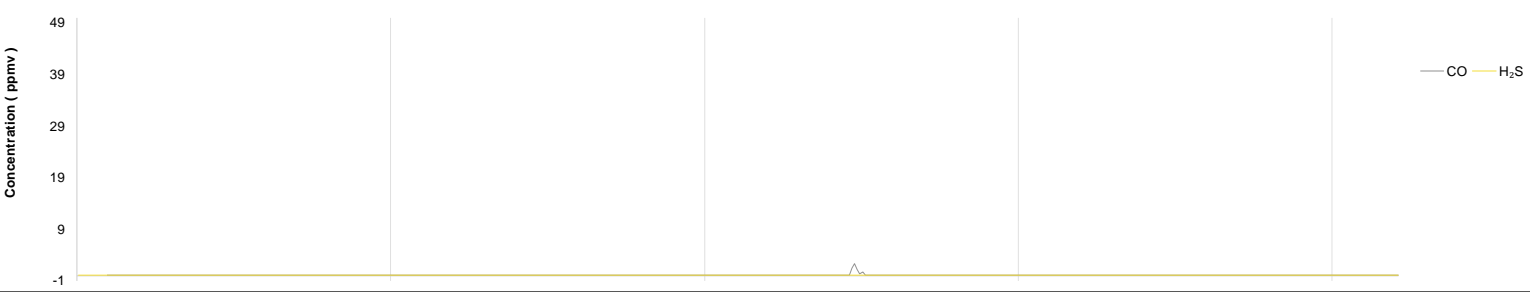
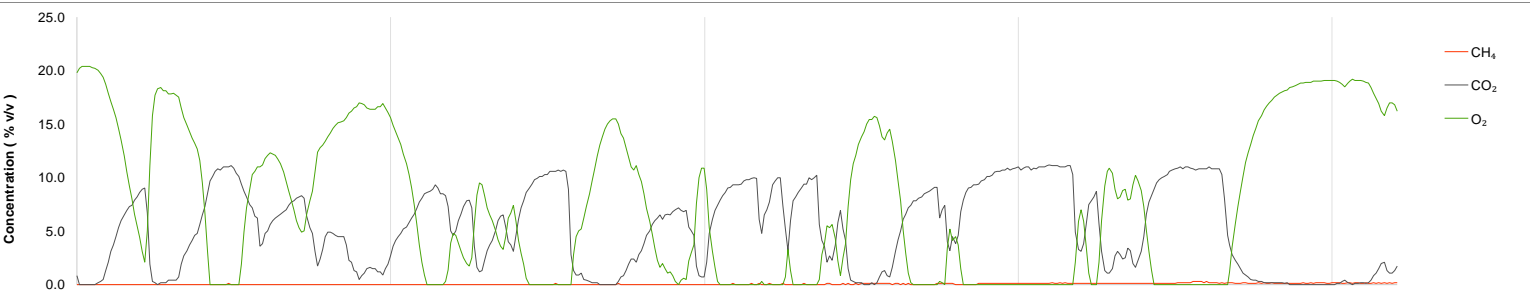
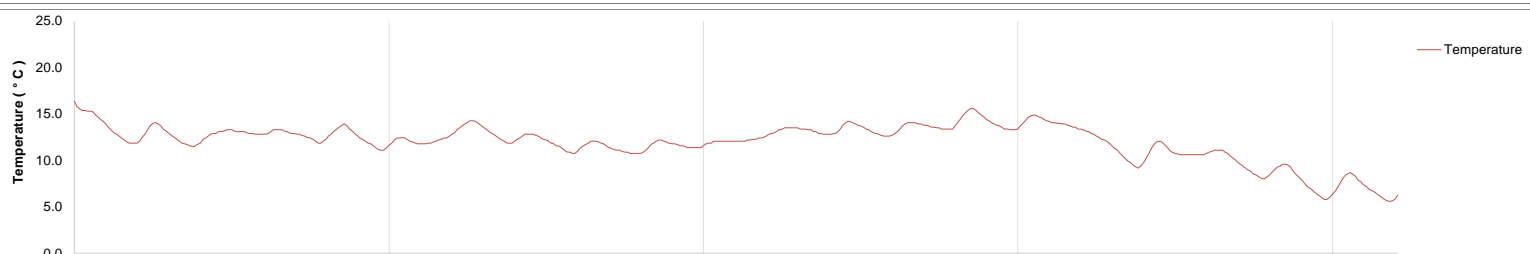
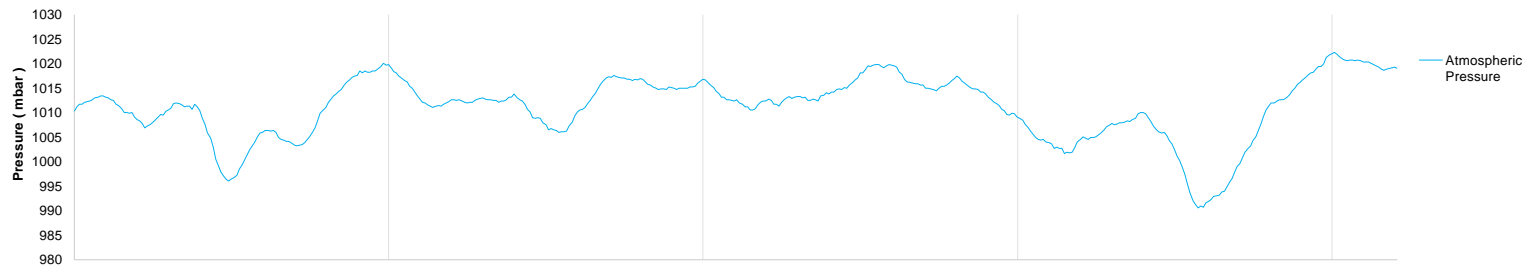


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Title:
MW2A-04 - Time Series Graphs

Project:
GGS3070 - Skelton Grove, Phase 2

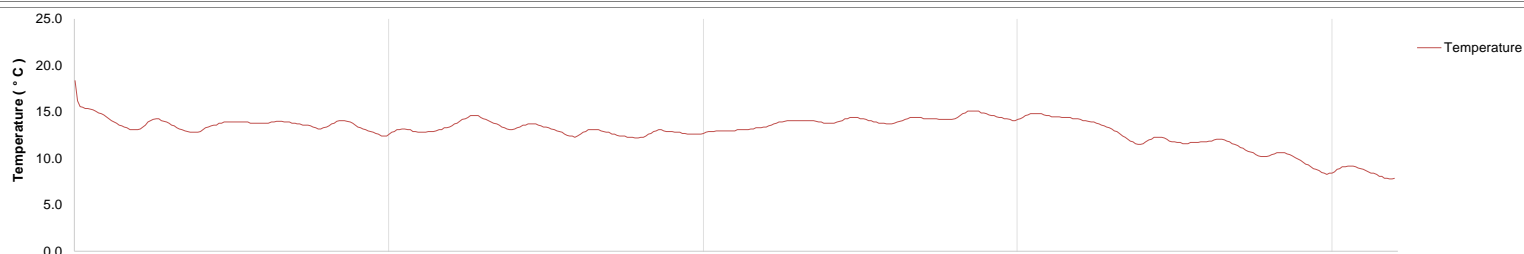
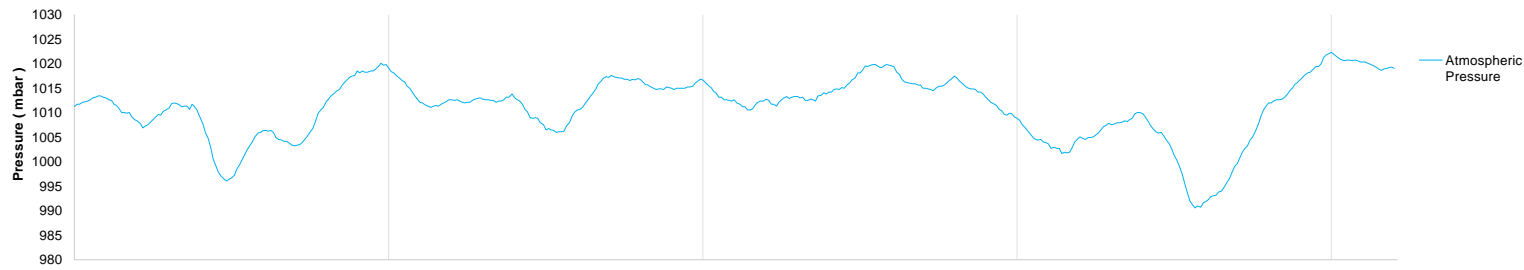
Client:
Hall Construction Services Ltd

Minimum / Maximum Table		
Parameter	Minimum	Maximum
CH ₄ (% v/v)	0.0	0.3
CO ₂ (% v/v)	0.0	11.2
O ₂ (% v/v)	0.0	20.4
Hydrogen Sulphide (ppmv)	0	0
Carbon Monoxide (ppmv)	0	2
Atmospheric Pressure (mbar)	991	1022
Borehole Pressure (mbar)	992	1023
Temperature (° C)	5.6	16.4
Flow (l/hr)	-0.03	0.03

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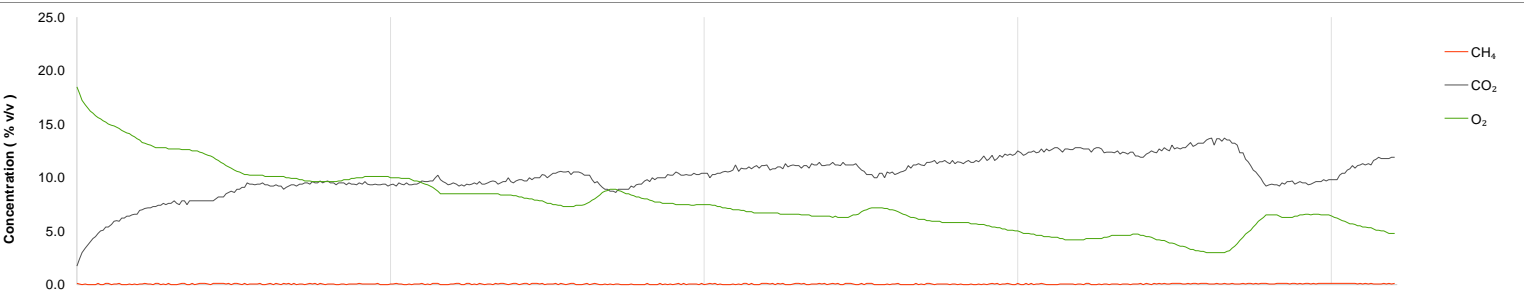
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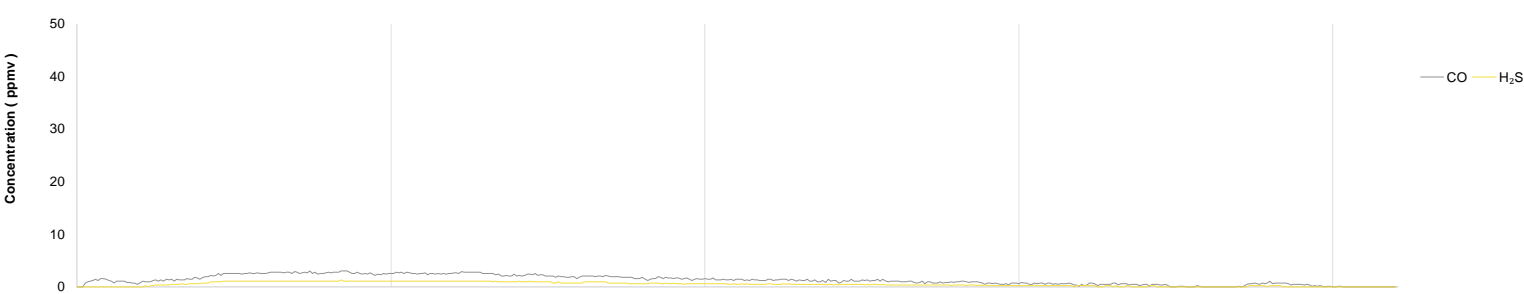
Title:
MW2A-05 - Time Series Graphs

Project:
GGS3070 - Skelton Grange, Phase 2

Client:
Hall Construction Services Ltd



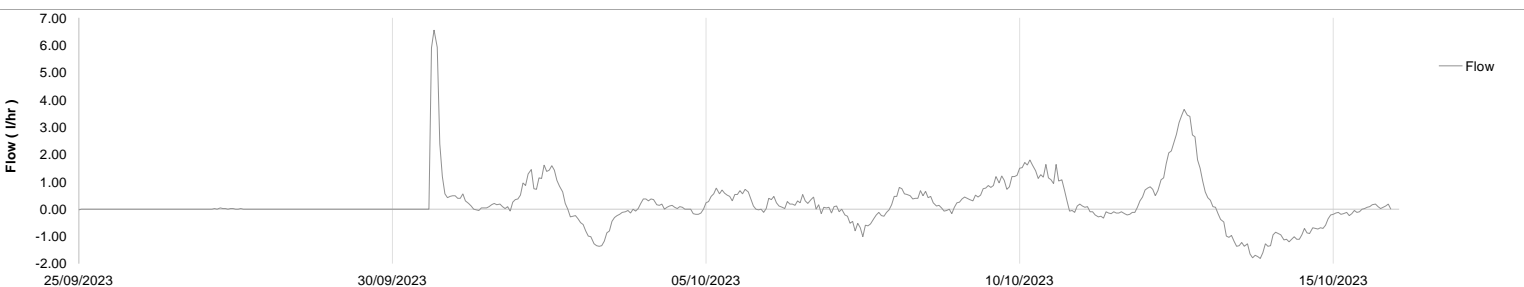
Minimum / Maximum Table		
Parameter	Minimum	Maximum
CH ₄ (% v/v)	0.0	0.2
CO ₂ (% v/v)	1.7	13.7
O ₂ (% v/v)	3.0	18.5
Hydrogen Sulphide (ppmv)	0	1
Carbon Monoxide (ppmv)	0	3
Atmospheric Pressure (mbar)	991	1022
Borehole Pressure (mbar)	991	1022
Temperature (° C)	7.8	18.4
Flow (l/hr)	-1.79	6.56



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Ground Gas Verification (Post-Earthworks)

Phase 2A Development at Skelton Grange, Leeds

^{2.1} Surface emissions survey

GGs undertook 1 no. surface emissions survey of the site for methane (to ppm level) on 18th October 2023. The results have been plotted using QGIS Software and are presented in on the following page. The surface emission survey data includes date & time, GPS co-ordinates and concentrations of methane. The raw survey data is presented in Appendix F.

The majority of emissions were within expected variation of typical ambient air measurements. The maximum concentration of methane detected during the surveys was 23ppmv. During the surface emissions survey, GGS noted landfill odours towards the south-east of the site. The wind speed was 14mph in a westerly direction during the surface emissions survey.



Rev.	Date	Dwn.	Description	App'd
0	23/10/2023	EC	FINAL	JD

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Title:
Surface Emissions Survey

Project: GGS3070 Skelton Grange Phase 2 post-earthworks - Phase 2A

Drawing No:
GGS3070_SES_18.10.2023

Notes:
A surface emissions survey was completed on the 18th October 2023. The results of the survey were analysed using GIS software and plotted as maximum concentrations within 5m (diameter) grid squares.

Key:
— Approximate site boundary

Experts in Continuous Monitoring

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4.4 Flux box tests

GGs undertook 4 No. flux box tests on 18th October 2023 at the site. At the time, the atmospheric pressure was falling from 999mbar to 996mbar over a 2-hour period. The monitoring records and results for the flux box tests are presented in Appendix K.

Targeted flux box locations were selected following consideration of the surface walkover survey results, on-site observations and monitoring well gas concentrations. As no significantly elevated methane concentrations were observed in the surface emissions survey, flux box tests were undertaken systematically, at evenly spread locations across the site.

A summary of the flux box test results is presented in Table 4.3 below, whilst the full flux box test records are presented in Appendix K. The only discernible soil flux evident was carbon dioxide at FB03 and FB04, however, the calculated fluxes at these locations are still considered very low.

Table 4.3 Summary of flux box test results for October 2023

Flux Box ID	Maximum CH ₄	Maximum CO ₂	Methane flux (mg/m ² /s)	Carbon dioxide flux (mg/m ² /s)
FB01	2.5	470	<0.01	<0.01
FB02	2.6	394	<0.01	<0.01
FB03	2.4	379	<0.01	0.02
FB04	2.5	478	<0.01	0.08

4.5 Dissolved gas analysis

The laboratory analysis results for the groundwater sampling undertaken at the site have been summarised in the table below. The full laboratory results and certificates can be found in Appendix G.

Table 4.2 Groundwater analysis results

Monitoring Well	Units	CH ₄	CO ₂	Inferred CH ₄ saturation #	Inferred CO ₂ saturation #
MW2A-04	ug/l	3	>317526*	<0.1%	>21.9%*
MW2A-05	ug/l	2	>368309*	<0.1%	>25.4%*

* > = Results above calibration range, the result should be considered the minimum value.

Based on saturation levels of 22mg/l and 1450mg/l for CH₄ and CO₂ at a temperature of 25°C at one atmosphere (101.325 kPa)

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5 Generic Qualitative Ground-Gas Risk Assessment

3.5 Methane and carbon dioxide

As an initial approach to GGS' risk assessment, GGS has undertaken a generic screening assessment using the maximum concentrations of methane and carbon dioxide which have been identified within the monitoring locations at the Site (MW2A-01 to MW2A-06) during the recent periodic and continuous monitoring during September and October 2023, along with maximum positive flow as per NHBC guidance .

The hazardous gas flow rates have been calculated by multiplying the relevant gas concentration ((% v/v)/100) by the flow rate (litres per hour).

Table 5.1 and Table 5.2 below summarises hazardous gas flow rates calculated using gas monitoring data on a borehole by borehole basis as per the NHBC traffic light system. The maximum concentrations of gas recorded and peak flow measurements in the monitoring wells have been used. If no steady state flows were observed, then a flow rate of 0.1 litres per hour (l/hr) has been used.

Table 5.2 NHBC Traffic Light Classification for methane

Boreholes	General Response zone stratum	Maximum methane concentration (% by volume)	Maximum flow rate (L/hr)	Hazardous Gas Flow Rate (L/h)	NHBC Traffic Light Classification
MW2A-01	Made Ground (CLAY)	0.3	2.14	0.0021	Green
MW2A-02	Made Ground (CLAY)	0.3	<0.1	0.0003	Green
MW2A-03	Made Ground (CLAY)	0.1	<0.1	0.0001	Green
MW2A-04	Made Ground (CLAY)	0.3	0.03	0.0001	Green
MW2A-05	Made Ground (CLAY)	0.3	6.56	0.0197	Green
MW2A-06	Made Ground (CLAY)	0.2	0.1	0.0002	Green

*Classification advanced from Green to Amber 1 due to gas concentrations exceeding 1.0% methane.

** Classification advanced from Green to Amber 2 due to gas concentrations exceeding 5.0% methane.

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Table 5.3 NHBC Traffic Light Classification for carbon dioxide.

Boreholes	General Response zone stratum	Maximum carbon dioxide concentration (% by volume)	Maximum flow rate (L/hr)	Hazardous Gas Flow Rate (L/h)	NHBC Traffic Light Classification
MW2A-01	Made Ground (CLAY)	15.1	2.14	0.3231	Amber 2**
MW2A-02	Made Ground (CLAY)	4.8	<0.1	0.0048	Green
MW2A-03	Made Ground (CLAY)	9.7	<0.1	0.0097	Amber 1*
MW2A-04	Made Ground (CLAY)	11.2	0.03	0.0034	Amber 2**
MW2A-05	Made Ground (CLAY)	13.7	6.56	0.8987	Amber 2***
MW2A-06	Made Ground (CLAY)	9.6	0.1	0.0096	Amber 1*

*Situation advanced from Green to Amber 1 due to gas concentrations exceeding 5% carbon dioxide.

**Situation advanced from Green to Amber 2 due to gas concentrations exceeding 10% carbon dioxide.

**Situation advanced from Amber 1 to Amber 2 due to gas concentrations exceeding 10% carbon dioxide.

With respect to methane and carbon dioxide, the generic screening assessment indicates that the classification for the Phase 2A area (up to 5m bgl) is Amber 2 as per the NHBC traffic light system.

GGs note that the updated NHBC¹⁶ guidance issued in 2023 advises that the approach should now be as described in the current British Standard (BS8485¹⁷), which uses the Modified Wilson and Card classification system (See Table 5.4). Although the purpose of this report is to demonstrate that there has been no change in the classification of the site, in order to follow current guidelines, GGS have also assessed the site in line with BS8485.

¹⁶ NHBC (2023). Hazardous ground gas – an essential guide for housebuilders. NF94. April 2023.

¹⁷ BSI (2019). Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BS8485:2015+A1:2019.

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Table 5.4 Modified Wilson and Card classification system

Hazardous gas flow rates	Risk Classification	Characteristic Situation
<0.07	Very Low Risk	1
<0.7	Low Risk	2
<3.5	Moderate Risk	3
<15	Moderate to High Risk	4
<70	High Risk	5
>70	Very High Risk	6

Table 5.5 below summarises hazardous gas flow rates and the Characteristic Situation calculated using the maximum gas concentration and maximum positive steady flow measured during all continuous monitoring completed at The Site to represent 'worst possible' conditions.

Table 5.5 Gas Screening Value Calculation from all monitoring completed at The Site

Maximum CH ₄ concentration (% v/v)	Maximum CO ₂ concentration (% v/v)	Maximum steady state flow rate (L/hr)	Hazardous CH ₄ Flow Rate (L/hr)	Hazardous CO ₂ Flow Rate (L/hr)	Characteristic Situation (CS)
0.3	15.1	6.56	0.02	1.0	3

With respect to carbon dioxide and methane, the generic screening assessment indicates that the 'Worst Possible' classification is CS3, or moderate risk.

Tables 5.6 and 5.7 below summarise hazardous gas flow rates and Characteristic Situations calculated on a borehole-by-borehole basis for methane and carbon dioxide. These are calculated using maximum concentration and worst-case steady flow measured at The Site to represent 'worst feasible' based on a borehole-by-borehole assessment as per BS8485. Note that where maximum flow rates are recorded as <0.1 l/hr, a flow rate of 0.1 l/hr has been used to calculate GSV's.

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Table 5.6 Gas Screening Value Calculations for Characteristic Situations on a borehole-by-borehole basis for methane

Monitoring Location	Max. positive Steady Flow Rate (l/hr)	Max. CH ₄ (% v/v)	Hazardous CH ₄ Flow Rate (L/hr)	Response Zone (mbgl)	Characteristic Situation (CS)
MW2A-01	2.14	0.3	0.0021	1.00 – 3.00	1
MW2A-02	<0.1	0.3	0.0003	1.00 – 5.00	1
MW2A-03	<0.1	0.1	0.0001	1.00 – 3.00	1
MW2A-04	0.03	0.3	0.0001	1.00 – 5.00	1
MW2A-05	6.56	0.3	0.0197	1.00 – 3.00	1
MW2A-06	0.1	0.2	0.0002	1.00 – 5.00	1

Table 5.7 Gas Screening Value Calculations for Characteristic Situations on borehole-by-borehole basis for carbon dioxide

Monitoring Location	Max. positive Steady Flow Rate (l/hr)	Max. CO ₂ (% v/v)	Hazardous CO ₂ Flow Rate (L/hr)	Response Zone (mbgl)	Characteristic Situation (CS)
MW2A-01	2.14	15.1	0.3231	1.00 – 3.00	2
MW2A-02	<0.1	4.8	0.0048	1.00 – 5.00	1
MW2A-03	<0.1	9.7	0.0097	1.00 – 3.00	1
MW2A-04	0.03	11.2	0.0034	1.00 – 5.00	1
MW2A-05	6.56	13.7	0.8987	1.00 – 3.00	3
MW2A-06	0.1	9.6	0.0096	1.00 – 5.00	1

With respect to methane and carbon dioxide, the generic screening assessments on borehole-by-borehole basis indicate that the classification for the Site is CS3 as per BS8485.

It is also important to note that the hazardous gas flow rates take no account of the site-specific conceptual site model or other lines of evidence. The above assessment does not consider gases other than methane and carbon dioxide. It is therefore prudent to consider the Site in further detail and in the context of the conceptual site model as discussed in the next section.

5.2 Trace Gases

GGs also undertook periodic and continuous monitoring of carbon monoxide (CO) and hydrogen sulphide (H₂S) at the Site. These are trace gases that are frequently associated with ground contamination and therefore are key indicators in a ground-gas risk assessment.

5.2.1 Hydrogen Sulphide

Hydrogen sulphide is classed as a chemical asphyxiant, similar to carbon monoxide and cyanide gases. It inhibits cellular respiration and uptake of oxygen, causing biochemical

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suffocation. Typical exposure symptoms as indicated by the Health Protection Agency website¹⁸ are given in Table 5.3.

Table 5.8 Effects of hydrogen sulphide poisoning

Concentration in parts per million (ppmv)	SIGNS AND SYMPTOMS
10 – 20	Threshold for eye irritation
50 – 100	Serious eye damage
100 – 250	Loss of smell after 3-15 minutes. Throat stinging.
250	Irritation of mucus membranes, rhinitis, bronchitis, cyanosis, and acute lung injury. Prolonged exposure - pulmonary oedema. Conjunctivitis, photophobia, lacrimation, corneal opacity.
250 – 500	Headache, nausea, vomiting, diarrhoea, vertigo, amnesia, dizziness, apnea, palpitations, tachycardia, hypotension, muscle cramps, weakness, disorientation, coma and pulmonary oedema with risk of death.
530 – 1000	Strong CNS stimulation, tremors, blurred vision, cyanosis, seizures and tachycardia, hyperpnoea followed by respiratory arrest.
1000 – 2000	Rapid collapse, respiratory paralysis, coma asphyxial seizures and death.

The Health & Safety Executive¹⁹ states that the workplace exposure limits for hydrogen sulphide during a short-term exposure limit (STEL) - 15 minute reference period is 10ppmv (14 mg m⁻³) and a long term exposure limit is (LTEL) - 8 hour reference period is 5 ppmv (7 mg m⁻³).

¹⁸ www.hpa.nhs.uk/webw/HPAweb&Page&HPAwebAutoListDate/Page/1219130166334?p=1219130166334 which also references TOXBASE: Hydrogen sulphide, 2004 and Air Quality Guidelines for Europe. World Health Organization Regional Office for Europe, Copenhagen WHO Regional Publications, European Series, No. 91, Second Edition, 2000.

¹⁹ Health & Safety Executive. EH40/2005 Workplace Exposure Limits 2005. The Stationery Office, London, 2005.

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Hydrogen sulphide concentrations were recorded at up to 1ppmv during the September and October 2023 monitoring period. This is below the STEL and LTEL and therefore does not require further consideration.

5.2.2 Carbon Monoxide

Carbon monoxide (CO) is a colourless and tasteless gas but is highly toxic. The most common symptoms of carbon monoxide poisoning may resemble other types of poisonings and infections (such as influenza) including nausea, dizziness, headache, feeling weak and lethargy.

The Health & Safety Executive states that the workplace exposure limits for carbon monoxide during a short-term exposure limit (STEL) -15 minute reference period is 200 ppmv (232mg m^{-3}) and a long term exposure limit is (LTEL) - 8 hour reference period is 30 ppmv (35mg m^{-3}).

Carbon monoxide concentrations were recorded at up to 10 ppmv during the September and October 2023 monitoring period. This is both below the short term and long term workplace exposure limit. However, due to the nature of the site (previous coal mine workings) carbon monoxide will be considered further in Section 7 of this report.

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² Detailed Ground-Gas Risk Assessment

Given the ground-gas concentrations recorded at the Site and the previous uses of the Site, it is considered prudent to carry out a detailed ground-gas risk assessment, which considers the wider site context, including the conceptual site model and all the data gathered during previous site investigations and the GGS monitoring period in September and October 2023, using a lines of evidence approach.

^{2.1} Conceptual Site Model Discussion

6.1.1 Potential ground-gas receptors

The potential ground-gas receptors at the Site are the proposed residential properties and occupants, structures and services, other property, as well as site workers, visitors and future site users.

6.1.2 Potential ground-gas migration pathways

On site made ground

Made ground was encountered within all exploratory holes of AEG Ltd 2019 site investigation of the Phase 2 area, with colliery spoil encountered at up to 64m bgl. Made ground descriptions included grey sandy clay with gravel of siltstone and coal, stiffy grey clay with gravel of mudstone and occasional coal and frequent mudstone cobbles (Opencast colliery spoil).

The monitoring wells in the Phase 2A site under investigation in this report, were installed in September 2023 and include Made Ground that consists of predominantly Clay, some Mudstone or Sand, and evidence of coal within the top 5.00m bgl.

The predominantly clayey made ground beneath the site may create low permeability strata with localised features and zones which are unlikely to allow significant upward ground-gas migration towards the residential development. The thickness of this made ground layer is also likely to limit direct vertical ground-gas migration from known features, such as a fault running through the Site from west to east, or underlying coal seams.

The site has been subject to several phases of ground investigation including several boreholes and monitoring well installations which have been driven through the made

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ground and as far as the bedrock (Coal measures). If poorly decommissioned, these have the potential to create direct vertical pathways for ground gas migration.

Off Site made ground

During previous investigations, made ground has been encountered to the east and south of the Phase 2 area at up to 67m bgl, but with the majority being encountered up to between 20 and 40m bgl.

Made ground descriptions included grey sandy gravelly clay (gravel comprised of siltstone and coal), stiff grey gravelly slightly cobbly clay (gravel comprised of mudstone and occasional coal, cobbles comprised of mudstone and colliery spoil).

Most of the made ground encountered within the surrounding areas from previous investigations has been described as opencast backfill. This comprises of gravelly clay with occasional cobbles and boulders. The gravel is made of mudstone, sandstone and coal with some fragments from construction works. In places it is layered with gravels and sandy clay.

There is also an area infilled with PFA to the south of the Phase 2 area which is raised 20 m above original ground level and underlain by the infilled colliery spoil, it was measured at up to 65 mbgl in the Lithos 2015 monitoring well, PH103A. The PFA is described as grey sandy silt with various amounts of gravel.

Although the off-site made ground comprised mostly of cohesive clayey and silty material, there is the possibility of limited migration through sandy and gravelly lenses / pockets.

Solid geology

The 1:50,000 British Geological Survey (BGS) map for the area indicates bedrock of Mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation. This bedrock includes frequent coal seams. The previous AEG Ltd investigation encountered the coal measures strata underlying the Phase 2 area within CCP201 to CP211 at depths between 19 and 64m bgl. BH206 encountered bedrock at 6m bgl, however, this location is almost on the boundary of the site and therefore likely to be on the very edge of the former colliery area. Coal seams were encountered in CP206, CP208, CP209, CP210 and CP211 at depths between 23 and 70m bgl. The thickness of these coal seams was between 0.1 and 1.9m. There are likely fissures as well as a faulted zone running from west to east across the

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site in the bedrock that can act as potential migration pathways. Because of the legacy mining activity, deeper coal seams are likely to have been worked and this could create pathways for any potential mines gas to migrate vertically and laterally towards the Site.

6.1.1 Potential ground-gas sources

Off-site made ground

The likely off-site sources of ground-gases identified are the landfill operations located to the south-east of the site, the PFA mound that is located to the south of the site and the further extent of backfilled opencast colliery spoil to the east, north and south of the site (likely of similar composition to the on-site made ground).

The PFA mound to the south is raised 20 m above original ground level and underlain by the infilled colliery spoil, it was measured at up to 65 mbgl in the Lithos 2015 monitoring well, PH103A. The PFA is described as grey sandy silt with various amounts of gravel; it contains various damp spots and layers of cemented silts.

The landfill site to the south-east of the Phase 2A area reportedly underwent ground-gas monitoring before being granted a landfill permit by the Environment Agency; they recorded carbon dioxide concentrations of up to 40% v/v but no flow. It was concluded that the gas was originating from the opencast backfill and solid geology. It is understood this landfill is lined and has an active gas management system.

On-site made ground

The prominent on-site source of ground-gas is the made ground associated with the opencast colliery spoil. Previous site use as an opencast coal mine and subsequent backfilling with colliery spoil has created made ground at depths of up to 64 mbgl. Colliery spoil is described as grey sandy clay with gravel of siltstone and coal, stiff grey clay with gravel of mudstone and occasional coal and frequent mudstone cobbles. The monitoring completed by JPG and GGS within 31 No. on site monitoring wells in 2019 and 2020 identified carbon dioxide levels at up to 28.9% v/v and methane at up to 10.4% v/v.

Solid Geology

Pennine Lower Coal Measures are located at this site (coal seams that have been extracted by opencast methods include: 2nd & 3rd Brown Metals. Middleton Little, Unnamed 2AC and

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Middleton Main). Extensive previous workings are known to have occurred at the site including open cast mining. Potential for pathways include poorly decommissioned boreholes and the faulted zone that occurs at the site from west to east.

6.1.2 Gas Migration Mechanisms

In order for a pollutant linkage to be established from ground-gases, a migration mechanism is required to drive those gases towards a receptor.

Gas will migrate via diffusion (for example moving to areas of low gas concentrations around a site) and/or pressure differences in the soil. For migration to be sustained, the gas should be continuously replaced by new generation. There are three principal factors influencing gas migration:

- Pressure differential (generation of gas from within the source and changes in atmospheric pressure or other environmental factors);

- Diffusion along gas concentration gradients;

- Transport, in dissolved form, within liquids.

Pressure: Gases actively generating in the ground (waste, natural soils or made ground) can create localised areas of increased pressure. As this pressure rises above surrounding soil pressures, the gas will move outwards to areas of lower pressure. The variation in pressure or 'pressure differential' throughout the soils results in gases moving from areas of high pressure to areas of low pressure. The ground soils can also be heavily influenced by environmental effects such as atmospheric pressure changes and rising water levels.

As atmospheric pressure changes, the near surface soil pressures respond by trying to equalise to the new pressure. Where soil permeability is high, in sands for instance, this can occur freely and quickly and no significant differential pressure is observed. However, where there is a restriction in pressure equilibrium (such as in cohesive materials), a lag time is typically observed and a differential pressure is temporarily created. It is this pressure difference that causes the flow of gas and can be both positive (out of the ground) and negative (into the ground) and is typically variable. This process is known as 'barometric pumping'.

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A rising water level will have the effect of displacing a significant portion of gas filled pore spaces which can induce an increased pressure from the surface of the water level, generally displacing gases vertically, although migration can occur in other directions particularly where vertical escape of gas is restricted. This is what we term the 'piston effect'.

Diffusion: Diffusion describes a gas's natural tendency to reach a uniform concentration in a given space, whether it is a room or the earth's atmosphere. Gases in soils diffuse from areas of high gas concentrations to areas with lower gas concentrations.

Transport, in dissolved form, within liquids: Many gases are soluble within liquids; the degree of solubility is related to the type of gas and the pressure and temperature of the environment in which the gases are present. The transport of dissolved gases in liquid from a high pressure environment to a low pressure environment is likely to result in gases coming out of solution, "degassing".

Flow (Permeability): Gases will migrate according to the location of pathways of least resistance, or highest permeability. Permeability is a measure of how effectively gases and liquids will flow through connected spaces or pores in refuse and soils. Dry, sandy soils are highly permeable (many connected pore spaces), while moist clay tends to be much less permeable (fewer connected pore spaces).

The assessment of monitoring data below will provide the likely dominant drivers for ground-gas below.

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6.1.3 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 above²⁰. 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 3 on the following pages.

For weather forecasting in the UK, The Meteorological Office²¹ records falling pressure tendency over a 3-hour period, whereby every hour the change in atmospheric pressure over the preceding 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 Department²² 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 3 on the following page/s, which provides time reference/occurrences to atmospheric pressure falling, falling rapidly and/or falling very rapidly.

²⁰ CL:AIRE Technical Bulletin 17, August 2018. Ground Gas Monitoring and 'Worst-Case' Conditions

²¹ https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/library-and-archive/library/publications/factsheets/factsheet_8-shipping-forecast.pdf

²² British Coal Technical Department. 1990. Hazardous Gases Underground: Notes for Guidance NG/9. British Coal Technical Department.

Ground Gas Verification (Post-Earthworks)

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The standard mean sea level pressure (MSLP) in the UK is defined as 1013.25 millibars²³, which provides a common value to compare atmospheric pressure across different locations 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 4.4 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 during the continuous monitoring period is presented in Figure 2 below. Although rising pressure will have a similar distribution to falling pressure, this is listed together.

Table 4.4 Atmospheric pressure regime

Atmospheric Pressure Analysis 25/09/2023 – 16/10/2023	
Range in atmospheric pressure (mbar)	996.4 – 1028.1 (31.7 millibars)
Maximum average rate of fall over an 8-hour reference period	1.56 mbar/hour (27/09/2023 11:35 1016.2mb to 27/09/2023 19:35 1003.8mb)
Maximum change in pressure over a 3-hour period (pressure tendency)	5.6 millibars (27/09/2023 15:35 1010.7mb to 27/09/2023 18:35 1005.0mb)
Most significant atmospheric pressure fall over 8 hours	18.3 millibars over 21 hours (0.87 mbar/hour) (1014.8 12/10/2023 13:35 – 996.5 13/10/2023 10:35).
% time below 1013 (and % time below 1013 and falling)	24.5% (12.7%)

²³ <https://www.metoffice.gov.uk/weather/learn-about/weather/how-weather-works/high-and-low-pressure>

Ground Gas Verification (Post-Earthworks) Phase 2A Development at Skelton Grange, Leeds

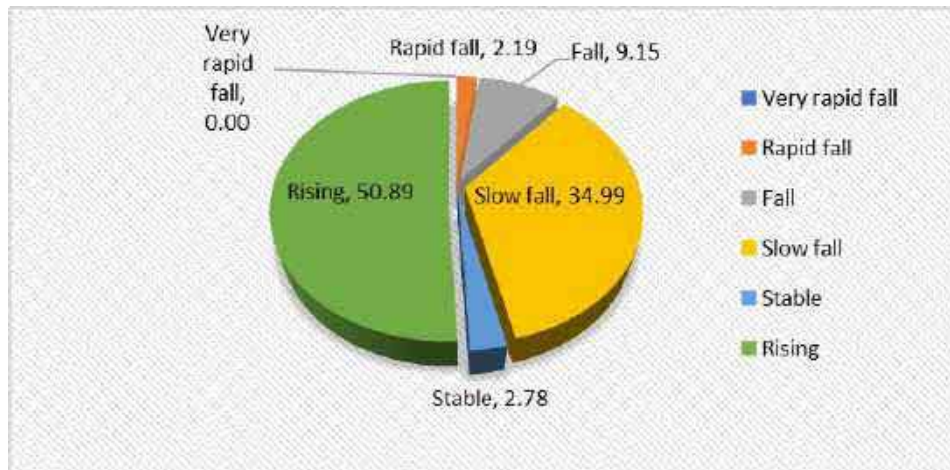


Figure 2 % distribution of 3-hour pressure tendency between 25th September and 16th October 2023.

The atmospheric pressure is considered variable over the three-week period, with both rising and falling events occurring. The continuous monitoring period has captured two rapid falling pressure events, which also resulted in prolonged falls in pressure over 8 hours.

Ground Gas Verification (Post-Earthworks)
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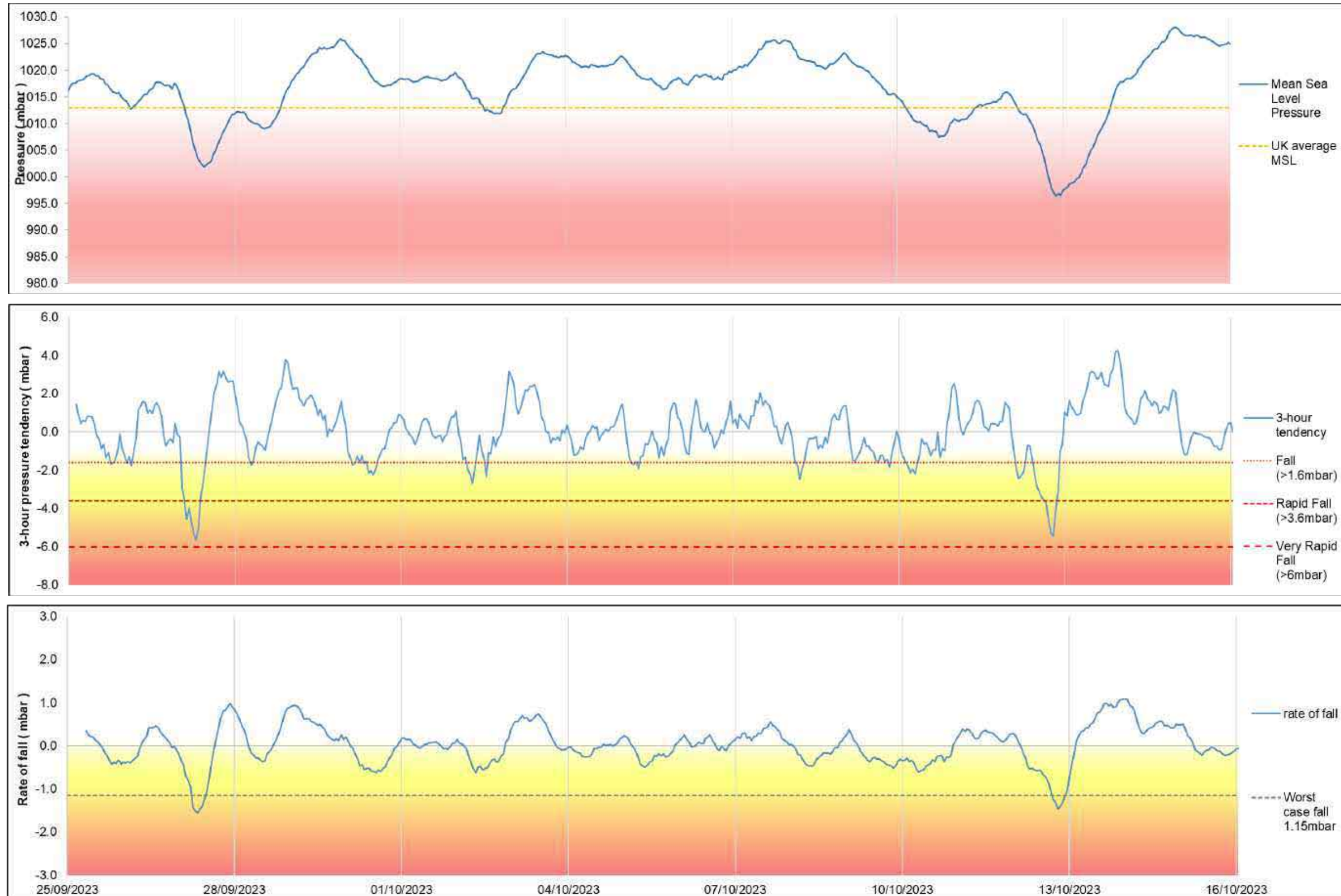


Figure 3 Time series atmospheric pressure presented with reference to standard UK mean sea level pressure, 3-hour pressure tendency and a maximum rate of fall averaged over an 8-hour reference period

Ground Gas Verification (Post-Earthworks)

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1.1 Ground-Gas Risk Assessment Discussion and Summary

The initial Generic Screening Risk Assessment, with respect to methane and carbon dioxide for the upper 5m of the Site, indicates that the classification of Amber 2 as per the NHBC traffic light system, or CS3 using BS8485 guidance.

Below is a discussion and consideration of all the evidence and monitoring data, using ‘a lines of evidence’ approach to consider each of the potential gas sources and pollutant linkages that have been identified at the preliminary conceptual model stage. As such, key points of the discussion address the potential for vertical ground-gas migration that could lead to an adverse impact occurring on the proposed residential dwellings.

Below is a comparison of the maximum gas results observed in the shallow monitoring wells before (BH206, CP201 – CP205, WS201 – WS207) and after (MW2A-01 – MW2A-06) the earthworks phase at the site.

Table 6.2 Maximum gas results

	Pre-earthworks	Post-earthworks
Methane	4.1% v/v (CP203)	0.3% v/v (MW2A-01, MW2A-02, MW2A-04 and MW2A-05)
Carbon dioxide	19.7% v/v (WS207)	15.1% v/v (MW2A-01)
Peak positive flow rate	4.9 l/hr (CP203)	6.56 l/hr (MW2A-05)
Carbon monoxide	5ppmv (WS103)	10ppmv (MW2A-01)
Hydrogen sulphide	2ppmv (WS120)	1ppmv (MW2A-01 and MW2A-05)

The following key points were observed in the post-earthworks monitoring:

Methane concentrations were absent in many locations and where present, were below 1%.

Carbon dioxide concentrations have been similar, if not lower, to concentrations observed in previous assessments at the site, indicating that the carbon dioxide source is likely to be the organic materials within the made ground (I.e. coal measure strata mixed in within the clayey soils).

Flow rates remained low during the periodic monitoring of wells MW2A-01 to MW2A-06, and during the continuous monitoring at MW2A-04. The 2.14 l/hr and 6.56 l/hr peak readings at MW2A-01 and MW2A-05, respectively, were associated with

Ground Gas Verification (Post-Earthworks)

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periods of falling atmospheric pressure (i.e. barometric pumping) rather than steady gas generation.

Oxygen depletion was recorded at <0.1% v/v in several of the monitoring well locations, likely due to displacement by methane and carbon dioxide, as well as oxygen consumption by chemical and biological processes.

Concentrations of carbon monoxide and hydrogen sulphide have been observed in the recent monitoring period at similar ranges as the pre-earthworks monitoring.

The ground gas behaviour observed is similar to the behaviour observed in the pre-earthworks monitoring, with ground gas concentrations oscillating and responding to changes in atmospheric pressure.

The ground gas regime observed in the monitoring undertaken in September and October 2023 (post-earthworks), suggests a similar regime to the monitoring undertaken in September and October 2020 (pre-earthworks). The oscillating concentrations and response to atmospheric pressure suggests that, although ground gases are present at significant volumetric concentrations within the limited standpipe volume, these have a low generation potential as they are easily dispersed and diluted from the monitoring wells by rising atmospheric pressure.

The source of the observed methane and carbon dioxide is likely from the organic material within the Made Ground (coal fragments and carbonates associated with open cast colliery within the clay matrix). It is likely that the low pore space provided by the shallow geology (Made ground - Clay) also allows for relatively low volumes of methane and carbon dioxide to accumulate into elevated concentrations, particularly within the unsaturated zone of the monitoring wells.

On a large scale, the on-site Made Ground is homogenous and consists of gravelly clay with the gravel comprising mixed lithology including coal fragments.

The surface emissions survey did not identify any significant methane emissions from the surface, highlighting that vertical migration of methane is either extremely low, or the volume of methane migrating vertically is low enough to dilute and disperse almost immediately upon contact with the atmosphere. Furthermore, GGS undertook flux box tests across the site, and no significant flux of methane or carbon dioxide was observed during these tests.

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The dissolved gas analysis from water within MW2A-04 and MW2A-05 highlighted that there is very little methane dissolved within the groundwater. However, significant quantities of carbon dioxide are present within the groundwater, which is in line with the ground gas concentrations observed within the free headspace at these locations. Both the gas concentrations and dissolved gas analysis highlight that the made ground is likely quite rich in carbon dioxide, but with little generation occurring as evidenced by the flow readings. The source of carbon dioxide is likely a result of physio-chemical and biological activity associated with the reduction of organic and carbonaceous materials within the made ground.

The observed flow rates in the shallow monitoring wells are low and, where present, directly driven by changes in atmospheric pressure. The flow is therefore likely to have been caused by the gas pressure in the monitoring installation trying to reach equilibrium with atmospheric pressure. The largely cohesive clayey soils within the monitoring well response zone have likely isolated these monitoring wells from atmospheric conditions, resulting in a slightly greater pressure within the monitoring well compared to the atmosphere during periods of rapid falling atmospheric pressure. When the gas tap or flow valve is opened for a flow measurement, the gas within the monitoring well escapes through the gas tap into atmosphere in order to reach equilibrium, resulting in a positive flow reading. During periods of high or increasing atmospheric pressure, the opposite is also seen to occur with negative flow being recorded as atmospheric air enters the monitoring wells through the opened gas taps. Positive as well as negative pressure was observed during the monitoring period, provides further evidence that flow readings are likely the result of stabilising monitoring well pressure, rather than gas generation.

The deep dynamic compaction engineering work recently undertaken at the site is likely to have further reduced the potential of vertical ground gas migration from deeper potential sources of gas (such as the underlying coal measures).

The ground gas behaviour observed during the continuous monitoring period in September and October 2023 is commensurate with a pattern of very low gas generation, with atmospheric pressure being a key driver. The trend of increasing concentrations of ground gases during periods of decreasing atmospheric pressure, and decreasing ground gas concentrations during periods of increasing atmospheric pressure is evident in the majority of the continuously monitored locations. The monitoring wells are also likely providing a

Ground Gas Verification (Post-Earthworks)

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suitable space / void for the ground gases to diffuse within and settle, and also dissolve within the groundwater.

The carbon monoxide and hydrogen sulphide concentrations observed at the site are considered relatively low and likely originating from the oxidation and reduction of organic and sulphuric materials within the Made Ground at the site (re-engineered opencast colliery spoil).

Given the conceptual site model, it is considered that the ground-gases identified are principally associated with the on-site Made Ground.

From the ground-gas monitoring completed and the lines of evidence used, GGS consider that the gas generation potential at the site is low, with atmospheric pressure being the key driver of ground gas concentrations. Evidence from all ground gas monitoring and the geology of site suggest that the potential for lateral and vertical gas migration is low within the cohesive clayey made ground. The reservoir volume of ground gases within the made ground materials is also likely to be minimal, given the cohesive nature of the made ground.

In summary the following key points are considered in order to appropriately characterise the site:

Potential receptors include future onsite residential development, future residents and site workers;

Ground gas migration between potential sources and receptors is considered low;
Potential ground gas sources identified on site within the extensive made ground material with low generation potential;

The observed methane and carbon dioxide concentrations are elevated and have accumulated within monitoring wells during periods of low and falling atmospheric pressure. Oxygen depletion at <0.1% v/v has also been observed across the site. Therefore, there is potential for hazardous concentrations of ground gases to accumulate within confined spaces or poorly ventilated small spaces;

The flow readings observed are likely driven by changes in atmospheric pressure, and not significant generation;

The cohesive made ground (re-engineered opencast colliery spoil) across the site is understood to be at least 10 metres thick and retards the potential for rapid vertical

Ground Gas Verification (Post-Earthworks)

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and lateral migration of ground gases within the made ground itself or from the coal measures beneath the site and the identified off-site potential sources of ground gases.

Given the above and previous discussions with JPG Group and the NHBC, GGS considers that the existing site classification of Amber 2 as per the NHBC traffic light system (or CS3 as per BS8485), as remains valid for the shallow made ground (up to 5m bgl) at the site.

Additionally, the required gas resistant membrane for Amber 2 / CS3 sites, assuming these are properly installed and protected from damage, is considered sufficient to address the low level carbon monoxide concentrations detected within the monitoring wells along with potential Radon gas and oxygen depletion.

It should be noted that previous investigations highlighted that there are hazardous concentrations of ground gases present within the Pennine Lower Coal Measures below and around the Phase 2A development area, and possibly within the off-site made ground material adjacent to the Phase 2A development area. Therefore, any future work undertaken at the Site which may provide pathways for vertical or lateral migration of ground gases from these sources should be suitably considered and appropriately managed.

^{1.1} Revised Conceptual Model

A revised conceptual model for the Site is presented in Table 6.3 below which considers the findings of previous reporting, potential sources and findings of the investigation and monitoring.

A conceptual model schematic is presented in Appendix I. The Qualitative Risk Classification Matrix is presented in Appendix J.

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Table 6.3 Revised Conceptual Model

Source	Principle Contaminants	Pathway	Receptor	Hazard Assessment	Discussion	Mitigation action
On-Site Made Ground (Open Cast Colliery Spoil)	Methane	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Low likelihood R = Moderate risk	Methane has been detected on site up to a maximum of 0.3% v/v within the shallow monitoring well locations (up to 5m bgl). Flow rates remained low throughout the recent monitoring period, with a maximum of 6.56l/hr recorded, however this driven by barometric pumping. The shallow geology (CLAY) is likely to offer very small pore spaces for significant volumes of methane to migrate within the on-site made ground, and the elevated concentrations are likely a result of the very small pore spaces available for dilution of the methane. The potential for methane generation is considered low within the on-site made ground.	Appropriate site design and preparation to interrupt potential vertical ground gas migration including correct decommissioning of boreholes. Appropriate construction planning to minimise and/or prevent penetrations of site cover layer. Gas protection measures required for an Amber 2 / CS3 site. Safe system of work required for construction workers in line with confined space regulations.
	Carbon dioxide	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Low likelihood R = Moderate risk	Carbon dioxide has been detected within all shallow monitoring well locations at concentrations of up to 15.1% v/v. The observed carbon dioxide concentrations within the shallow monitoring well locations are elevated and have accumulated within monitoring wells during periods of low and falling atmospheric pressure. The shallow geology (CLAY) is likely to offer very small pore spaces for significant volumes of carbon dioxide to migrate within the on-site made ground, and the elevated concentrations are likely a result of the very small pore spaces available for dilution of the carbon dioxide. The made ground at the Site is the likely source of the elevated carbon dioxide concentrations observed, and hazardous concentrations of ground gases could accumulate within confined spaces given the right conditions.	Appropriate site design and preparation to interrupt potential vertical ground gas migration including correct decommissioning of boreholes. Appropriate construction planning to minimise and/or prevent penetrations of site cover layer. Gas protection measures required for an Amber 2 / CS3 site. Safe system of work required for construction workers in line with confined space regulations.
	Trace gases (Hydrogen sulphide and Carbon monoxide)	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Unlikely R = Low risk	The carbon monoxide and hydrogen sulphide concentrations observed within the shallow monitoring well locations at the Site are considered relatively low and likely originating from the organic materials within the made ground at the site (Opencast colliery spoil).	Appropriate site design and preparation to interrupt potential vertical ground gas migration. Appropriate construction planning to minimise and/or prevent penetrations of site cover layer. Gas protection measures required for an Amber 2 / CS3 site. Safe system of work required for construction workers in line with confined space regulations.
	Radon	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future site residents	C = Severe P = Unlikely R = Low risk	Radon may be present in Pennine Lower Coal Measures formation which has been reworked and mixed within the made ground material.	Gas protection measures required for methane and carbon dioxide risk considered sufficient to mitigate risk of Radon. Planned ground engineering works should consider mitigating vertical ground gas migration from deeper horizons where elevated ground gas concentrations are likely to be present. Safe system of work required for construction workers in line with confined space regulations.

Ground Gas Verification (Post-Earthworks)
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Source	Principle Contaminants	Pathway	Receptor	Hazard Assessment	Discussion	Mitigation action
On site bedrock (Pennine Lower Coal Measures Formation)	Methane Carbon dioxide Trace gases (CO, H ₂ S) Radon	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Unlikely R = Low risk	Pennine Lower Coal Measures are located at this site. Extensive previous workings are known to have occurred at the site including open cast mining. Potential pathways include poorly decommissioned boreholes and the faulted zone that occurs at the site from west to east. Coal measures are potential sources of hazardous ground gases, however vertical migration from this source is unlikely at this Site due to at least 10 metres of cohesive made ground above this strata. Evidence of vertical migration of ground gases from coal measures has not been observed during monitoring of shallow monitoring wells.	Gas protection measures required for on site made ground risk considered sufficient to mitigate risk of ground gases from on site bedrock.
Off site made ground (Open Cast Colliery Spoil)	Methane Carbon dioxide Trace gases (CO, H ₂ S) Radon	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Unlikely R = Low risk	It is not possible to distinguish between ground gases observed by on site made ground and off site made ground. However, it is understood the composition of the on and off site made ground is similar (both opencast colliery spoil) and therefore the gas protection measures recommended for the risk of ground gases from the on site made ground should suffice.	Gas protection measures required for on site made ground risk considered sufficient to mitigate risk of ground gases from off site made ground.
Off site made ground (Open Cast Colliery infilled with PFA)	Methane Carbon dioxide Trace gases (CO, H ₂ S)	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Mild P = Unlikely R = Very low risk	It is understood that PFA material is very low in organic content, since the majority of this would have already been incinerated. Therefore it is unlikely this will provide a sufficient source of hazardous ground gases to migrate to the Site. Elevated concentrations of ground gases observed at this location are likely to be sourced from the underlying bedrock or adjacent made ground.	None required.
Off site landfill (operational landfill to the south)	Methane Carbon dioxide Trace gases (CO, H ₂ S)	Inhalation Preferential migration through service ducts / trenches / pilings / deep drainage	Construction workers, visitors, future buildings and infrastructure, future site residents	C = Severe P = Unlikely R = Low risk	Evidence of migration of ground gases from the off site landfill has not been observed during monitoring of shallow monitoring wells.	Gas protection measures required for on site made ground risk considered sufficient to mitigate risk of ground gases from off site landfill.

Ground Gas Verification (Post-Earthworks)

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7 Recommendations

Given the conceptual site model, all the ground-gas monitoring results and the above risk assessment and discussion, GGS considers that the site is no worse than previously identified in this instance and therefore the **Amber 2** NHBC traffic light system classification (or **CS3** as per BS8485) as agreed with the NHBC remains valid.

Based on the current classification, in addition to Amber 2 / CS3 ground-gas protection measures being incorporated into the proposed building design, the following additional measures should be considered:

Avoid or minimise and manage preferential gas migration pathways via services penetrations, piling columns, sewers, service conduits etc;

Avoid or minimise the risk to future site workers within confined spaces within the made ground.

Removal of any preferential pathways created by the existing monitoring locations.

In order for the GGS assessment to remain valid, no excavations should occur beyond 5 metres across the site. Should deeper excavations be required, the lead consultant and regulator should be contacted to determine if further monitoring and assessment is required.

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix A

Site Plan & Monitoring Well Locations

EHELP LEGEND

MW WINDOW SAMPLE BOREHOLE WITH GAS MONITORING WELL INSTALLATION

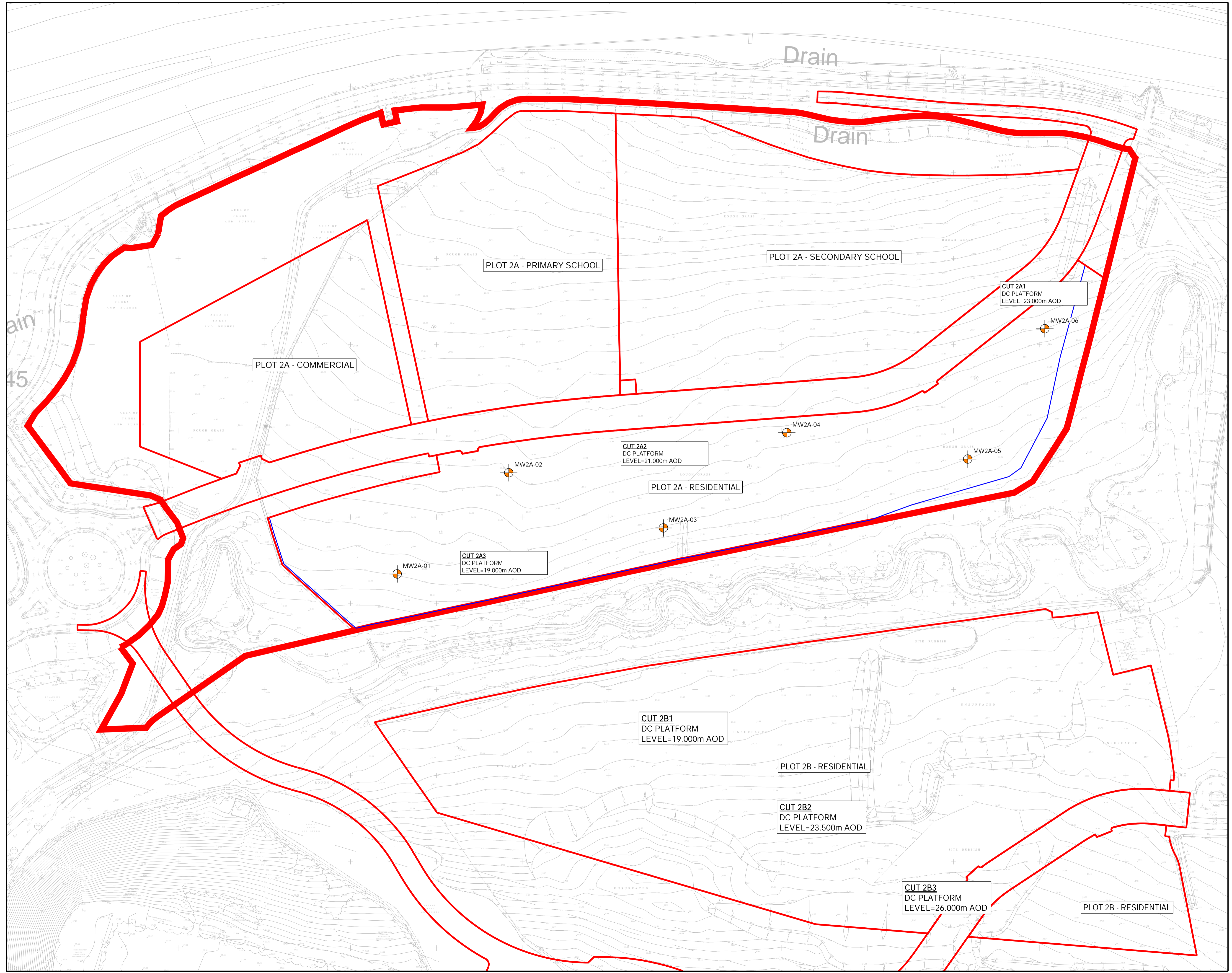
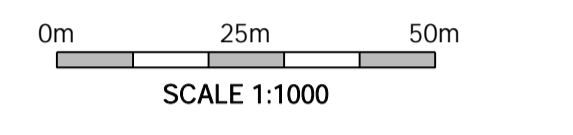
INSTALLATION PIPE DETAILS

MW2A-02, MW2A-04 AND MW2A-06 ARE TO BE INSTALLED TO 5.00M BGL (1.00M PLAIN PIPE, 4.00M SLO TIED).
 MW2A-01, MW2A-03 AND MW2A-05 ARE TO BE INSTALLED TO 3.00M BGL (1.00M PLAIN PIPE, 2.00M SLO TIED).

PLAIN PIPE TO BE LEFT 0.30M ABOVE GROUND TO ALLOW FOR HEADWORK CONSTRUCTION.

DECOMMISSIONING DETAILS

ON COMPLETION OF THE MONITORING, HALLS ARE TO DECOMMISSION THE WELLS BY REMOVAL OF THE PIPEWORK AND FILLING OF THE RESULTANT HOLE WITH BENTONITE AND/OR GROUT.



P04	AS BUILT	17.11.23	JBW	EJS
P03	DRAWING NUMBER UPDATED	24.07.23	JBW	EJS
P02	DECOMMISSIONING DETAIL	23.06.23	JBW	EJS
P01	FIRST ISSUE	13.06.23	JBW	EJS

REV	DESC RIPTION	DATE	CHK	BY
Project SKELTON GATE JUNCTION 45, M1				

Drawing Title
 PHASE 2A: CONTINUOUS GROUND GAS
 VERIFICATION MONITORING WELL
 LOCATION PLAN

INFORMATION

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix B

Monitoring well drilling logs (AEG 2023)



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: 145 South Road, Wignall's Barn, Bretherton, Leyland, PR26 9AJ

Tel: 0191 387 4700
 Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-01	
Client: Hall Construction Services Ltd		Location: E:435327.169 N:430966.992	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 22.720	Start Date: 01/09/2023
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1			22.32		(0.40) 0.40	MADE GROUND (Firm dark sandy slightly gravelly clay with many rootlets and some coal. Gravel is fine to coarse angular to subrounded and includes sandstone).	
1.00-2.00	L2					(2.60)	MADE GROUND (Stiff brownish grey sandy slightly gravelly clay. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone, brick and lustrous coal).	
2.00-3.00	L3			19.72		3.00	Complete at 3.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
01/09/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 3.00m BGL.
01/09/2023	3.00				1.00 - 2.00	87	100	No	
					2.00 - 3.00	77	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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Tel: 0191 387 4700
 Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-02	
Client: Hall Construction Services Ltd		Location: E:435391.893 N:431025.692	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 24.669	Start Date: 01/09/2023
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1					(0.80)	MADE GROUND (Firm dark slightly gravelly silty clay with rootlets. Gravel is fine to coarse angular to subrounded and includes sandstone, brick and coal).	
1.00-2.00	L2			23.87		0.80	MADE GROUND (Stiff to very stiff grey slightly gravelly clay. Gravel is fine to coarse angular to subrounded fine to medium and includes mudstone, brick and lustrous coal).	
2.00-3.00	L3					(2.30)		
3.00-4.00	L4			21.57		3.10	MADE GROUND (Boulder of medium strong grey mudstone).	
				21.37		3.30	MADE GROUND (Brown sand. Sand is fine to medium and includes brick. Gravel is fine to coarse angular and includes brick).	
				21.17		3.50	MADE GROUND (Soft to firm light brownish grey gravelly silt/clay. Gravel is fine to coarse angular and includes coal)	
4.00-5.00	L5					(1.50)		
				19.67		5.00	Complete at 5.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
01/09/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 5.00m BGL.
01/09/2023	5.00				1.00 - 2.00	101	100	No	
					2.00 - 3.00	87	100	No	
					3.00 - 4.00	77	100	No	
					4.00 - 5.00	67	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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 Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-03	
Client: Hall Construction Services Ltd		Location: E:435481.646 N:430993.701	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 22.874	Start Date: 01/09/2023
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1			22.37		0.50	MADE GROUND (Firm dark slightly gravelly silty clay. Gravel is fine to coarse angular to subrounded and includes sandstone, flint and brick).	
1.00-2.00	L2					(2.50)	MADE GROUND (Stiff brownish grey silty gravelly clay. Gravel is fine to coarse angular to subrounded and includes sandstone, flint, mudstone, brick and lustrous coal).	
2.00-3.00	L3			19.87		3.00	Complete at 3.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
01/09/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 3.00m BGL.
01/09/2023	3.00				1.00 - 2.00	87	100	No	
					2.00 - 3.00	77	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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Tel: 0191 387 4700
 Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-04	
Client: Hall Construction Services Ltd	Location: E:435553.281 N:431048.945		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m): 24.852	Start Date: 31/08/2023	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1					(1.50)	MADE GROUND: Firm to stiff brownish grey to grey slightly sandy slightly gravelly clay with some rootlets. Gravel is fine to coarse angular to rounded and includes sandstone, mudstone and brick). at c.0.00-0.70m BGL ... with occasional coal.	
1.00-2.00	L2			23.35		1.50	MADE GROUND (Grey boulders with a little gravel. Gravel is coarse angular and includes sandstone. Boulders are grey weak to medium strong mudstone).	
2.00-3.00	L3					(1.50)		
3.00-4.00	L4			21.85		3.00	MADE GROUND (Grey boulders with a little gravel. Gravel is fine to medium angular to subangular and includes sandstone. Boulders are extremely weak to weak grey mudstone).	
4.00-5.00	L5			21.05		(0.80)		
				20.85		4.00	MADE GROUND (Light brown boulder. Boulder is extremely weak to weak light brown mudstone with a little coal and clay).	
				19.85		(1.00)	MADE GROUND (Grey boulder. Boulder is extremely weak to weak grey mudstone).	
						5.00	Complete at 5.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
31/08/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 5.00m BGL.
31/08/2023	5.00				1.00 - 2.00	101	100	No	
					2.00 - 3.00	87	100	No	
					3.00 - 4.00	77	100	No	
					4.00 - 5.00	67	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
Regional Office: 145 South Road, Wignall's Barn, Bretherton, Leyland, PR26 9AJ

Tel: 0191 387 4700
Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-05	
Client: Hall Construction Services Ltd		Location: E:435658.191 N:431033.641	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 24.479	Start Date: 31/08/2023
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1					(1.00)	MADE GROUND (Firm to stiff brownish grey to light grey slightly gravelly silty clay with some rootlets. Gravel is fine to coarse angular to rounded and includes sandstone, brick and flint).	
1.00-2.00	L2			23.48		1.00	at c.0.70-0.80m BGL ... with occasional lustrous coal.	
2.00-3.00	L3					(2.00)	MADE GROUND (Stiff grey slightly gravelly silty clay. Gravel is fine to medium angular to rounded and includes sandstone, brick, mudstone, flint and lustrous coal).	
				21.48		3.00	Complete at 3.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
31/08/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 3.00m BGL.
31/08/2023	3.00				1.00 - 2.00	87	100	No	
					2.00 - 3.00	87	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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Tel: 0191 387 4700
 Tel: 01772 735 300

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
PRELIM1

Project: Skelton Lake		Exploratory Hole No. MW2A-06	
Client: Hall Construction Services Ltd		Location: E:435702.969 N:431109.275	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 28.721	Start Date: 31/08/2023
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-1.00	L1			28.32		0.40	MADE GROUND (Firm brownish grey slightly sandy gravelly clay with occasional rootlets. Gravel is fine to coarse angular to rounded and includes sandstone and bricks).	
1.00-2.00	L2					(2.60)	MADE GROUND (Stiff grey slightly sandy very gravelly clay. Gravel is fine to coarse angular to rounded and includes sandstone, mudstone and brick).	
2.00-3.00	L3							
3.00-4.00	L4			25.72		3.00	MADE GROUND (Light brown silty gravelly sand. Sand is fine to medium. Gravel is angular and includes brick).	
				25.42		3.30	MADE GROUND (Stiff grey slightly sandy very gravelly clay. Gravel is fine to coarse angular to rounded and includes sandstone, brick, mudstone and lustrous coal).	
4.00-5.00	L5					(1.70)		
				23.72		5.00	Complete at 5.00m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
31/08/2023	0.00				0.00 - 1.00	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 1.00m and 5.00m BGL.
31/08/2023	5.00				1.00 - 2.00	101	100	No	
					2.00 - 3.00	87	100	No	
					3.00 - 4.00	77	100	No	
					4.00 - 5.00	67	100	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: A.G	Logged by: P. Ameh	Contract No. 4468
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Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix C

Periodic monitoring records



IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is marked by a red wooden post and is surrounded by yellow flowers and vegetation

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	13:00
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-01
Groundwater Level (mbgl)	Dry
Depth to base (mbgl)	3.05
What 3 Words	stem.flown.energetic

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	0.1	0.1	21.8	78.0	<1	<1
Initial	0.1	0.3	9.5	3.8	86.4	2	<1
30	0.1	0.3	9.7	2.2	87.8	1	<1
60	0.1	0.3	9.7	2.1	87.9	1	<1
120		0.3	9.7	2.0	88.0	2	<1
180		0.3	9.9	1.6	88.2	2	<1
240		0.3	10.0	1.2	88.5	1	<1
300		0.3	10.6	0.7	88.4	1	<1
360		0.3	10.8	0.4	88.5	1	<1
420		0.3	11.0	0.2	88.5	1	<1
480		0.3	11.1	0.1	88.5	<1	<1
540		0.3	11.2	0.1	88.4	<1	<1
600		0.3	11.2	0.1	88.4	<1	<1
Fresh Air	N/A	0.1	0.1	20.1	79.7	<1	<1

BOREHOLE DETAILS		STEADY STATE FINAL RESULTS					
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	540	480	540	480	30
Steady state value	0.1	0.3	11.2	0.1	88.4	<1	<1
Peak Value (O ₂ Low)	0.1	0.3	11.2	0.1	88.5	2	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is marked by a red wooden post and is adjacent to heap of brown gravelly material

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	12:20
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-02
Groundwater Level (mbgl)	4.05
Depth to base (mbgl)	4.95
What 3 Words	wipe.call.vanish

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	21.7	78.2	<1	<1
Initial	<0.1	<0.1	0.1	21.4	78.5	7	<1
30	<0.1	<0.1	4.5	6.3	89.2	1	<1
60	<0.1	<0.1	4.5	0.6	94.9	<1	<1
120		<0.1	4.5	0.5	95.0	<1	<1
180		<0.1	4.5	0.4	95.1	<1	<1
240		<0.1	4.5	0.3	95.2	<1	<1
300		<0.1	4.5	0.3	95.2	<1	<1
360							
420							
480							
540							
600							
Fresh Air	N/A	0.1	0.1	20.1	79.7	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	30	240	240	60	30
Steady state value	<0.1	<0.1	4.5	0.3	95.2	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	4.5	0.3	95.2	7	<1

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IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is marked by a red wooden post and is nearby large concrete blocks

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	12:10
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-03
Groundwater Level (mbgl)	0.96
Depth to base (mbgl)	3.04
What 3 Words	jukebox.less.whips

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	21.7	78.2	<1	<1
Initial	-7.0	0.1	9.5	3.8	86.6	2	<1
30	-3.0	0.1	9.7	2.2	88.0	1	<1
60	-1.2	0.1	9.7	2.1	88.1	1	<1
120	<0.1	<0.1	9.7	2.0	88.3	2	<1
180	<0.1	Pump stopped after 120 seconds. Removed sample line from tap and hissing/suction sound was heard - due to insufficient gas in monitoring well to sample					
240							
300							
360							
420							
480							
540		0.1	0.1	20.5	79.3	<1	<1
600							
Fresh Air	N/A	0.1	0.1	20.5	79.3	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	120	30	480	540	120	30
Steady state value	<0.1	<1	9.7	0.1	88.4	2	<1
Peak Value (O ₂ Low)	<0.1	0.1	9.7	2.0	88.3	2	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is marked by a red wooden post

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	12:05
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-04
Groundwater Level (mbgl)	4.23
Depth to base (mbgl)	5.06
What 3 Words	method. towers.risky

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	0.1	0.1	21.8	78.0	<1	<1
Initial	<0.1	0.2	8.1	21.4	70.3	<1	<1
30	0.1	0.2	8.3	5.2	86.3	<1	<1
60	0.1	0.2	8.3	1.8	89.7	<1	<1
120		0.2	8.3	1.7	89.8	<1	<1
180		0.2	8.3	1.5	90.0	1	<1
240		0.2	8.3	1.5	90.0	1	<1
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	0.1	0.1	20.1	79.7	<1	<1

BOREHOLE DETAILS		STEADY STATE FINAL RESULTS					
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	540	480	540	480	30
Steady state value	0.1	0.3	11.2	0.1	88.4	<1	<1
Peak Value (O ₂ Low)	0.1	0.2	8.3	1.5	90.0	1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is located adjacent to a gravel heap

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	11:45
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-05
Groundwater Level (mbgl)	Dry
Depth to base (mbgl)	3.00
What 3 Words	weds.maple.limp

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	0.1	0.1	21.2	78.6	<1	<1
Initial	<0.1	0.1	8.3	11.0	80.6	2	<1
30	<0.1	0.1	8.5	9.8	81.6	1	<1
60	<0.1	0.1	8.5	9.7	81.7	1	<1
120		0.1	8.6	9.5	81.8	2	<1
180		0.1	8.7	9.4	81.8	1	<1
240		0.1	9.1	8.9	81.9	1	<1
300		0.1	9.4	8.4	82.1	<1	<1
360		0.1	9.0	8.9	82.0	<1	<1
420		0.1	8.3	10.0	81.6	<1	<1
480							
540							
600							
Fresh Air	N/A	0.1	0.1	20.1	79.7	<1	<1

BOREHOLE DETAILS		STEADY STATE FINAL RESULTS					
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	420	420	540	300	30
Steady state value	<0.1	0.1	8.3	10.0	81.6	<1	<1
Peak Value (O ₂ Low)	<0.1	0.1	9.4	8.4	82.1	2	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated

Extra Notes:
Monitoring well is marked by a red wooden post and located nearby large concrete blocks

PROJECT DETAILS			
Project ID	GG53070	Date	18/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	11:30
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	996
Atmospheric Pressure - GFM	996

BOREHOLE DETAILS	
Borehole ID	MW2A-06
Groundwater Level (mbgl)	2.90
Depth to base (mbgl)	5.00
What 3 Words	jabs.strike.label

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	21.1	78.8	<1	<1
Initial	0.1	0.2	9.0	14.1	76.7	3	<1
30	0.1	0.2	9.0	4.0	86.8	1	<1
60	<0.1	0.2	9.0	3.9	86.9	1	<1
120		0.2	9.2	3.7	86.9	1	<1
180		0.2	9.3	3.4	87.1	1	<1
240		0.2	9.6	3.0	87.2	1	<1
300		0.2	9.5	3.3	87.0	<1	<1
360		0.2	8.6	5.2	86.0	1	<1
420		0.2	8.3	6.1	85.4	<1	<1
480							
540							
600							
Fresh Air	N/A	0.1	0.1	20.1	79.7	<1	<1

BOREHOLE DETAILS		STEADY STATE FINAL RESULTS					
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	60	30	420	420	420	420	30
Steady state value	<0.1	0.1	8.3	6.1	85.4	<1	<1
Peak Value (O ₂ Low)	0.1	0.2	9.6	3.0	87.2	3	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph. Dark
Brown mud at the base of the standpipe.

PROJECT DETAILS			
Project ID	GG3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	08:46
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1012

BOREHOLE DETAILS	
Borehole ID	MW2A-01
Groundwater Level (mbgl)	Dry
Depth to base (mbgl)	3.05
What 3 Words	stem.flow.n.energetic

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	<0.1	20.5	79.5	<1	<1
Initial	<0.1	<0.1	3.2	13.0	83.8	3	<1
30	<0.1	<0.1	4.4	5.4	90.2	<1	<1
60		<0.1	4.5	5.2	90.3	<1	<1
120		<0.1	4.5	5.5	90.0	<1	<1
180		<0.1	4.4	6.6	89.0	<1	<1
240		<0.1	4.4	7.8	87.8	<1	<1
300		<0.1	4.2	9.4	86.4	<1	<1
360		<0.1	3.7	13.4	82.9	<1	<1
420		<0.1	3.4	15.0	81.6	<1	<1
480		<0.1	3.2	16.3	80.5	<1	<1
540		<0.1	2.9	17.2	79.9	<1	<1
600		<0.1	2.7	17.7	79.6	<1	<1
Fresh Air	N/A	<0.1	0.1	20.5	79.4	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	600	600	600	30	30
Steady state value	<0.1	-0.1	2.7	17.7	79.6	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	4.5	5.2	90.3	3	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph.

PROJECT DETAILS			
Project ID	GG3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	09:03
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1012

BOREHOLE DETAILS	
Borehole ID	MW2A-02
Groundwater Level (mbgl)	4.15
Depth to base (mbgl)	4.90
What 3 Words	wipe.call.vanish

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.0	20.5	79.5	<1	<1
Initial	<0.1	<0.1	4.0	1.1	94.9	<1	<1
30	<0.1	<0.1	4.1	1.2	94.7	<1	<1
60		<0.1	4.1	1.1	94.8	<1	<1
120		<0.1	4.1	0.9	95.0	<1	<1
180		<0.1	4.2	0.7	95.1	<1	<1
240		<0.1	4.2	0.5	95.3	<1	<1
300		<0.1	4.2	0.3	95.5	<1	<1
360		<0.1	4.2	0.1	95.7	<1	<1
420		<0.1	4.2	<0.1	95.8	<1	<1
480							
540							
600							
Fresh Air	N/A	<0.1	<0.1	20.2	79.8	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	180	420	240	30	30
Steady state value	<0.1	<0.1	4.2	<0.1	95.2	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	4.2	<0.1	95.8	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph.

PROJECT DETAILS			
Project ID	GGS3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	09:16
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1013

BOREHOLE DETAILS	
Borehole ID	MW2A-03
Groundwater Level (mbgl)	1.24
Depth to base (mbgl)	3.09
What 3 Words	jukebox.less.whips

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	<0.1	20.6	79.4	<1	<1
Initial	<0.1	<0.1	1.8	19.4	78.8	<1	<1
30	<0.1	<0.1	<0.1	20.4	79.6	<1	<1
60		<0.1	<0.1	20.6	79.4	<1	<1
120							
180							
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	<0.1	20.2	79.8	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	30	60	240	30	30
Steady state value	<0.1	<0.1	<0.1	20.6	95.2	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	1.8	19.4	79.6	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph.

PROJECT DETAILS			
Project ID	GGS3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	09:37
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1013

BOREHOLE DETAILS	
Borehole ID	MW2A-04
Groundwater Level (mbgl)	3.79
Depth to base (mbgl)	6.08
What 3 Words	method.towers.risky

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	<0.1	20.5	79.5	<1	<1
Initial	<0.1	<0.1	7.4	8.9	83.7	<1	<1
30	<0.1	<0.1	7.9	7.7	84.4	<1	<1
60		<0.1	7.8	7.8	84.4	<1	<1
120		<0.1	7.8	7.7	84.5	<1	<1
180		<0.1	8.0	7.8	84.2	<1	<1
240		<0.1	8.0	8.0	84.0	<1	<1
300		<0.1	8.1	8.6	83.3	<1	<1
360		<0.1	8.1	9.1	82.8	<1	<1
420		<0.1	8.2	9.5	82.3	<1	<1
480		<0.1	8.2	10.0	81.8	<1	<1
540		<0.1	8.2	10.4	81.4	<1	<1
600		<0.1	8.1	10.8	81.1	<1	<1
Fresh Air	N/A	<0.1	<0.1	20.5	79.5	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	600	600	240	30	30
Steady state value	<0.1	<0.1	8.1	10.8	95.2	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	8.2	7.7	84.5	<1	<1

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Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph. The valve was open on arrival. Plant (large excavation) in operation moving in near proximity.

PROJECT DETAILS			
Project ID	GG3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	09:38
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1011

BOREHOLE DETAILS	
Borehole ID	MW2A-05
Groundwater Level (mbgl)	Dry
Depth to base (mbgl)	3.10
What 3 Words	weds.maple.limp

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	<0.1	20.5	79.5	<1	<1
Initial	0.3	<0.1	4.3	15.6	80.1	<1	<1
30	0.3	<0.1	4.3	15.5	80.2	<1	<1
60	0.3	<0.1	4.3	15.4	80.3	<1	<1
120	0.3	<0.1	5.0	15.3	79.7	<1	<1
180		<0.1	5.2	15.1	79.7	<1	<1
240		<0.1	5.4	14.7	79.9	<1	<1
300		<0.1	5.7	14.4	79.9	<1	<1
360		<0.1	5.7	14.2	80.1	<1	<1
420		<0.1	5.3	14.3	80.4	<1	<1
480		<0.1	4.9	15.0	80.1	<1	<1
540		<0.1	4.5	15.7	79.8	<1	<1
600		<0.1	4.2	15.2	80.6	<1	<1
Fresh Air	N/A	<0.1	<0.1	20.6	79.4	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	600	600	240	30	30
Steady state value	0.3	0.1	4.2	15.2	95.2	<1	<1
Peak Value (O ₂ Low)	0.3	0.1	5.7	14.2	80.6	<1	<1

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Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

No headworks installed, standpipe exposed above ground
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Rising pressure trend. Warm, sunny, light breeze. Max temperature 18°C.
Wind direction SW, max wind speed 17 mph with gusts up to 28 mph.

PROJECT DETAILS			
Project ID	GGS3070	Date	25/09/2023
Site	Skelton Grange, Leeds, Phase 2	Time	10:01
Specialist	PG		

EQUIPMENT	
Model	Serial Number
GFM435	11028
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1014
Atmospheric Pressure - GFM	1007

BOREHOLE DETAILS	
Borehole ID	MW2A-06
Groundwater Level (mbgl)	2.56
Depth to base (mbgl)	5.01
What 3 Words	jabs.strike.label

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.0	20.5	79.5	<1	<1
Initial	<0.1	<0.1	0.7	20.1	79.2	<1	<1
30	<0.1	<0.1	0.7	20.1	79.2	<1	<1
60	<0.1	<0.1	0.7	20.1	79.2	<1	<1
120		<0.1	0.7	20.1	79.2	<1	<1
180							
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	0.0	0.0	20.7	79.3	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	30	30	240	30	30
Steady state value	<0.1	<0.1	0.7	20.1	95.2	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	0.7	20.1	79.2	<1	<1

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Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

Headworks are raised
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Well disturbed approximately 1 hour before periodic monitoring due to instrument collection
Hydrogen was present during the periodic monitoring of MW21-01 at a concentration of 2ppm

PROJECT DETAILS			
Project ID	GG3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:18
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1021

BOREHOLE DETAILS	
Borehole ID	MW2A-01
Groundwater Level (mbgl)	Dry
Depth to base (mbgl)	3.02
What 3 Words	stem.flow.n.energetic

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	20.7	79.2	<1	<1
Initial	<0.1	<0.1	3.5	20.0	76.5	<1	<1
30	<0.1	<0.1	3.6	13.3	83.1	2	<1
60	<0.1	<0.1	3.9	12.3	83.8	<1	<1
120		<0.1	4.0	12.0	84.0	<1	<1
180		<0.1	5.1	10.0	84.9	<1	<1
240		<0.1	7.9	3.8	88.3	<1	<1
300		<0.1	8.5	1.9	89.6	<1	<1
360		<0.1	8.8	1.2	90.0	<1	<1
420		<0.1	8.9	1.1	90.0	<1	<1
480		<0.1	8.9	1.1	90.0	<1	<1
540		<0.1	8.9	1.5	89.6	<1	<1
600		<0.1	8.8	1.9	89.3	<1	<1
Fresh Air	N/A	<0.1	0.1	20.3	79.6	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	600	600	600	60	30
Steady state value	<0.1	<0.1	8.8	1.9	89.3	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	8.9	1.1	90.0	2	<1

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Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

Headworks are raised
Valve in rubber bung is clear and clean
Area surrounding borehole is saturated
Clayey, muddy ground surrounding monitoring well with puddles of rainwater in surrounding area

Extra Notes:
Well disturbed approximately 1 hour before periodic monitoring due to instrument collection
Hydrogen increased to a maximum concentration of 3ppm during the periodic monitoring

PROJECT DETAILS			
Project ID	GG3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:05
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1021

BOREHOLE DETAILS	
Borehole ID	MW2A-02
Groundwater Level (mbgl)	4.35
Depth to base (mbgl)	4.86
What 3 Words	wipe.call.vanish

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	0.1	0.1	21.3	78.5	<1	<1
Initial	<0.1	0.3	4.8	7.3	87.6	<1	<1
30	<0.1	0.3	4.8	0.6	94.3	<1	<1
60	<0.1	0.3	4.8	0.3	94.6	<1	<1
120		0.3	4.8	0.2	94.7	<1	<1
180		0.3	4.8	0.2	94.7	<1	<1
240		0.3	4.8	0.2	94.7	<1	<1
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	0.1	20.2	79.7	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	30	120	120	30	30
Steady state value	<0.1	0.3	4.8	0.2	94.7	<1	<1
Peak Value (O ₂ Low)	<0.1	0.3	4.8	0.2	94.7	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

Headworks are raised
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Well disturbed approximately 1 hour before periodic monitoring due to instrument collection

PROJECT DETAILS			
Project ID	GG3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:35
Specialist	EC		

EQUIPMENT	
Model	Serial Number
GA5000	G503519
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1021

BOREHOLE DETAILS	
Borehole ID	MW2A-03
Groundwater Level (mbgl)	1.55
Depth to base (mbgl)	3.07
What 3 Words	jukebox.less.whips

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	20.4	79.5	<1	<1
Initial	<0.1	<0.1	7.4	17.5	75.1	2	<1
30	<0.1	<0.1	7.5	11.5	81.0	<1	<1
60	<0.1	<0.1	7.3	11.6	81.1	<1	<1
120		Pump on GA5000 stopped due to insufficient air to sample in standpipe - hissing/suction sound when tubing was released from tap					
180							
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	0.1	20.6	79.3	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	N/A	N/A	N/A	N/A	N/A
Steady state value	<0.1	<0.1	N/A	N/A	N/A	N/A	N/A
Peak Value (O ₂ Low)	<0.1	<0.1	7.5	11.5	81.1	2	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

Headworks are raised
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Well disturbed approximately 1 hour before periodic monitoring due to instrument collection

PROJECT DETAILS			
Project ID	GGS3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:34
Specialist	MR		

EQUIPMENT	
Model	Serial Number
GFM435	10356
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1017

BOREHOLE DETAILS	
Borehole ID	MW2A-04
Groundwater Level (mbgl)	3.81
Depth to base (mbgl)	5.07
What 3 Words	method.towers.risky

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	20.3	79.6	<1	<1
Initial	<0.1	<0.1	0.2	20.2	79.6	<1	<1
30	<0.1	<0.1	0.1	18.8	81.1	<1	<1
60	<0.1	<0.1	1.0	18.7	80.3	<1	<1
120		<0.1	1.1	18.5	80.4	<1	<1
180		<0.1	1.2	18.4	80.4	<1	<1
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	0.1	20.5	79.4	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	180	180	120	30	30
Steady state value	<0.1	<.1	1.2	18.4	80.4	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	1.2	18.4	81.1	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS							
Headworks are raised Valve in rubber bung is clear and clean Area surrounding borehole is damp				Extra Notes: Well disturbed approximately 1 hour before periodic monitoring due to instrument collection			

PROJECT DETAILS			
Project ID	GGS3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:20
Specialist	MR		

EQUIPMENT	
Model	Serial Number
GFM435	10356
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1018

BOREHOLE DETAILS	
Borehole ID	MW2A-05
Groundwater Level (mbgl)	2.86
Depth to base (mbgl)	3.07
What 3 Words	weds.maple.limp

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	20.3	79.6	<1	<1
Initial	2.4	<0.1	0.3	19.8	79.9	<1	<1
30	<0.1	<0.1	1.9	17.5	80.6	<1	<1
60	<0.1	<0.1	2.1	17.0	80.9	<1	<1
120	<0.1	<0.1	1.8	17.5	80.7	<1	<1
180	<0.1	<0.1	1.7	17.9	80.4	<1	<1
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	0.1	20.6	79.3	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	180	180	180	30	30
Steady state value	<0.1	<0.1	1.7	17.9	80.4	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	2.1	17.0	80.9	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement



Experts in Continuous Monitoring

IMS Ref: GMPM
Version: 2.3

MONITORING WELL COMMENTS

Headworks are raised
Valve in rubber bung is clear and clean
Area surrounding borehole is damp

Extra Notes:
Well disturbed approximately 1 hour before periodic monitoring due to instrument collection

PROJECT DETAILS			
Project ID	GGS3070	Date	16/10/2023
Site	Skelton Grange, Leeds, Phase 2	Time	14:06
Specialist	MR		

EQUIPMENT	
Model	Serial Number
GFM435	10356
Dip tape	N/A

PRESSURE DETAILS	Millibars
Atmospheric Pressure - Met Office	1022
Atmospheric Pressure - GFM	1018

BOREHOLE DETAILS	
Borehole ID	MW2A-06
Groundwater Level (mbgl)	2.04
Depth to base (mbgl)	4.99
What 3 Words	jabs.strike.label

TIME (seconds)	Gas Flow Litres/hour	Gas Readings					
		CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Fresh Air	N/A	<0.1	0.1	20.2	79.7	<1	<1
Initial	<0.1	<0.1	2.3	17.4	80.3	<1	<1
30	<0.1	<0.1	5.6	13.5	80.9	<1	<1
60	<0.1	<0.1	5.6	13.4	81.0	<1	<1
120		<0.1	5.7	13.3	81.0	<1	<1
180		<0.1	5.7	13.3	81.0	<1	<1
240							
300							
360							
420							
480							
540							
600							
Fresh Air	N/A	<0.1	0.1	20.7	79.2	<1	<1

STEADY STATE FINAL RESULTS							
	Flow (l/hr)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	BAL	CO (ppmv)	H ₂ S (ppmv)
Steady state time (s)	30	30	120	120	60	30	30
Steady state value	<0.1	<0.1	5.7	13.3	81.0	<1	<1
Peak Value (O ₂ Low)	<0.1	<0.1	5.7	13.3	81.0	<1	<1

KEY: <0.1= Below instrument limit of detection, NM = Not Measured, N/A = Not Applicable, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, ltr/hr = litres per hour, mbgl = metres below ground level, OS = off scale of instrument, Met Office AP is relative to sea level, GFM AP is site specific measurement

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix D

Continuous monitoring data

Time Series Data

Project Ref:	GG53070
Project Name:	Skelton Grange, Phase 2
Borehole ref:	MW2A-01
Instrument Name and ID:	GC26/0914 FD05
Start Date:	25/09/2023 11:35
End Date:	16/10/2023 12:35
Days of monitoring:	21
Monitoring Frequency (mins):	60
Total samples taken:	506



Summary Table

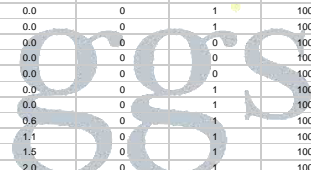
	CH ₄	CO ₂	O ₂	CO	H ₂ S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Flow	Temperature
Minimum	0.0	0.7	0.0	0	0	991	-1.40	-1.51	8.4
Maximum	0.0	15.1	18.3	10	1	1022	1.02	2.14	18.2
Range	0.0	14.4	18.3	10	1	32	2.41	3.65	9.8

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
25/09/2023 11:35	0.0	0.7	18.3		0	1010	N/A	-0.32	18.2
25/09/2023 12:36	0.0	1.4	17.4		0	1011	N/A	-0.38	17.8
25/09/2023 13:35	0.0	1.7	16.8		0	1012	N/A	-0.38	17.6
25/09/2023 14:35	0.0	2.0	16.4		0	1012	N/A	-0.30	17.6
25/09/2023 15:35	0.0	2.4	16.1	0	0	1012	N/A	-0.35	17.7
25/09/2023 16:35	0.0	2.5	15.9	0	0	1012	N/A	-0.30	17.8
25/09/2023 17:36	0.0	2.7	15.8	0	0	1012	N/A	-0.24	17.8
25/09/2023 18:35	0.0	2.9	15.7	0	0	1013	N/A	-0.30	17.6
25/09/2023 19:35	0.0	2.9	15.7	0	0	1013	0.35	-0.30	17.5
25/09/2023 20:35	0.0	2.9	15.7	0	0	1013	0.18	-0.30	17.3
25/09/2023 21:35	0.0	3.0	15.6	0	0	1014	0.21	-0.24	17.0
25/09/2023 22:35	0.0	3.2	15.6	0	0	1014	0.17	-0.24	16.8
25/09/2023 23:35	0.0	3.2	15.6	0	0	1013	0.11	0.00	16.5
26/09/2023 00:35	0.0	3.4	15.5	0	0	1013	0.08	0.00	16.3
26/09/2023 01:35	0.0	3.6	15.4	0	0	1013	-0.01	0.00	16.0
26/09/2023 02:35	0.0	3.6	15.2	0	0	1013	-0.08	0.00	15.7
26/09/2023 03:35	0.0	3.7	15.1	0	0	1012	-0.19	0.00	15.4
26/09/2023 04:35	0.0	3.9	14.8	0	0	1012	-0.24	0.00	15.3
26/09/2023 05:35	0.0	4.1	14.4	0	0	1011	-0.33	0.18	15.1
26/09/2023 06:35	0.0	4.2	13.4	0	0	1010	-0.38	0.00	14.9
26/09/2023 07:35	0.0	4.7	11.2	0	0	1010	-0.38	0.18	14.7
26/09/2023 08:35	0.0	5.1	9.0	0	0	1010	-0.34	0.18	14.6
26/09/2023 09:35	0.0	5.4	7.2	0	0	1010	-0.31	0.00	14.5
26/09/2023 10:35	0.0	5.7	5.7	0	0	1009	-0.32	0.00	14.4
26/09/2023 11:35	0.0	6.0	4.3	0	0	1009	-0.35	0.30	14.4
26/09/2023 12:35	0.0	6.4	3.2	0	1	1008	-0.30	0.27	14.5
26/09/2023 13:35	0.0	6.9	2.4	0	1	1008	-0.28	0.27	14.8
26/09/2023 14:35	0.0	7.0	1.8	2	1	1007	-0.39	0.27	15.1
26/09/2023 15:35	0.0	7.6	1.3	2	1	1007	-0.32	0.21	15.6
26/09/2023 16:35	0.0	7.9	0.9	2	1	1008	-0.31	0.00	15.9
26/09/2023 17:35	0.0	8.1	0.7	2	1	1008	-0.13	0.00	16.2
26/09/2023 18:35	0.0	8.2	0.6	1	1	1009	-0.01	0.00	16.3
26/09/2023 19:35	0.0	8.4	0.5	0	1	1009	0.09	0.00	16.3
26/09/2023 20:35	0.0	8.4	1.1	0	1	1010	0.22	0.00	16.1
26/09/2023 21:35	0.0	8.3	2.5	0	1	1010	0.33	-0.24	15.9
26/09/2023 22:35	0.0	7.7	4.2	0	0	1010	0.38	0.00	15.7
26/09/2023 23:35	0.0	7.2	5.6	0	0	1011	0.39	-0.18	15.5
27/09/2023 00:35	0.0	6.7	6.8	0	0	1011	0.36	-0.18	15.3
27/09/2023 01:35	0.0	6.2	8.0	0	1	1012	0.41	-0.24	15.1
27/09/2023 02:35	0.0	5.7	8.7	0	0	1012	0.35	-0.18	14.8
27/09/2023 03:35	0.0	5.4	9.3	0	0	1012	0.28	0.00	14.6
27/09/2023 04:35	0.0	5.2	9.8	0	0	1012	0.25	0.00	14.5
27/09/2023 05:35	0.0	5.1	10.1	0	1	1011	0.11	0.00	14.3
27/09/2023 06:35	0.0	5.1	10.3	0	1	1011	0.09	0.00	14.2
27/09/2023 07:35	0.0	5.1	10.5	0	1	1011	0.04	0.00	14.1
27/09/2023 08:35	0.0	5.1	10.6	0	1	1011	-0.15	0.00	14.0
27/09/2023 09:35	0.0	5.1	10.5	0	1	1012	-0.02	0.00	13.9
27/09/2023 10:35	0.0	5.2	10.4	0	1	1011	-0.08	0.00	14.0
27/09/2023 11:35	0.0	5.4	10.2	0	1	1010	-0.16	0.00	14.1
27/09/2023 12:35	0.0	5.5	9.2	0	1	1009	-0.30	0.21	14.4
27/09/2023 13:35	0.0	6.2	6.7	0	1	1008	-0.46	0.27	14.6
27/09/2023 14:35	0.0	7.0	4.3	2	1	1006	-0.68	0.43	14.8
27/09/2023 15:35	0.0	7.9	2.7	3	1	1005	-0.73	0.38	14.9
27/09/2023 16:35	0.0	8.7	1.6	5	1	1003	-1.11	0.64	15.1
27/09/2023 17:35	0.0	9.6	0.8	4	1	1001	-1.33	0.64	15.2
27/09/2023 18:35	0.0	10.1	0.2	5	1	999	-1.40	0.59	15.3
27/09/2023 19:35	0.0	10.7	0.0	4	1	998	-1.36	0.67	15.4
27/09/2023 20:35	0.0	11.4	0.0	4	1	997	-1.32	0.56	15.5
27/09/2023 21:35	0.0	11.5	0.0	4	1	996	-1.17	0.59	15.6
27/09/2023 22:35	0.0	11.9	0.0	3	1	996	-1.10	0.46	15.6
27/09/2023 23:35	0.0	12.2	0.0	3	1	997	-0.81	0.35	15.6
28/09/2023 00:35	0.0	12.2	0.0	3	1	997	-0.47	0.35	15.6
28/09/2023 01:35	0.0	12.4	0.0	3	1	997	-0.25	0.30	15.5
28/09/2023 02:35	0.0	12.6	0.0	2	1	999	0.08	0.00	15.4
28/09/2023 03:35	0.0	12.6	0.0	3	1	999	0.27	0.00	15.4
28/09/2023 04:35	0.0	12.6	0.0	3	1	1000	0.49	0.00	15.3
28/09/2023 05:35	0.0	12.2	0.0	2	1	1001	0.68	0.00	15.3
28/09/2023 06:35	0.0	9.9	2.9	0	1	1003	0.74	-0.18	15.3
28/09/2023 07:35	0.0	8.4	4.5	0	1	1003	0.81	-0.24	15.2
28/09/2023 08:35	0.0	7.6	5.2	0	1	1004	0.85	-0.24	15.1
28/09/2023 09:35	0.0	7.2	5.8	0	1	1005	0.82	-0.32	15.1
28/09/2023 10:35	0.0	6.7	6.2	1	1	1006	0.83	-0.32	15.1
28/09/2023 11:35	0.0	6.5	6.7	1	1	1006	0.70	-0.32	15.1
28/09/2023 12:35	0.0	6.2	7.2	1	1	1006	0.62	-0.24	15.1
28/09/2023 13:35	0.0	6.0	7.7	1	1	1006	0.49	-0.24	15.2
28/09/2023 14:35	0.0	5.9	8.2	2	1	1006	0.39	-0.18	15.3
28/09/2023 15:35	0.0	5.7	8.7	1	1	1006	0.29	0.00	15.5
28/09/2023 16:35	0.0	5.5	9.1	1	1	1006	0.10	-0.18	15.6
28/09/2023 17:35	0.0	5.5	9.4	3	1	1005	-0.11	0.00	15.7
28/09/2023 18:35	0.0	5.7	9.5	2	1	1005	-0.17	0.00	15.7
28/09/2023 19:35	0.0	5.7	9.5	2	1	1005	-0.24	0.00	15.6
28/09/2023 20:35	0.0	5.9	9.5	2	1	1004	-0.28	0.00	15.5
28/09/2023 21:35	0.0	5.9	9.3	2	1	1004	-0.27	0.00	15.4
28/09/2023 22:35	0.0	6.2	9.1	3	1	1004	-0.32	0.00	15.3
28/09/2023 23:35	0.0	6.4	8.4	3	1	1003	-0.32	0.00	15.3
29/09/2023 00:35	0.0	6.7	7.1	3	1	1003	-0.22	0.00	15.2
29/09/2023 01:35	0.0	7.0	5.7	3	1	1003	-0.15	0.00	15.1
29/09/2023 02:35	0.0	7.4	4.5	3	1	1004	-0.11	0.00	15.1
29/09/2023 03:35	0.0	7.6	3.6	3	1	1004	-0.04	0.00	15.0
29/09/2023 04:35	0.0	7.9	3.1	2	1	1005	0.06	0.00	14.9
29/09/2023 05:35	0.0	7.9	3.9	2	1	1005	0.18	0.00	14.9
29/09/2023 06:35	0.0	7.6	5.9	1	1	1006	0.33	-0.18	14.8
29/09/2023 07:35	0.0	6.4	8.8	1	1	1007	0.47	-0.24	14.6
29/09/2023 08:35	0.0	5.7	10.4	1	1	1008	0.61	-0.27	14.4

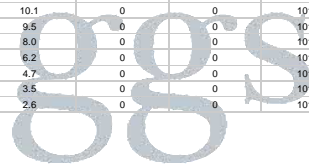
Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
29/09/2023 09:35	0.0	5.2	11.0	1	1	1010	0.78	-0.32	14.4
29/09/2023 10:35	0.0	4.9	11.5	1	1	1011	0.84	-0.27	14.4
29/09/2023 11:35	0.0	4.7	11.9	2	1	1011	0.81	-0.32	14.5
29/09/2023 12:35	0.0	4.6	12.3	2	1	1012	0.85	-0.32	14.7
29/09/2023 13:35	0.0	4.4	12.7	2	1	1013	0.85	-0.38	14.9
29/09/2023 14:35	0.0	4.2	13.1	2	1	1013	0.81	-0.30	15.2
29/09/2023 15:35	0.0	4.1	13.4	2	1	1014	0.69	-0.35	15.5
29/09/2023 16:35	0.0	3.9	13.8	3	1	1014	0.57	-0.32	15.8
29/09/2023 17:35	0.0	3.7	14.2	3	1	1015	0.53	-0.30	16.0
29/09/2023 18:35	0.0	3.7	14.5	3	1	1016	0.56	-0.38	16.0
29/09/2023 19:35	0.0	3.6	14.8	3	1	1016	0.51	-0.38	15.9
29/09/2023 20:35	0.0	3.6	15.0	3	1	1017	0.49	-0.32	15.7
29/09/2023 21:35	0.0	3.6	15.2	2	1	1017	0.48	-0.32	15.5
29/09/2023 22:35	0.0	3.4	15.4	3	1	1018	0.46	-0.32	15.3
29/09/2023 23:35	0.0	3.4	15.6	2	1	1018	0.40	-0.32	15.1
30/09/2023 00:35	0.0	3.4	15.7	2	1	1019	0.46	-0.27	14.8
30/09/2023 01:35	0.0	3.2	15.8	2	1	1018	0.33	-0.24	14.6
30/09/2023 02:35	0.0	3.2	15.9	2	1	1019	0.29	-0.24	14.4
30/09/2023 03:35	0.0	3.2	16.0	2	1	1018	0.18	-0.24	14.3
30/09/2023 04:35	0.0	3.2	16.1	2	3.2	1018	0.13	-0.18	14.2
30/09/2023 05:35	0.0	3.2	16.1	1	1	1018	0.13	-0.18	14.1
30/09/2023 06:35	0.0	3.2	16.2	1	1	1019	0.11	0.00	13.9
30/09/2023 07:35	0.0	3.2	16.2	0	1	1019	0.05	0.00	13.7
30/09/2023 08:35	0.0	3.2	16.3	1	1	1020	0.16	-0.18	13.5
30/09/2023 09:35	0.0	3.2	16.3	1	1	1020	0.20	-0.18	13.4
30/09/2023 10:35	0.0	3.2	16.3	1	1	1020	0.19	0.00	13.4
30/09/2023 11:35	0.0	3.2	16.3	1	1	1020	0.19	0.00	13.6
30/09/2023 12:35	0.0	3.2	16.3	1	1	1019	0.08	0.00	13.8
30/09/2023 13:35	0.0	3.2	16.2	2	1	1018	-0.02	0.00	14.1
30/09/2023 14:35	0.0	3.4	16.1	1	1	1018	-0.10	0.00	14.3
30/09/2023 15:35	0.0	3.4	16.0	2	1	1018	-0.25	0.00	14.4
30/09/2023 16:35	0.0	3.6	15.8	2	1	1017	-0.38	0.00	14.5
30/09/2023 17:35	0.0	3.7	15.2	2	1	1017	-0.40	0.00	14.5
30/09/2023 18:35	0.0	4.6	11.4	3	1	1016	-0.44	0.00	14.5
30/09/2023 19:35	0.0	5.2	7.5	3	1	1015	-0.46	0.21	14.4
30/09/2023 20:35	0.0	5.5	5.8	3	1	1015	-0.42	0.21	14.3
30/09/2023 21:35	0.0	5.7	4.7	3	1	1014	-0.49	0.27	14.3
30/09/2023 22:35	0.0	6.0	3.6	4	1	1013	-0.51	0.30	14.2
30/09/2023 23:35	0.0	6.4	2.6	5	1	1013	-0.54	0.35	14.1
01/10/2023 00:35	0.0	6.9	1.8	7	1	1012	-0.54	0.35	14.1
01/10/2023 01:35	0.0	7.2	1.2	9	1	1012	-0.54	0.30	14.1
01/10/2023 02:35	0.0	7.6	0.8	10	1	1012	-0.48	0.30	14.1
01/10/2023 03:35	0.0	8.1	0.4	10	1	1011	-0.46	0.30	14.1
01/10/2023 04:35	0.0	8.4	0.2	9	1	1011	-0.38	0.27	14.1
01/10/2023 05:35	0.0	8.7	0.0	9	1	1011	-0.27	0.38	14.2
01/10/2023 06:35	0.0	9.1	0.0	8	1	1011	-0.17	0.38	14.3
01/10/2023 07:35	0.0	9.1	0.0	7	1	1011	-0.10	0.30	14.3
01/10/2023 08:35	0.0	9.4	0.0	6	1	1012	-0.03	0.18	14.4
01/10/2023 09:35	0.0	9.6	0.0	6	1	1012	0.04	0.18	14.4
01/10/2023 10:35	0.0	9.6	0.0	5	1	1012	0.12	0.00	14.5
01/10/2023 11:35	0.0	9.6	0.0	4	1	1013	0.19	0.00	14.6
01/10/2023 12:35	0.0	9.7	0.0	4	1	1013	0.16	0.00	14.8
01/10/2023 13:35	0.0	9.7	0.0	3	1	1013	0.13	0.00	15.0
01/10/2023 14:35	0.0	9.7	0.0	3	1	1013	0.16	0.00	15.3
01/10/2023 15:35	0.0	9.9	0.0	3	1	1012	0.08	0.00	15.4
01/10/2023 16:35	0.0	9.9	0.0	3	1	1012	0.03	0.00	15.7
01/10/2023 17:35	0.0	9.9	0.0	4	1	1012	-0.04	0.00	15.9
01/10/2023 18:35	0.0	9.7	0.0	4	1	1012	-0.07	0.00	16.1
01/10/2023 19:35	0.0	9.9	0.0	4	1	1012	-0.05	0.00	16.1
01/10/2023 20:35	0.0	9.9	0.0	3	1	1013	0.00	0.00	16.1
01/10/2023 21:35	0.0	10.1	0.0	3	1	1013	0.02	0.00	16.1
01/10/2023 22:35	0.0	10.1	0.0	3	1	1013	0.06	0.00	15.9
01/10/2023 23:35	0.0	9.9	0.9	2	1	1013	0.10	0.00	15.8
02/10/2023 00:35	0.0	9.7	1.7	2	1	1013	0.10	0.00	15.6
02/10/2023 01:35	0.0	9.6	2.2	2	1	1013	0.08	0.00	15.4
02/10/2023 02:35	0.0	9.4	2.6	2	1	1013	0.06	0.00	15.3
02/10/2023 03:35	0.0	9.6	2.8	2	1	1013	0.01	0.00	15.1
02/10/2023 04:35	0.0	9.4	2.9	2	1	1013	-0.03	0.00	14.9
02/10/2023 05:35	0.0	9.6	2.8	2	1	1012	-0.09	0.00	14.8
02/10/2023 06:35	0.0	9.6	2.6	2	1	1012	-0.08	0.00	14.6
02/10/2023 07:35	0.0	9.9	2.4	2	1	1012	-0.05	0.00	14.4
02/10/2023 08:35	0.0	9.7	2.2	1	1	1013	0.00	0.00	14.3
02/10/2023 09:35	0.0	9.9	2.1	2	1	1013	0.06	0.00	14.2
02/10/2023 10:35	0.0	9.9	2.2	2	1	1013	0.08	0.00	14.2
02/10/2023 11:35	0.0	9.9	2.5	2	1	1014	0.16	0.00	14.3
02/10/2023 12:35	0.0	9.9	2.8	2	1	1013	0.11	0.00	14.4
02/10/2023 13:35	0.0	9.9	2.7	2	1	1013	0.04	0.00	14.6
02/10/2023 14:35	0.0	9.9	2.3	3	1	1012	0.00	0.18	14.8
02/10/2023 15:35	0.0	10.1	1.8	4	1	1012	-0.12	0.27	14.9
02/10/2023 16:35	0.0	10.4	0.9	4	1	1011	-0.31	0.35	15.0
02/10/2023 17:35	0.0	10.5	0.2	4	1	1010	-0.38	0.35	15.1
02/10/2023 18:35	0.0	10.7	0.0	4	1	1009	-0.59	0.46	15.1
02/10/2023 19:35	0.0	10.9	0.0	5	1	1009	-0.53	0.35	15.1
02/10/2023 20:35	0.0	11.0	0.0	4	1	1009	-0.45	0.30	15.0
02/10/2023 21:35	0.0	11.2	0.0	4	1	1009	-0.43	0.43	14.9
02/10/2023 22:35	0.0	11.5	0.0	4	1	1008	-0.48	0.59	14.8
02/10/2023 23:35	0.0	11.7	0.0	3	1	1008	-0.38	0.59	14.8
03/10/2023 00:35	0.0	11.9	0.0	4	1	1007	-0.44	0.77	14.6
03/10/2023 01:35	0.0	11.9	0.0	3	1	1007	-0.28	0.51	14.5
03/10/2023 02:35	0.0	12.4	0.0	3	1	1007	-0.29	0.51	14.4
03/10/2023 03:35	0.0	12.4	0.0	3	1	1006	-0.34	0.41	14.3
03/10/2023 04:35	0.0	12.6	0.0	2	1	1006	-0.36	0.51	14.2
03/10/2023 05:35	0.0	12.8	0.0	2	1	1006	-0.22	0.32	14.1
03/10/2023 06:35	0.0	12.8	0.0	3	1	1006	-0.19	0.32	13.8
03/10/2023 07:35	0.0	12.9	0.0	2	1	1006	-0.05	0.21	13.7
03/10/2023 08:35	0.0	12.8	0.0	2	1	1007	0.06	0.00	13.5
03/10/2023 09:35	0.0	12.8	0.0	2	1	1008	0.20	-0.18	13.4
03/10/2023 10:35	0.0	12.9	0.0	1	1	1009	0.38	-0.41	13.4
03/10/2023 11:35	0.0	11.9	0.0	0	1	1010	0.52	-0.35	13.4
03/10/2023 12:35	0.0	11.2	0.4	0	1	1011	0.55	-0.27	13.6
03/10/2023 13:35	0.0	10.7	0.8	1	1	1011	0.58	-0.41	13.8
03/10/2023 14:35	0.0	10.0	1.2	1	1	1011	0.62	-0.49	14.1
03/10/2023 15:35	0.0	9.4	1.5	1	1	1012	0.57	-0.54	14.3
03/10/2023 16:35	0.0	9.1	1.8	1	1	1013	0.55	-0.51	14.5
03/10/2023 17:35	0.0	8.4	2.2	2	1	1013	0.50	-0.59	14.6
03/10/2023 18:35	0.0	7.7	2.6	2	1	1014	0.48	-0.67	14.7
03/10/2023 19:35	0.0	7.2	3.1	2	1	1015	0.54	-0.69	14.6
03/10/2023 20:35	0.0	6.5	3.6	2	1	1016	0.63	-0.69	14.5
03/10/2023 21:35	0.0	6.2	4.2	3	1	1017	0.67	-0.72	14.4
03/10/2023 22:35	0.0	5.9	4.7	2	1	1017	0.65	-0.74	14.3
03/10/2023 23:35	0.0	5.7	5.1	1	1	1017	0.60	-0.64	14.2
04/10/2023 00:35	0.0	5.5	5.5	2	1	1017	0.49	-0.62	14.0
04/10/2023 01:35	0.0	5.5	5.8	2	1	1018	0.45	-0.54	13.9
04/10/2023 02:35	0.0	5.7	6.0	2	1	1017	0.30	-0.41	13.8
04/10/2023 03:35	0.0	6.0	6.2	2	1	1017	0.18	-0.27	13.7
04/10/2023 04:35	0.0	6.0	6.3	2	1	1017	0.07	-0.32	13.6
04/10/2023 05:35	0.0	6.4	6.3	2	1	1017	0.00	-0.24	13.6
04/10/2023 06:35	0.0	6.5	6.3	2	1	1017	-0.06	-0.18	13.6

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
04/10/2023 07:35	0.0	6.7	6.3	2	1	1017	-0.06	0.00	13.5
04/10/2023 08:35	0.0	6.9	6.3	2	1	1017	-0.13	0.00	13.4
04/10/2023 09:35	0.0	6.9	6.3	1	1	1017	-0.06	0.00	13.4
04/10/2023 10:35	0.0	7.0	6.2	2	1	1017	-0.06	0.00	13.4
04/10/2023 11:35	0.0	7.2	6.2	3	1	1017	-0.01	0.00	13.4
04/10/2023 12:35	0.0	7.2	6.2	2	1	1017	-0.03	0.00	13.4
04/10/2023 13:35	0.0	7.6	6.0	3	1	1016	-0.05	0.21	13.6
04/10/2023 14:35	0.0	7.7	5.9	2	1	1016	-0.13	0.21	13.8
04/10/2023 15:35	0.0	7.9	5.6	2	1	1016	-0.12	0.27	14.1
04/10/2023 16:35	0.0	8.1	5.1	2	1	1015	-0.20	0.21	14.4
04/10/2023 17:35	0.0	8.4	4.1	3	1	1015	-0.22	0.30	14.6
04/10/2023 18:35	0.0	8.7	3.0	3	1	1015	-0.28	0.27	14.7
04/10/2023 19:35	0.0	9.1	2.1	3	1	1015	-0.24	0.00	14.8
04/10/2023 20:35	0.0	9.2	1.4	4	1	1015	-0.18	0.00	14.7
04/10/2023 21:35	0.0	9.4	0.9	4	1	1015	-0.13	0.00	14.6
04/10/2023 22:35	0.0	9.6	0.5	3	1	1015	-0.04	0.00	14.5
04/10/2023 23:35	0.0	9.7	0.3	2	1	1015	-0.03	0.00	14.4
05/10/2023 00:35	0.0	9.7	0.1	3	1	1015	0.00	0.00	14.3
05/10/2023 01:35	0.0	9.8	0.0	2	1	1015	0.01	0.00	14.3
05/10/2023 02:35	0.0	10.0	0.0	3	1	1015	0.01	0.00	14.2
05/10/2023 03:35	0.0	10.4	0.0	2	1	1015	0.01	0.00	14.1
05/10/2023 04:35	0.0	10.2	0.0	2	1	1015	0.03	0.00	14.1
05/10/2023 05:35	0.0	10.2	0.0	1	1	1015	-0.03	0.00	14.0
05/10/2023 06:35	0.0	10.2	0.0	1	1	1015	0.02	0.00	13.9
05/10/2023 07:35	0.0	10.4	0.0	1	1	1015	0.03	0.00	13.9
05/10/2023 08:35	0.0	10.5	0.0	0	1	1015	0.08	0.00	13.9
05/10/2023 09:35	0.0	10.4	0.0	1	1	1016	0.14	0.00	13.9
05/10/2023 10:35	0.0	10.4	0.4	0	1	1017	0.18	-0.24	13.9
05/10/2023 11:35	0.0	10.2	1.3	0	1	1017	0.24	-0.18	13.9
05/10/2023 12:35	0.0	9.9	2.2	0	1	1017	0.21	0.00	14.1
05/10/2023 13:35	0.0	9.7	2.7	0	1	1016	0.11	0.00	14.3
05/10/2023 14:35	0.0	9.6	3.0	1	1	1016	0.04	0.21	14.4
05/10/2023 15:35	0.0	9.7	3.0	0	1	1015	-0.04	0.21	14.4
05/10/2023 16:35	0.0	9.9	2.6	0	1	1014	-0.20	0.27	14.5
05/10/2023 17:35	0.0	10.2	1.7	1	1	1014	-0.31	0.35	14.6
05/10/2023 18:35	0.0	10.4	0.8	2	1	1013	-0.46	0.38	14.6
05/10/2023 19:35	0.0	10.7	0.1	2	1	1013	-0.45	0.21	14.6
05/10/2023 20:35	0.0	11.0	0.0	2	1	1013	-0.43	0.43	14.6
05/10/2023 21:35	0.0	11.2	0.0	3	1	1013	-0.37	0.38	14.5
05/10/2023 22:35	0.0	11.5	0.0	2	1	1013	-0.33	0.30	14.5
05/10/2023 23:35	0.0	11.7	0.0	2	1	1012	-0.26	0.35	14.5
06/10/2023 00:35	0.0	11.7	0.0	2	1	1013	-0.17	0.30	14.4
06/10/2023 01:35	0.0	11.9	0.0	2	1	1012	-0.14	0.35	14.4
06/10/2023 02:35	0.0	12.1	0.0	2	1	1012	-0.17	0.30	14.4
06/10/2023 03:35	0.0	12.4	0.0	1	1	1011	-0.18	0.46	14.4
06/10/2023 04:35	0.0	12.4	0.0	1	1	1011	-0.17	0.35	14.4
06/10/2023 05:35	0.0	12.6	0.0	1	1	1011	-0.25	0.38	14.5
06/10/2023 06:35	0.0	12.6	0.0	1	1	1011	-0.21	0.38	14.5
06/10/2023 07:35	0.0	12.8	0.0	0	1	1011	-0.22	0.30	14.5
06/10/2023 08:35	0.0	12.8	0.0	1	1	1012	-0.06	0.00	14.6
06/10/2023 09:35	0.0	12.8	0.0	0	1	1012	0.04	0.00	14.6
06/10/2023 10:35	0.0	12.9	0.0	1	1	1012	0.14	0.00	14.6
06/10/2023 11:35	0.0	13.1	0.0	1	1	1012	0.14	0.00	14.7
06/10/2023 12:35	0.0	12.9	0.0	1	1	1013	0.29	0.00	14.8
06/10/2023 13:35	0.0	12.9	0.0	0	1	1013	0.23	0.00	14.9
06/10/2023 14:35	0.0	12.9	0.0	1	1	1012	0.11	0.18	15.0
06/10/2023 15:35	0.0	13.1	0.0	0	1	1012	0.01	0.00	15.1
06/10/2023 16:35	0.0	13.1	0.0	1	1	1011	-0.10	0.00	15.3
06/10/2023 17:35	0.0	12.9	0.0	1	1	1012	-0.04	0.00	15.4
06/10/2023 18:35	0.0	13.1	0.0	0	1	1013	0.03	0.00	15.4
06/10/2023 19:35	0.0	13.1	0.0	0	1	1013	0.03	0.00	15.5
06/10/2023 20:35	0.0	12.9	0.0	0	1	1013	0.10	-0.18	15.5
06/10/2023 21:35	0.0	12.4	0.0	0	1	1013	0.14	0.00	15.5
06/10/2023 22:35	0.0	12.4	0.5	0	1	1013	0.18	-0.24	15.5
06/10/2023 23:35	0.0	12.1	0.9	0	1	1013	0.25	-0.18	15.5
07/10/2023 00:35	0.0	11.9	1.3	0	1	1013	0.16	-0.18	15.5
07/10/2023 01:35	0.0	11.7	1.7	0	1	1013	0.05	0.00	15.5
07/10/2023 02:35	0.0	11.5	1.9	0	1	1013	0.01	0.00	15.4
07/10/2023 03:35	0.0	11.7	2.0	0	1	1013	-0.10	0.00	15.4
07/10/2023 04:35	0.0	11.5	2.0	0	1	1013	-0.04	0.00	15.4
07/10/2023 05:35	0.0	11.7	2.0	0	1	1013	-0.03	0.00	15.3
07/10/2023 06:35	0.0	11.9	1.9	0	1	1013	-0.09	0.18	15.3
07/10/2023 07:35	0.0	11.9	1.8	0	1	1012	-0.12	0.00	15.2
07/10/2023 08:35	0.0	12.1	1.7	0	1	1013	0.04	0.00	15.1
07/10/2023 09:35	0.0	11.9	1.9	0	1	1014	0.05	-0.18	15.1
07/10/2023 10:35	0.0	11.7	2.3	0	1	1014	0.19	-0.18	15.0
07/10/2023 11:35	0.0	11.5	2.9	0	1	1014	0.17	0.00	15.0
07/10/2023 12:35	0.0	11.0	3.3	0	1	1014	0.17	-0.24	15.0
07/10/2023 13:35	0.0	10.9	3.6	0	1	1014	0.20	0.00	15.1
07/10/2023 14:35	0.0	10.7	3.8	0	1	1015	0.30	0.00	15.1
07/10/2023 15:35	0.0	10.5	4.0	0	1	1015	0.18	0.00	15.3
07/10/2023 16:35	0.0	10.5	4.1	1	1	1015	0.16	0.00	15.6
07/10/2023 17:35	0.0	10.4	4.2	1	1	1015	0.14	-0.24	15.9
07/10/2023 18:35	0.0	10.2	4.5	1	1	1015	0.15	-0.21	16.0
07/10/2023 19:35	0.0	10.0	4.7	2	1	1016	0.18	-0.32	16.1
07/10/2023 20:35	0.0	9.7	5.0	1	1	1016	0.23	-0.30	16.1
07/10/2023 21:35	0.0	9.4	5.3	2	1	1017	0.23	-0.38	16.0
07/10/2023 22:35	0.0	9.1	5.5	2	1	1017	0.28	-0.51	15.9
07/10/2023 23:35	0.0	8.7	5.9	2	1	1018	0.41	-0.51	15.8
08/10/2023 00:35	0.0	8.4	6.2	3	1	1018	0.36	-0.49	15.8
08/10/2023 01:35	0.0	8.1	6.6	2	1	1019	0.47	-0.54	15.7
08/10/2023 02:35	0.0	7.7	6.9	2	1	1020	0.49	-0.54	15.6
08/10/2023 03:35	0.0	7.7	7.2	3	1	1020	0.43	-0.41	15.4
08/10/2023 04:35	0.0	7.4	7.5	2	1	1020	0.37	-0.41	15.4
08/10/2023 05:35	0.0	7.4	7.7	2	1	1020	0.34	-0.41	15.3
08/10/2023 06:35	0.0	7.4	7.8	2	1	1020	0.21	-0.27	15.2
08/10/2023 07:35	0.0	7.6	8.0	2	1	1019	0.17	-0.24	15.1
08/10/2023 08:35	0.0	7.6	8.0	2	1	1019	0.06	-0.24	15.1
08/10/2023 09:35	0.0	7.7	8.1	2	1	1020	0.00	-0.24	15.0
08/10/2023 10:35	0.0	7.7	8.2	1	1	1020	0.04	-0.27	15.0
08/10/2023 11:35	0.0	7.9	8.2	1	1	1020	0.01	0.00	15.0
08/10/2023 12:35	0.0	7.9	8.2	2	1	1020	-0.03	0.00	15.1
08/10/2023 13:35	0.0	8.2	8.1	1	1	1019	-0.06	0.00	15.3
08/10/2023 14:35	0.0	8.4	8.0	1	1	1018	-0.16	0.30	15.4
08/10/2023 15:35	0.0	8.6	7.7	1	1	1018	-0.17	0.30	15.7
08/10/2023 16:35	0.0	9.1	6.8	2	1	1017	-0.35	0.35	15.9
08/10/2023 17:35	0.0	9.6	5.0	3	1	1016	-0.44	0.35	16.0
08/10/2023 18:35	0.0	9.9	3.5	3	1	1016	-0.44	0.35	16.1
08/10/2023 19:35	0.0	10.4	2.3	4	1	1016	-0.44	0.30	16.1
08/10/2023 20:35	0.0	10.9	1.4	5	1	1016	-0.42	0.30	16.1
08/10/2023 21:35	0.0	11.0	0.8	6	1	1016	-0.28	0.21	16.1
08/10/2023 22:35	0.0	11.4	0.3	7	1	1016	-0.27	0.21	16.0
08/10/2023 23:35	0.0	11.4	0.0	7	1	1016	-0.14	0.35	15.9
09/10/2023 00:35	0.0	11.7	0.0	8	1	1015	-0.16	0.38	15.9
09/10/2023 01:35	0.0	12.1	0.0	7	1	1015	-0.15	0.35	15.8
09/10/2023 02:35	0.0	12.1	0.0	7	1	1015	-0.15	0.21	15.8
09/10/2023 03:35	0.0	12.2	0.0	6	1	1015	-0.15	0.21	15.8
09/10/2023 04:35	0.0	12.4	0.0	5	1	1014	-0.18	0.21	15.7

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
09/10/2023 05:35	0.0	12.4	0.0	4	1	1015	-0.10	0.00	15.7
09/10/2023 06:35	0.0	12.8	0.0	2	1	1015	-0.03	0.00	15.6
09/10/2023 07:35	0.0	12.8	0.0	2	1	1015	0.04	0.00	15.6
09/10/2023 08:35	0.0	12.8	0.0	1	1	1016	0.07	0.00	15.6
09/10/2023 09:35	0.0	12.8	0.0	1	1	1016	0.15	0.00	15.6
09/10/2023 10:35	0.0	12.8	0.0	0	1	1017	0.22	0.00	15.5
09/10/2023 11:35	0.0	12.8	0.0	0	1	1017	0.31	-0.18	15.6
09/10/2023 12:35	0.0	12.8	0.6	0	1	1017	0.31	-0.21	15.8
09/10/2023 13:35	0.0	12.4	1.4	0	1	1017	0.21	0.00	16.1
09/10/2023 14:35	0.0	12.4	1.9	0	1	1016	0.13	0.00	16.4
09/10/2023 15:35	0.0	12.2	2.0	0	1	1016	0.05	0.00	16.7
09/10/2023 16:36	0.0	12.4	1.7	1	1	1016	-0.06	0.18	16.9
09/10/2023 17:36	0.0	12.6	1.2	1	1	1015	-0.18	0.18	17.1
09/10/2023 18:36	0.0	12.8	0.7	1	1	1015	-0.26	0.27	17.1
09/10/2023 19:35	0.0	12.8	0.1	2	1	1015	-0.33	0.00	17.1
09/10/2023 20:35	0.0	12.9	0.0	1	1	1015	-0.29	0.00	16.9
09/10/2023 21:35	0.0	12.9	0.0	1	1	1014	-0.28	0.21	16.8
09/10/2023 22:35	0.0	12.9	0.0	1	1	1014	-0.23	0.27	16.7
09/10/2023 23:35	0.0	13.3	0.0	1	1	1014	-0.22	0.30	16.5
10/10/2023 00:35	0.0	13.3	0.0	1	1	1013	-0.25	0.35	16.4
10/10/2023 01:35	0.0	13.4	0.0	1	1	1013	-0.28	0.43	16.3
10/10/2023 02:35	0.0	13.6	0.0	1	1	1012	-0.33	0.43	16.1
10/10/2023 03:35	0.0	13.6	0.0	2	1	1012	-0.36	0.38	16.1
10/10/2023 04:35	0.0	13.6	0.0	0	1	1012	-0.34	0.43	15.9
10/10/2023 05:35	0.0	13.6	0.0	1	1	1011	-0.44	0.46	15.8
10/10/2023 06:35	0.0	13.9	0.0	0	1	1011	-0.42	0.46	15.8
10/10/2023 07:35	0.0	13.9	0.0	0	1	1010	-0.43	0.46	15.6
10/10/2023 08:36	0.0	14.1	0.0	0	1	1010	-0.40	0.43	15.6
10/10/2023 09:35	0.0	14.1	0.0	0	1	1010	-0.29	0.35	15.5
10/10/2023 10:35	0.0	14.2	0.0	0	1	1010	-0.27	0.38	15.5
10/10/2023 11:35	0.0	14.2	0.0	0	1	1009	-0.29	0.43	15.5
10/10/2023 12:35	0.0	14.4	0.0	0	1	1009	-0.22	0.46	15.6
10/10/2023 13:35	0.0	14.2	0.0	0	1	1008	-0.26	0.46	15.9
10/10/2023 14:35	0.0	14.4	0.0	0	1	1008	-0.26	0.51	16.1
10/10/2023 15:35	0.0	14.2	0.0	0	1	1007	-0.30	0.56	16.3
10/10/2023 16:36	0.0	14.2	0.0	1	1	1006	-0.45	0.59	16.5
10/10/2023 17:36	0.0	14.2	0.0	1	1	1006	-0.51	0.59	16.7
10/10/2023 18:35	0.0	14.6	0.0	0	1	1005	-0.53	0.51	16.7
10/10/2023 19:35	0.0	14.4	0.0	0	1	1005	-0.53	0.56	16.6
10/10/2023 20:35	0.0	14.7	0.0	0	1	1004	-0.50	0.43	16.6
10/10/2023 21:35	0.0	14.6	0.0	0	1	1005	-0.38	0.43	16.4
10/10/2023 22:35	0.0	14.6	0.0	0	1	1004	-0.39	0.46	16.3
10/10/2023 23:35	0.0	14.6	0.0	0	1	1004	-0.30	0.46	16.2
11/10/2023 00:35	0.0	14.6	0.0	0	1	1004	-0.24	0.35	16.1
11/10/2023 01:35	0.0	14.7	0.0	0	1	1003	-0.27	0.46	16.1
11/10/2023 02:35	0.0	14.6	0.0	0	1	1003	-0.21	0.43	16.0
11/10/2023 03:35	0.0	14.7	0.0	0	1	1003	-0.21	0.43	16.0
11/10/2023 04:35	0.0	14.7	0.0	0	1	1003	-0.23	0.38	15.9
11/10/2023 05:35	0.0	14.9	0.0	0	1	1002	-0.30	0.56	15.9
11/10/2023 06:35	0.0	14.6	0.0	0	1	1002	-0.24	0.35	15.8
11/10/2023 07:35	0.0	14.7	0.0	0	1	1002	-0.24	0.27	15.8
11/10/2023 08:35	0.0	14.7	0.0	0	1	1002	-0.09	0.27	15.7
11/10/2023 09:35	0.0	14.6	0.0	0	0	1003	0.00	0.00	15.6
11/10/2023 10:35	0.0	14.9	0.0	0	0	1004	0.17	-0.18	15.6
11/10/2023 11:35	0.0	14.9	0.0	0	0	1005	0.23	-0.18	15.5
11/10/2023 12:35	0.0	14.7	0.0	0	1	1005	0.43	-0.18	15.4
11/10/2023 13:35	0.0	14.4	0.0	0	1	1005	0.36	0.00	15.4
11/10/2023 14:36	0.0	14.1	0.6	0	1	1005	0.36	0.00	15.4
11/10/2023 15:35	0.0	14.1	1.1	0	1	1005	0.36	0.00	15.3
11/10/2023 16:35	0.0	13.9	1.5	0	1	1005	0.26	0.00	15.2
11/10/2023 17:35	0.0	13.8	2.0	0	1	1005	0.13	0.00	15.1
11/10/2023 18:35	0.0	13.6	2.5	0	1	1006	0.13	-0.18	15.0
11/10/2023 19:35	0.0	13.4	3.1	0	1	1006	0.11	-0.24	14.9
11/10/2023 20:35	0.0	12.9	3.8	0	1	1007	0.23	-0.32	14.8
11/10/2023 21:35	0.0	12.4	4.5	0	1	1007	0.32	-0.39	14.7
11/10/2023 22:35	0.0	11.7	5.0	0	1	1007	0.31	-0.27	14.6
11/10/2023 23:35	0.0	11.4	5.5	0	1	1008	0.36	-0.27	14.4
12/10/2023 00:35	0.0	11.0	5.9	0	1	1008	0.30	-0.24	14.2
12/10/2023 01:35	0.0	10.7	6.3	0	1	1008	0.26	-0.24	13.9
12/10/2023 02:35	0.0	10.6	6.6	0	1	1008	0.25	-0.24	13.8
12/10/2023 03:35	0.0	10.4	7.0	0	1	1008	0.17	-0.21	13.5
12/10/2023 04:36	0.0	10.0	7.3	0	1	1008	0.11	-0.18	13.3
12/10/2023 05:35	0.0	10.1	7.6	0	1	1008	0.11	-0.21	13.0
12/10/2023 06:36	0.0	10.0	7.8	1	1	1008	0.05	-0.21	12.8
12/10/2023 07:35	0.0	9.9	8.1	0	1	1009	0.14	-0.21	12.6
12/10/2023 08:35	0.0	9.6	8.3	0	1	1009	0.15	-0.27	12.4
12/10/2023 09:35	0.0	9.6	8.5	0	1	1010	0.24	-0.21	12.1
12/10/2023 10:35	0.0	9.6	8.7	0	1	1010	0.27	-0.18	12.1
12/10/2023 11:35	0.0	9.4	8.9	0	1	1010	0.25	-0.18	12.1
12/10/2023 12:35	0.0	9.2	9.0	0	1	1010	0.18	0.00	12.3
12/10/2023 13:35	0.0	9.4	9.1	1	1	1009	0.09	0.00	12.4
12/10/2023 14:35	0.0	9.6	9.1	1	1	1008	-0.06	0.18	12.8
12/10/2023 15:35	0.0	9.7	8.9	1	1	1007	-0.19	0.21	13.1
12/10/2023 16:35	0.0	10.1	8.0	1	1	1007	-0.40	0.35	13.4
12/10/2023 17:35	0.0	10.7	6.2	2	1	1006	-0.50	0.30	13.6
12/10/2023 18:35	0.0	11.4	4.3	3	1	1006	-0.53	0.30	13.6
12/10/2023 19:35	0.0	11.9	2.9	3	1	1006	-0.48	0.27	13.5
12/10/2023 20:35	0.0	12.2	1.8	3	1	1005	-0.45	0.30	13.3
12/10/2023 21:35	0.0	12.6	0.9	5	1	1004	-0.48	0.38	13.1
12/10/2023 22:35	0.0	13.3	0.2	7	1	1004	-0.46	0.41	13.0
12/10/2023 23:35	0.0	13.4	0.0	8	1	1003	-0.52	0.54	12.9
13/10/2023 00:35	0.0	13.8	0.0	7	1	1001	-0.61	0.64	12.8
13/10/2023 01:35	0.0	14.1	0.0	7	1	1000	-0.70	0.69	12.8
13/10/2023 02:35	0.0	14.2	0.0	6	1	999	-0.88	0.79	12.8
13/10/2023 03:35	0.0	14.4	0.0	5	1	997	-0.98	0.94	12.8
13/10/2023 04:35	0.0	14.7	0.0	4	1	996	-1.10	1.38	12.8
13/10/2023 05:36	0.0	14.9	0.0	3	1	994	-1.26	1.70	12.8
13/10/2023 06:35	0.0	14.9	0.0	2	1	992	-1.31	2.14	12.8
13/10/2023 07:35	0.0	14.9	0.0	2	1	991	-1.24	1.99	12.8
13/10/2023 08:35	0.0	14.7	0.0	1	1	991	-1.21	1.99	12.8
13/10/2023 09:35	0.0	14.9	0.0	1	1	991	-0.99	1.55	12.8
13/10/2023 10:35	0.0	14.9	0.0	0	1	991	-0.85	1.51	12.8
13/10/2023 11:35	0.0	14.8	0.0	0	1	992	-0.49	1.06	12.9
13/10/2023 12:35	0.0	14.9	0.0	0	1	992	-0.22	0.92	12.9
13/10/2023 13:35	0.0	14.7	0.0	0	1	992	0.04	0.67	13.1
13/10/2023 14:35	0.0	15.1	0.0	0	1	993	0.21	0.59	13.2
13/10/2023 15:35	0.0	14.7	0.0	0	0	993	0.31	0.43	13.2
13/10/2023 16:35	0.0	14.7	0.0	0	0	993	0.28	0.35	13.3
13/10/2023 17:35	0.0	15.1	0.0	0	0	994	0.40	0.21	13.3
13/10/2023 18:35	0.0	14.9	0.0	0	0	994	0.30	0.00	13.2
13/10/2023 19:35	0.0	14.9	0.0	0	0	995	0.38	-0.18	13.1
13/10/2023 20:35	0.0	14.8	0.0	0	0	996	0.44	-0.41	13.0
13/10/2023 21:35	0.0	14.4	0.0	0	0	997	0.45	-0.64	12.8
13/10/2023 22:35	0.0	13.3	0.0	0	0	998	0.62	-0.79	12.6
13/10/2023 23:35	0.0	12.1	0.0	0	0	999	0.72	-0.84	12.5
14/10/2023 00:35	0.0	10.7	0.4	0	0	1000	0.72	-0.87	12.3
14/10/2023 01:35	0.0	9.4	1.1	0	0	1001	0.84	-1.09	12.1
14/10/2023 02:35	0.0	8.3	1.7	0	0	1002	0.88	-1.19	12.0


 Experts in Continuous Monitoring

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
14/10/2023 03:35	0.0	7.4	2.3	0	0	1003	0.86	-1.01	11.8
14/10/2023 04:35	0.0	6.7	2.8	0	1	1003	0.84	-1.11	11.7
14/10/2023 05:35	0.0	6.0	3.4	0	1	1004	0.80	-1.19	11.5
14/10/2023 06:35	0.0	5.7	3.9	0	1	1005	0.76	-1.21	11.4
14/10/2023 07:35	0.0	5.2	4.4	0	1	1006	0.84	-1.33	11.3
14/10/2023 08:35	0.0	4.7	4.9	0	1	1008	0.87	-1.48	11.1
14/10/2023 09:35	0.0	4.2	5.4	0	1	1009	0.93	-1.51	10.9
14/10/2023 10:35	0.0	3.9	5.8	0	1	1011	0.99	-1.48	10.9
14/10/2023 11:35	0.0	3.9	6.1	0	1	1011	1.02	-1.46	10.9
14/10/2023 12:35	0.0	3.9	6.5	0	1	1012	0.95	-1.36	11.1
14/10/2023 13:35	0.0	4.1	6.8	0	1	1012	0.85	-1.16	11.2
14/10/2023 14:35	0.0	4.1	7.1	0	1	1012	0.76	-1.14	11.4
14/10/2023 15:35	0.0	4.2	7.4	0	1	1013	0.62	-1.11	11.6
14/10/2023 16:35	0.0	4.6	7.7	0	1	1013	0.42	-0.99	11.8
14/10/2023 17:35	0.0	4.7	7.9	0	1	1013	0.27	-0.89	11.9
14/10/2023 18:35	0.0	4.9	8.2	0	1	1013	0.22	-0.84	11.8
14/10/2023 19:35	0.0	4.9	8.4	0	1	1014	0.22	-0.94	11.7
14/10/2023 20:35	0.0	4.7	8.7	0	1	1015	0.32	-1.16	11.5
14/10/2023 21:35	0.0	4.6	8.9	0	1	1015	0.34	-1.04	11.3
14/10/2023 22:35	0.0	4.4	9.2	0	1	1016	0.39	-0.99	11.1
14/10/2023 23:36	0.0	4.4	9.4	0	1	1016	0.45	-1.06	10.9
15/10/2023 00:35	0.0	4.4	9.6	0	1	1017	0.49	-0.99	10.7
15/10/2023 01:35	0.0	4.4	9.8	0	1	1017	0.51	-0.94	10.4
15/10/2023 02:35	0.0	4.2	10.0	0	1	1018	0.52	-1.01	10.2
15/10/2023 03:35	0.0	4.2	10.2	0	1	1018	0.45	-0.92	10.0
15/10/2023 04:35	0.0	4.4	10.3	0	1	1018	0.39	-0.79	9.8
15/10/2023 05:35	0.0	4.4	10.5	0	1	1019	0.38	-0.92	9.6
15/10/2023 06:35	0.0	4.4	10.6	0	1	1020	0.41	-0.92	9.4
15/10/2023 07:35	0.0	4.4	10.7	0	1	1020	0.35	-0.77	9.3
15/10/2023 08:35	0.0	4.4	10.9	0	1	1020	0.35	-0.84	9.1
15/10/2023 09:36	0.0	4.4	11.0	0	1	1021	0.43	-0.82	9.0
15/10/2023 10:36	0.0	4.4	11.1	0	1	1022	0.45	-0.77	8.9
15/10/2023 11:35	0.0	4.6	11.1	0	1	1022	0.49	-0.74	9.0
15/10/2023 12:36	0.0	4.7	11.2	0	1	1022	0.42	-0.67	9.2
15/10/2023 13:35	0.0	4.9	11.2	0	1	1022	0.31	-0.49	9.4
15/10/2023 14:35	0.0	5.4	11.2	0	1	1021	0.24	-0.35	9.7
15/10/2023 15:35	0.0	5.7	11.1	0	1	1021	0.13	-0.32	10.1
15/10/2023 16:35	0.0	6.0	11.2	0	1	1021	-0.06	-0.24	10.4
15/10/2023 17:35	0.0	6.2	11.2	0	1	1021	-0.13	-0.32	10.6
15/10/2023 18:35	0.0	6.4	11.2	0	1	1021	-0.17	-0.27	10.6
15/10/2023 19:35	0.0	6.5	11.2	0	1	1021	-0.19	-0.24	10.6
15/10/2023 20:35	0.0	6.7	11.2	0	1	1021	-0.17	-0.24	10.4
15/10/2023 21:35	0.0	6.9	11.1	0	1	1021	-0.09	-0.21	10.3
15/10/2023 22:35	0.0	7.0	11.1	0	1	1021	-0.05	-0.21	10.2
15/10/2023 23:35	0.0	7.2	11.1	0	1	1020	-0.05	0.00	10.0
16/10/2023 00:35	0.0	7.4	11.0	0	1	1020	-0.03	-0.18	9.8
16/10/2023 01:36	0.0	7.6	10.9	0	0	1020	-0.05	0.00	9.6
16/10/2023 02:36	0.0	7.6	10.8	0	0	1020	-0.09	0.00	9.5
16/10/2023 03:36	0.0	7.9	10.7	0	0	1020	-0.08	0.00	9.3
16/10/2023 04:35	0.0	8.3	10.6	0	0	1020	-0.14	0.21	9.2
16/10/2023 05:35	0.0	8.3	10.4	0	0	1019	-0.17	0.21	9.0
16/10/2023 06:35	0.0	8.6	10.1	0	0	1019	-0.17	0.30	8.9
16/10/2023 07:35	0.0	8.9	9.5	0	0	1019	-0.22	0.24	8.7
16/10/2023 08:35	0.0	9.4	8.0	0	0	1019	-0.19	0.21	8.6
16/10/2023 09:36	0.0	9.9	6.2	0	0	1019	-0.13	0.00	8.5
16/10/2023 10:35	0.0	10.2	4.7	0	0	1019	-0.09	0.00	8.4
16/10/2023 11:35	0.0	10.6	3.5	0	0	1019	-0.03	0.21	8.6
16/10/2023 12:35	0.0	10.7	2.6	0	0	1019	-0.03	0.00	8.7



Experts in Continuous Monitoring

Time Series Data

Project Ref:	GGS3070
Project Name:	Skelton Grange, Phase 2
Borehole ref:	MW2A-04
Instrument Name and ID:	GC50/06/18 FD019
Start Date:	25/09/2023 11:57
End Date:	16/10/2023 12:57
Days of monitoring:	21
Monitoring Frequency (mins):	60
Total samples taken:	506

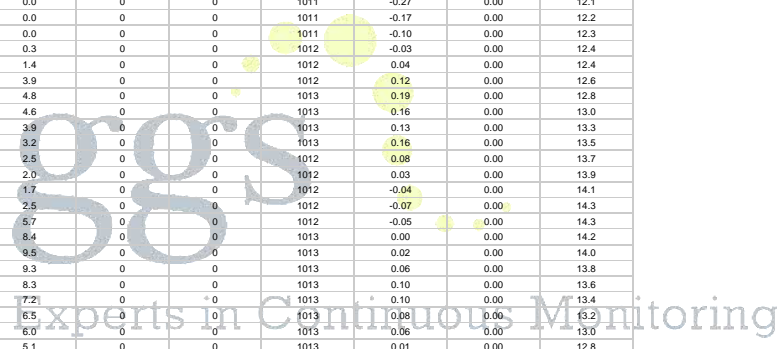


Summary Table

	CH ₄	CO ₂	O ₂	CO	H ₂ S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Flow	Temperature
Minimum	0.0	0.0	0.0	0	0	991	-1.40	-0.03	5.6
Maximum	0.3	11.2	20.4	2	0	1022	1.02	0.03	16.4
Range	0.3	11.2	20.4	2	0	32	2.41	0.06	10.8

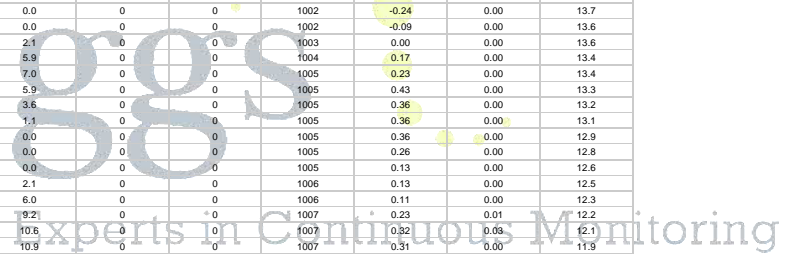
Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
25/09/2023 11:57	0.0	0.8	19.8	0	0	1010	N/A	0.01	16.4
25/09/2023 12:58	0.0	0.0	20.2	0	0	1011	N/A	0.00	15.8
25/09/2023 13:58	0.0	0.0	20.4	0	0	1012	N/A	-0.01	15.6
25/09/2023 14:58	0.0	0.0	20.4	0	0	1012	N/A	-0.01	15.4
25/09/2023 15:58	0.0	0.0	20.4	0	0	1012	N/A	-0.03	15.4
25/09/2023 16:58	0.0	0.0	20.4	0	0	1012	N/A	-0.01	15.3
25/09/2023 17:58	0.0	0.0	20.3	0	0	1012	N/A	0.00	15.3
25/09/2023 18:58	0.0	0.0	20.2	0	0	1013	N/A	0.00	15.2
25/09/2023 19:58	0.0	0.2	20.0	0	0	1013	0.35	0.00	14.9
25/09/2023 20:57	0.0	0.3	19.7	0	0	1013	0.18	0.00	14.7
25/09/2023 21:57	0.0	0.5	19.4	0	0	1014	0.21	0.00	14.4
25/09/2023 22:57	0.0	1.3	18.7	0	0	1014	0.17	0.00	14.2
25/09/2023 23:57	0.0	2.1	17.9	0	0	1013	0.11	0.00	13.9
26/09/2023 00:57	0.0	3.1	17.1	0	0	1013	0.08	0.00	13.6
26/09/2023 01:57	0.0	3.7	16.4	0	0	1013	-0.01	0.00	13.3
26/09/2023 02:57	0.0	4.5	15.6	0	0	1013	-0.08	0.00	13.0
26/09/2023 03:58	0.0	5.3	14.6	0	0	1012	-0.19	0.00	12.8
26/09/2023 04:58	0.0	6.0	13.5	0	0	1012	-0.24	0.00	12.6
26/09/2023 05:58	0.0	6.5	12.0	0	0	1011	-0.33	0.00	12.4
26/09/2023 06:57	0.0	6.9	10.5	0	0	1010	-0.38	0.00	12.2
26/09/2023 07:58	0.0	7.3	9.2	0	0	1010	-0.38	0.00	12.0
26/09/2023 08:57	0.0	7.4	8.0	0	0	1010	-0.34	0.00	11.9
26/09/2023 09:58	0.0	7.9	6.6	0	0	1010	-0.31	0.00	11.9
26/09/2023 10:57	0.0	8.2	5.5	0	0	1009	-0.32	0.00	11.9
26/09/2023 11:58	0.0	8.6	4.4	0	0	1009	-0.35	0.00	11.9
26/09/2023 12:57	0.0	8.9	3.1	0	0	1008	-0.30	0.00	12.1
26/09/2023 13:57	0.0	9.0	2.1	0	0	1008	-0.28	0.00	12.5
26/09/2023 14:57	0.0	8.7	5.0	0	0	1007	-0.39	0.00	12.9
26/09/2023 15:57	0.0	1.9	11.1	0	0	1007	-0.32	-0.01	13.4
26/09/2023 16:57	0.0	0.3	15.8	0	0	1008	-0.31	-0.02	13.8
26/09/2023 17:58	0.0	0.2	17.7	0	0	1008	-0.13	0.00	14.0
26/09/2023 18:57	0.0	0.0	18.3	0	0	1009	-0.01	0.00	14.1
26/09/2023 19:57	0.0	0.2	18.4	0	0	1009	0.09	0.00	13.9
26/09/2023 20:57	0.0	0.2	18.1	0	0	1010	0.22	0.00	13.7
26/09/2023 21:57	0.0	0.2	18.1	0	0	1010	0.33	0.00	13.4
26/09/2023 22:57	0.0	0.4	17.8	0	0	1010	0.38	0.00	13.2
26/09/2023 23:57	0.0	0.4	17.8	0	0	1011	0.39	0.00	12.9
27/09/2023 00:57	0.0	0.4	17.9	0	0	1011	0.36	0.00	12.7
27/09/2023 01:58	0.0	0.4	17.7	0	0	1012	0.41	0.00	12.5
27/09/2023 02:58	0.0	0.7	17.5	0	0	1012	0.35	0.00	12.3
27/09/2023 03:58	0.0	1.9	16.5	0	0	1012	0.28	0.00	12.1
27/09/2023 04:57	0.0	2.7	15.6	0	0	1012	0.25	0.00	11.9
27/09/2023 05:58	0.0	3.2	14.9	0	0	1011	0.11	0.00	11.8
27/09/2023 06:58	0.0	3.7	14.3	0	0	1011	0.09	0.00	11.7
27/09/2023 07:58	0.0	4.1	13.7	0	0	1011	0.04	0.00	11.6
27/09/2023 08:57	0.0	4.6	13.2	0	0	1011	-0.15	0.00	11.5
27/09/2023 09:58	0.0	4.8	12.7	0	0	1012	-0.02	0.00	11.5
27/09/2023 10:57	0.0	5.6	11.6	0	0	1011	-0.08	0.00	11.7
27/09/2023 11:57	0.0	6.5	9.5	0	0	1010	-0.16	0.00	11.9
27/09/2023 12:57	0.0	7.3	6.7	0	0	1009	-0.30	0.00	12.3
27/09/2023 13:57	0.0	8.5	3.2	0	0	1008	-0.46	0.02	12.4
27/09/2023 14:57	0.0	9.7	0.0	0	0	1006	-0.68	0.01	12.6
27/09/2023 15:57	0.0	10.1	0.0	0	0	1005	-0.73	0.00	12.8
27/09/2023 16:57	0.0	10.6	0.0	0	0	1003	-1.11	0.00	12.9
27/09/2023 17:57	0.0	10.8	0.0	0	0	1001	-1.33	0.00	12.9
27/09/2023 18:57	0.0	10.7	0.0	0	0	999	-1.40	0.00	13.1
27/09/2023 19:57	0.0	11.0	0.0	0	0	998	-1.36	0.00	13.1
27/09/2023 20:57	0.0	11.0	0.0	0	0	997	-1.32	0.01	13.2
27/09/2023 21:57	0.1	11.0	0.0	0	0	996	-1.17	0.00	13.3
27/09/2023 22:57	0.0	11.1	0.0	0	0	996	-1.10	0.00	13.3
27/09/2023 23:57	0.0	10.9	0.0	0	0	997	-0.81	0.00	13.3
28/09/2023 00:57	0.0	10.4	0.0	0	0	997	-0.47	0.00	13.2
28/09/2023 01:57	0.0	10.1	0.0	0	0	997	-0.25	0.00	13.1
28/09/2023 02:57	0.0	9.4	1.9	0	0	999	0.08	0.00	13.1
28/09/2023 03:57	0.0	8.7	4.9	0	0	999	0.27	0.00	13.1
28/09/2023 04:57	0.0	8.2	7.2	0	0	1000	0.49	0.00	13.1
28/09/2023 05:57	0.0	7.5	8.9	0	0	1001	0.68	0.00	13.0
28/09/2023 06:57	0.0	7.2	10.3	0	0	1003	0.74	0.00	12.9
28/09/2023 07:57	0.0	6.4	10.6	0	0	1003	0.81	0.00	12.9
28/09/2023 08:57	0.0	6.2	11.0	0	0	1004	0.85	0.00	12.8
28/09/2023 09:57	0.0	3.6	11.0	0	0	1005	0.82	0.00	12.8
28/09/2023 10:57	0.0	3.8	11.2	0	0	1006	0.83	0.00	12.8
28/09/2023 11:57	0.0	4.8	11.8	0	0	1006	0.70	0.00	12.8
28/09/2023 12:57	0.0	5.0	12.1	0	0	1006	0.62	0.00	12.8
28/09/2023 13:57	0.0	5.6	12.3	0	0	1006	0.49	0.00	12.9
28/09/2023 14:57	0.0	6.0	12.2	0	0	1006	0.39	0.00	13.1
28/09/2023 15:57	0.0	6.2	12.1	0	0	1006	0.29	0.00	13.3
28/09/2023 16:57	0.0	6.4	11.7	0	0	1006	0.10	0.00	13.3
28/09/2023 17:57	0.0	6.6	11.3	0	0	1005	-0.11	0.00	13.3
28/09/2023 18:57	0.0	6.8	10.5	0	0	1005	-0.17	0.00	13.3
28/09/2023 19:57	0.0	7.0	9.6	0	0	1005	-0.24	0.00	13.2
28/09/2023 20:57	0.0	7.4	8.7	0	0	1004	-0.28	0.00	13.1
28/09/2023 21:57	0.0	7.7	7.9	0	0	1004	-0.27	0.00	13.0
28/09/2023 22:57	0.0	7.8	7.0	0	0	1004	-0.32	0.00	12.9
28/09/2023 23:57	0.0	8.1	6.0	0	0	1003	-0.32	0.00	12.9
29/09/2023 00:57	0.0	8.2	5.3	0	0	1003	-0.22	0.00	12.8
29/09/2023 01:57	0.0	8.3	4.9	0	0	1003	-0.15	0.00	12.8
29/09/2023 02:57	0.0	8.1	5.0	0	0	1004	-0.11	0.00	12.7
29/09/2023 03:57	0.0	6.4	6.6	0	0	1004	-0.04	0.00	12.6
29/09/2023 04:57	0.0	5.3	7.8	0	0	1005	0.06	0.00	12.5
29/09/2023 05:57	0.0	4.8	8.7	0	0	1005	0.18	0.00	12.4
29/09/2023 06:58	0.0	3.1	10.5	0	0	1006	0.33	0.00	12.3
29/09/2023 07:58	0.0	1.7	12.4	0	0	1007	0.47	0.01	12.1
29/09/2023 08:58	0.0	2.4	12.8	0	0	1008	0.61	0.00	11.9

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
29/09/2023 09:58	0.0	3.3	13.0	0	0	1010	0.78	0.01	11.9
29/09/2023 10:57	0.0	4.5	13.4	0	0	1011	0.84	0.00	12.1
29/09/2023 11:57	0.0	4.9	13.8	0	0	1011	0.81	0.00	12.3
29/09/2023 12:57	0.0	4.9	14.2	0	0	1012	0.85	0.00	12.6
29/09/2023 13:57	0.0	4.8	14.6	0	0	1013	0.85	0.00	12.8
29/09/2023 14:57	0.0	4.6	14.9	0	0	1013	0.81	0.00	13.1
29/09/2023 15:57	0.0	4.5	15.1	0	0	1014	0.69	0.00	13.4
29/09/2023 16:57	0.0	4.5	15.2	0	0	1014	0.57	0.00	13.6
29/09/2023 17:57	0.0	4.5	15.3	0	0	1015	0.53	0.00	13.8
29/09/2023 18:57	0.0	3.7	15.6	0	0	1016	0.56	0.00	13.9
29/09/2023 19:57	0.0	2.3	16.0	0	0	1016	0.51	0.00	13.7
29/09/2023 20:57	0.0	2.1	16.2	0	0	1017	0.49	0.00	13.4
29/09/2023 21:57	0.0	1.3	16.5	0	0	1017	0.48	0.00	13.2
29/09/2023 22:57	0.0	1.2	16.6	0	0	1018	0.46	0.00	12.9
29/09/2023 23:57	0.0	0.5	17.0	0	0	1018	0.40	0.00	12.7
30/09/2023 00:57	0.0	0.8	16.9	0	0	1019	0.46	0.00	12.4
30/09/2023 01:57	0.0	1.1	16.8	0	0	1018	0.33	0.00	12.3
30/09/2023 02:58	0.0	1.5	16.5	0	0	1019	0.29	0.00	12.1
30/09/2023 03:58	0.0	1.6	16.4	0	0	1018	0.18	0.00	11.9
30/09/2023 04:57	0.0	1.5	16.4	0	0	1018	0.13	0.00	11.8
30/09/2023 05:57	0.0	1.5	16.4	0	0	1019	0.13	0.00	11.6
30/09/2023 06:57	0.0	1.2	16.6	0	0	1019	0.11	0.00	11.4
30/09/2023 07:57	0.0	1.2	16.6	0	0	1019	0.05	0.00	11.2
30/09/2023 08:57	0.0	0.9	16.9	0	0	1020	0.16	0.00	11.1
30/09/2023 09:58	0.0	1.5	16.5	0	0	1020	0.20	0.00	11.1
30/09/2023 10:58	0.0	1.9	16.1	0	0	1020	0.19	0.00	11.3
30/09/2023 11:57	0.0	2.7	15.6	0	0	1020	0.19	0.00	11.6
30/09/2023 12:57	0.0	3.6	14.9	0	0	1019	0.08	0.00	11.9
30/09/2023 13:57	0.0	4.1	14.3	0	0	1018	-0.02	0.00	12.2
30/09/2023 14:57	0.0	4.5	13.7	0	0	1018	-0.10	0.00	12.4
30/09/2023 15:57	0.0	4.8	13.1	0	0	1018	-0.25	0.00	12.4
30/09/2023 16:57	0.0	5.2	12.2	0	0	1017	-0.38	0.00	12.5
30/09/2023 17:57	0.0	5.4	11.3	0	0	1017	-0.40	0.00	12.4
30/09/2023 18:57	0.0	5.8	10.3	0	0	1016	-0.44	0.00	12.3
30/09/2023 19:58	0.0	6.2	9.0	0	0	1015	-0.46	0.00	12.1
30/09/2023 20:58	0.0	6.6	7.5	0	0	1015	-0.42	0.00	12.0
30/09/2023 21:58	0.0	7.1	5.7	0	0	1014	-0.49	0.00	11.9
30/09/2023 22:58	0.0	7.7	3.7	0	0	1013	-0.51	0.00	11.8
30/09/2023 23:58	0.0	8.1	2.1	0	0	1013	-0.54	0.00	11.8
01/10/2023 00:57	0.0	8.5	0.9	0	0	1012	-0.54	0.00	11.8
01/10/2023 01:57	0.0	8.6	0.0	0	0	1012	-0.54	0.00	11.8
01/10/2023 02:58	0.0	8.7	0.0	0	0	1012	-0.48	0.00	11.9
01/10/2023 03:57	0.0	8.9	0.0	0	0	1011	-0.46	0.00	11.9
01/10/2023 04:57	0.0	9.3	0.0	0	0	1011	-0.38	0.00	12.0
01/10/2023 05:57	0.0	9.0	0.0	0	0	1011	-0.27	0.00	12.1
01/10/2023 06:57	0.0	8.5	0.0	0	0	1011	-0.17	0.00	12.2
01/10/2023 07:57	0.0	8.5	0.0	0	0	1011	-0.10	0.00	12.3
01/10/2023 08:57	0.0	8.3	0.3	0	0	1012	-0.03	0.00	12.4
01/10/2023 09:57	0.0	7.3	1.4	0	0	1012	0.04	0.00	12.4
01/10/2023 10:57	0.0	5.0	3.9	0	0	1012	0.12	0.00	12.6
01/10/2023 11:57	0.0	4.6	4.8	0	0	1013	0.19	0.00	12.8
01/10/2023 12:57	0.0	5.0	4.6	0	0	1013	0.16	0.00	13.0
01/10/2023 13:57	0.0	6.0	3.9	0	0	1013	0.13	0.00	13.0
01/10/2023 14:57	0.0	6.6	3.2	0	0	1013	0.16	0.00	13.5
01/10/2023 15:57	0.0	7.3	2.5	0	0	1012	0.08	0.00	13.7
01/10/2023 16:58	0.0	7.8	2.0	0	0	1012	0.03	0.00	13.9
01/10/2023 17:57	0.0	7.9	1.7	0	0	1012	-0.04	0.00	14.1
01/10/2023 18:57	0.0	7.2	2.5	0	0	1012	-0.07	0.00	14.3
01/10/2023 19:57	0.0	3.6	5.7	0	0	1012	-0.05	0.00	14.3
01/10/2023 20:57	0.0	1.6	8.4	0	0	1013	0.00	0.00	14.2
01/10/2023 21:57	0.0	1.2	9.5	0	0	1013	0.02	0.00	14.0
01/10/2023 22:57	0.0	1.3	9.3	0	0	1013	0.06	0.00	13.8
01/10/2023 23:57	0.0	2.3	8.3	0	0	1013	0.10	0.00	13.6
02/10/2023 00:57	0.0	3.2	7.2	0	0	1013	0.10	0.00	13.4
02/10/2023 01:57	0.0	3.7	6.5	0	0	1013	0.08	0.00	13.2
02/10/2023 02:57	0.0	4.1	6.0	0	0	1013	0.06	0.00	13.0
02/10/2023 03:57	0.0	5.0	5.1	0	0	1013	0.01	0.00	12.8
02/10/2023 04:58	0.0	6.0	4.2	0	0	1013	-0.03	0.00	12.6
02/10/2023 05:58	0.0	6.4	3.6	0	0	1012	-0.09	0.00	12.4
02/10/2023 06:58	0.0	6.5	3.3	0	0	1012	-0.08	0.00	12.2
02/10/2023 07:58	0.0	5.4	4.5	0	0	1012	-0.05	0.00	12.1
02/10/2023 08:58	0.0	4.0	6.2	0	0	1013	0.00	0.00	11.9
02/10/2023 09:58	0.0	3.7	6.7	0	0	1013	0.06	0.00	11.9
02/10/2023 10:57	0.0	3.1	7.4	0	0	1013	0.08	0.00	11.9
02/10/2023 11:57	0.0	4.6	5.9	0	0	1014	0.16	0.00	12.1
02/10/2023 12:57	0.0	6.1	4.1	0	0	1013	0.11	0.00	12.3
02/10/2023 13:57	0.0	7.2	2.9	0	0	1013	0.04	0.00	12.4
02/10/2023 14:57	0.0	7.8	1.9	0	0	1012	0.00	0.00	12.6
02/10/2023 15:57	0.0	8.6	0.6	0	0	1012	-0.12	0.00	12.8
02/10/2023 16:57	0.0	9.0	0.0	0	0	1011	-0.31	0.00	12.8
02/10/2023 17:57	0.0	9.4	0.0	0	0	1010	-0.38	0.00	12.8
02/10/2023 18:57	0.0	9.8	0.0	0	0	1009	-0.59	0.00	12.8
02/10/2023 19:57	0.0	9.9	0.0	0	0	1009	-0.53	0.00	12.7
02/10/2023 20:57	0.0	10.1	0.0	0	0	1009	-0.45	0.00	12.6
02/10/2023 21:58	0.0	10.1	0.0	0	0	1009	-0.43	0.00	12.4
02/10/2023 22:57	0.0	10.3	0.0	0	0	1008	-0.48	-0.01	12.3
02/10/2023 23:58	0.0	10.3	0.0	0	0	1008	-0.38	0.00	12.2
03/10/2023 00:57	0.0	10.6	0.0	0	0	1007	-0.44	0.00	12.1
03/10/2023 01:58	0.0	10.6	0.0	0	0	1007	-0.28	0.00	11.9
03/10/2023 02:57	0.1	10.6	0.0	0	0	1007	-0.29	0.00	11.8
03/10/2023 03:58	0.0	10.7	0.0	0	0	1006	-0.34	0.00	11.6
03/10/2023 04:58	0.0	10.6	0.0	0	0	1006	-0.36	0.00	11.5
03/10/2023 05:57	0.0	10.7	0.0	0	0	1006	-0.22	0.00	11.3
03/10/2023 06:57	0.0	10.6	0.0	0	0	1006	-0.19	0.00	11.1
03/10/2023 07:57	0.0	8.9	0.0	0	0	1006	-0.05	0.00	10.9
03/10/2023 08:57	0.0	2.8	0.0	0	0	1007	0.06	0.00	10.9
03/10/2023 09:58	0.0	1.3	2.8	0	0	1008	0.20	0.00	10.8
03/10/2023 10:57	0.0	0.9	4.5	0	0	1009	0.38	0.00	10.8
03/10/2023 11:58	0.0	0.9	5.0	0	0	1010	0.52	0.00	11.0
03/10/2023 12:57	0.0	1.1	5.2	0	0	1011	0.55	0.00	11.3
03/10/2023 13:57	0.0	0.5	6.2	0	0	1011	0.58	0.00	11.5
03/10/2023 14:57	0.0	0.4	7.3	0	0	1011	0.62	0.00	11.7
03/10/2023 15:57	0.0	0.3	8.5	0	0	1012	0.57	0.00	11.9
03/10/2023 16:57	0.0	0.2	9.7	0	0	1013	0.55	0.00	12.1
03/10/2023 17:57	0.0	0.2	10.8	0	0	1013	0.50	0.00	12.1
03/10/2023 18:57	0.0	0.2	12.0	0	0	1014	0.48	0.00	12.1
03/10/2023 19:57	0.0	0.0	13.0	0	0	1015	0.54	0.00	12.0
03/10/2023 20:57	0.0	0.0	13.8	0	0	1016	0.63	0.00	11.9
03/10/2023 21:57	0.0	0.0	14.5	0	0	1017	0.67	0.00	11.8
03/10/2023 22:58	0.0	0.0	15.0	0	0	1017	0.65	0.00	11.6
03/10/2023 23:58	0.0	0.0	15.3	0	0	1017	0.60	0.00	11.4
04/10/2023 00:58	0.0	0.0	15.5	0	0	1017	0.49	0.01	11.3
04/10/2023 01:57	0.0	0.0	15.5	0	0	1018	0.45	0.00	11.2
04/10/2023 02:57	0.1	0.3	15.0	0	0	1017	0.30	0.00	11.1
04/10/2023 03:58	0.0	0.7	14.1	0	0	1017	0.18	0.00	11.1
04/10/2023 04:58	0.0	0.8	13.7	0	0	1017	0.07	0.00	11.0
04/10/2023 05:57	0.0	1.3	12.8	0	0	1017	0.00	0.00	10.9
04/10/2023 06:58	0.0	1.9	11.9	0	0	1017	-0.06	0.00	10.9

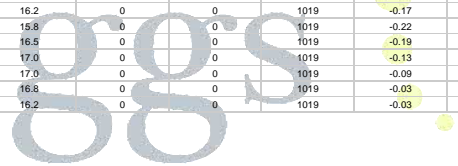


Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
04/10/2023 07:58	0.0	2.4	11.0	0	0	1017	-0.06	0.00	10.8
04/10/2023 08:57	0.0	2.4	10.7	0	0	1017	-0.13	0.00	10.8
04/10/2023 09:57	0.0	2.1	11.1	0	0	1017	-0.06	0.00	10.8
04/10/2023 10:57	0.0	2.8	10.3	0	0	1017	-0.06	0.00	10.8
04/10/2023 11:58	0.0	3.2	9.6	0	0	1017	-0.01	0.00	10.8
04/10/2023 12:57	0.0	3.8	8.5	0	0	1017	-0.03	0.00	10.9
04/10/2023 13:57	0.0	4.6	7.1	0	0	1016	-0.05	0.00	11.1
04/10/2023 14:57	0.0	5.0	5.9	0	0	1016	-0.13	0.00	11.4
04/10/2023 15:57	0.0	5.6	4.7	0	0	1016	-0.12	0.00	11.7
04/10/2023 16:57	0.0	6.0	3.4	0	0	1015	-0.20	0.00	11.9
04/10/2023 17:57	0.0	6.2	2.3	0	0	1015	-0.22	0.00	12.1
04/10/2023 18:57	0.0	6.5	1.6	0	0	1015	-0.28	0.00	12.2
04/10/2023 19:57	0.0	6.1	2.0	0	0	1015	-0.24	0.00	12.2
04/10/2023 20:57	0.0	6.5	1.5	0	0	1015	-0.18	0.00	12.1
04/10/2023 21:57	0.0	6.6	1.1	0	0	1015	-0.13	0.00	12.0
04/10/2023 22:57	0.0	6.5	1.2	0	0	1015	-0.04	0.00	11.9
04/10/2023 23:57	0.0	6.8	0.8	0	0	1015	-0.03	0.00	11.8
05/10/2023 00:57	0.0	7.0	0.3	0	0	1015	0.00	0.00	11.8
05/10/2023 01:57	0.0	7.2	0.0	0	0	1015	0.01	0.00	11.7
05/10/2023 02:57	0.0	6.9	0.4	0	0	1015	0.01	0.00	11.6
05/10/2023 03:58	0.0	6.8	0.6	0	0	1015	0.01	0.00	11.6
05/10/2023 04:57	0.0	6.9	0.5	0	0	1015	0.03	0.00	11.5
05/10/2023 05:58	0.0	5.4	2.2	0	0	1015	-0.03	0.00	11.4
05/10/2023 06:57	0.0	5.0	3.0	0	0	1015	0.02	0.00	11.4
05/10/2023 07:58	0.0	4.6	3.7	0	0	1015	0.03	0.00	11.4
05/10/2023 08:57	0.0	1.7	7.6	0	0	1015	0.08	0.00	11.4
05/10/2023 09:57	0.0	0.8	10.0	0	0	1016	0.14	0.00	11.4
05/10/2023 10:57	0.0	0.7	10.9	0	0	1017	0.18	0.00	11.4
05/10/2023 11:57	0.0	0.7	10.9	0	0	1017	0.24	0.00	11.6
05/10/2023 12:57	0.0	2.1	8.9	0	0	1017	0.21	0.00	11.8
05/10/2023 13:57	0.0	4.8	5.3	0	0	1016	0.11	0.00	11.9
05/10/2023 14:57	0.0	6.1	3.1	0	0	1016	0.04	0.00	11.9
05/10/2023 15:57	0.0	6.9	1.6	0	0	1015	-0.04	0.00	12.1
05/10/2023 16:57	0.0	7.4	0.3	0	0	1014	-0.20	0.00	12.1
05/10/2023 17:57	0.0	7.9	0.0	0	0	1014	-0.31	0.00	12.1
05/10/2023 18:57	0.0	8.3	0.0	0	0	1013	-0.46	0.01	12.1
05/10/2023 19:57	0.0	8.6	0.0	0	0	1013	-0.45	0.01	12.1
05/10/2023 20:57	0.0	9.0	0.0	0	0	1013	-0.43	0.01	12.1
05/10/2023 21:57	0.0	9.1	0.0	0	0	1013	-0.37	0.00	12.1
05/10/2023 22:57	0.1	9.3	0.0	0	0	1013	-0.33	-0.01	12.1
05/10/2023 23:57	0.0	9.3	0.0	0	0	1012	-0.26	0.00	12.1
06/10/2023 00:57	0.0	9.3	0.0	0	0	1013	-0.17	0.00	12.1
06/10/2023 01:57	0.0	9.4	0.0	0	0	1012	-0.14	0.01	12.1
06/10/2023 02:57	0.0	9.7	0.0	0	0	1012	-0.17	0.00	12.1
06/10/2023 03:57	0.0	9.8	0.0	0	0	1011	-0.18	0.00	12.1
06/10/2023 04:57	0.0	9.8	0.0	0	0	1011	-0.17	0.00	12.2
06/10/2023 05:57	0.1	9.9	0.0	0	0	1011	-0.25	0.00	12.2
06/10/2023 06:57	0.0	10.0	0.0	0	0	1011	-0.21	0.00	12.3
06/10/2023 07:57	0.0	9.9	0.0	0	0	1011	-0.22	0.00	12.3
06/10/2023 08:57	0.1	6.1	0.0	0	0	1012	-0.06	0.00	12.4
06/10/2023 09:57	0.0	4.8	0.3	0	0	1012	0.04	0.00	12.4
06/10/2023 10:57	0.0	6.5	0.0	0	0	1012	0.14	0.00	12.5
06/10/2023 11:57	0.0	7.0	0.0	0	0	1012	0.14	0.00	12.6
06/10/2023 12:57	0.1	7.7	0.0	0	0	1013	0.29	0.00	12.8
06/10/2023 13:57	0.0	9.3	0.0	0	0	1013	0.23	0.00	12.9
06/10/2023 14:57	0.0	9.7	0.0	0	0	1012	0.11	0.00	13.0
06/10/2023 15:57	0.0	10.0	0.0	0	0	1012	0.01	0.00	13.1
06/10/2023 16:57	0.0	10.0	0.0	0	0	1011	-0.10	0.00	13.3
06/10/2023 17:57	0.1	7.4	0.0	0	0	1012	-0.04	0.00	13.4
06/10/2023 18:57	0.0	5.2	0.7	0	0	1013	0.03	0.00	13.5
06/10/2023 19:57	0.0	3.2	3.3	0	0	1013	0.03	0.00	13.5
06/10/2023 20:57	0.0	6.0	1.3	0	0	1013	0.10	0.00	13.5
06/10/2023 21:57	0.0	7.8	0.0	0	0	1013	0.14	0.00	13.5
06/10/2023 22:57	0.0	8.2	0.0	0	0	1013	0.18	0.00	13.5
06/10/2023 23:57	0.0	8.6	0.0	0	0	1013	0.25	0.00	13.5
07/10/2023 00:57	0.0	9.0	0.0	0	0	1013	0.16	0.00	13.4
07/10/2023 01:57	0.1	9.4	0.0	0	0	1013	0.05	0.00	13.4
07/10/2023 02:57	0.0	9.4	0.0	0	0	1013	0.01	0.00	13.4
07/10/2023 03:57	0.0	10.0	0.0	0	0	1013	-0.10	0.00	13.3
07/10/2023 04:57	0.0	9.9	0.0	0	0	1013	-0.04	0.00	13.3
07/10/2023 05:57	0.0	10.0	0.0	0	0	1013	-0.03	0.00	13.1
07/10/2023 06:57	0.0	10.2	0.0	0	0	1013	-0.09	0.00	13.1
07/10/2023 07:57	0.0	5.6	0.5	0	0	1012	-0.12	0.00	12.9
07/10/2023 08:57	0.0	4.1	2.8	0	0	1013	0.04	0.00	12.9
07/10/2023 09:57	0.0	3.6	3.8	0	0	1014	0.05	0.00	12.8
07/10/2023 10:57	0.1	2.1	5.5	0	0	1014	0.19	0.00	12.8
07/10/2023 11:57	0.1	2.7	5.3	0	0	1014	0.17	0.00	12.8
07/10/2023 12:57	0.0	2.3	5.6	0	0	1014	0.17	0.00	12.8
07/10/2023 13:57	0.0	3.7	4.3	0	0	1014	0.20	0.00	12.9
07/10/2023 14:57	0.0	5.8	2.2	0	0	1015	0.30	0.00	13.0
07/10/2023 15:57	0.0	6.9	0.8	0	0	1015	0.18	0.00	13.3
07/10/2023 16:58	0.1	5.2	2.5	0	0	1015	0.16	0.00	13.7
07/10/2023 17:58	0.0	4.1	3.8	0	0	1015	0.14	0.00	14.0
07/10/2023 18:58	0.1	1.5	7.3	0	0	1015	0.15	0.00	14.2
07/10/2023 19:57	0.0	0.4	9.8	1	0	1016	0.18	0.00	14.2
07/10/2023 20:57	0.0	0.3	11.3	2	0	1016	0.23	0.00	14.1
07/10/2023 21:57	0.1	0.2	12.1	1	0	1017	0.23	0.00	13.9
07/10/2023 22:57	0.0	0.2	13.1	0	0	1017	0.28	0.00	13.8
07/10/2023 23:57	0.1	0.2	13.8	1	0	1018	0.41	0.00	13.7
08/10/2023 00:57	0.1	0.0	14.3	0	0	1018	0.36	0.00	13.6
08/10/2023 01:57	0.1	0.0	15.0	0	0	1019	0.47	0.00	13.4
08/10/2023 02:57	0.1	0.0	15.4	0	0	1020	0.49	0.00	13.3
08/10/2023 03:57	0.1	0.2	15.4	0	0	1020	0.43	0.00	13.1
08/10/2023 04:57	0.1	0.0	15.7	0	0	1020	0.37	0.00	13.0
08/10/2023 05:57	0.1	0.2	15.6	0	0	1020	0.34	0.00	12.9
08/10/2023 06:57	0.1	0.7	14.8	0	0	1020	0.21	0.00	12.8
08/10/2023 07:57	0.1	1.2	13.8	0	0	1019	0.17	0.00	12.7
08/10/2023 08:57	0.1	1.3	13.5	0	0	1019	0.06	0.00	12.6
08/10/2023 09:57	0.1	0.8	14.2	0	0	1020	0.00	0.00	12.6
08/10/2023 10:57	0.1	0.7	14.5	0	0	1020	0.04	0.00	12.6
08/10/2023 11:57	0.0	1.6	13.4	0	0	1020	0.01	0.00	12.7
08/10/2023 12:57	0.1	3.1	11.6	0	0	1020	-0.03	0.00	12.9
08/10/2023 13:57	0.1	4.2	9.7	0	0	1019	-0.06	0.00	13.1
08/10/2023 14:57	0.0	5.0	7.8	0	0	1018	-0.16	0.00	13.4
08/10/2023 15:57	0.1	6.1	5.1	0	0	1018	-0.17	0.00	13.7
08/10/2023 16:58	0.0	6.6	2.9	0	0	1017	-0.35	0.00	13.9
08/10/2023 17:57	0.1	7.2	1.1	0	0	1016	-0.44	0.00	14.1
08/10/2023 18:57	0.0	7.4	0.2	0	0	1016	-0.44	0.00	14.1
08/10/2023 19:57	0.0	7.8	0.0	0	0	1016	-0.44	0.00	14.1
08/10/2023 20:57	0.0	7.8	0.0	0	0	1016	-0.42	0.00	14.1
08/10/2023 21:57	0.0	8.1	0.0	0	0	1016	-0.28	0.00	13.9
08/10/2023 22:57	0.0	8.2	0.0	0	0	1016	-0.27	0.00	13.9
08/10/2023 23:57	0.0	8.5	0.0	0	0	1016	-0.14	0.00	13.8
09/10/2023 00:57	0.0	8.6	0.0	0	0	1015	-0.16	0.00	13.8
09/10/2023 01:57	0.0	8.7	0.0	0	0	1015	-0.15	0.00	13.7
09/10/2023 02:57	0.0	8.9	0.0	0	0	1015	-0.15	0.00	13.6
09/10/2023 03:57	0.0	9.1	0.0	0	0	1015	-0.15	0.00	13.6
09/10/2023 04:57	0.1	9.1	0.0	0	0	1014	-0.18	0.00	13.5

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
09/10/2023 05:57	0.1	6.2	0.3	0	0	1015	-0.10	0.00	13.5
09/10/2023 06:57	0.1	7.0	0.2	0	0	1015	-0.03	0.00	13.4
09/10/2023 07:57	0.1	7.4	0.0	0	0	1015	0.04	0.00	13.4
09/10/2023 08:57	0.1	4.0	3.4	0	0	1016	0.07	0.00	13.4
09/10/2023 09:57	0.1	3.2	5.2	0	0	1016	0.15	0.00	13.4
09/10/2023 10:57	0.1	4.5	4.1	0	0	1017	0.22	0.00	13.4
09/10/2023 11:57	0.0	3.8	4.5	0	0	1017	0.31	0.00	13.7
09/10/2023 12:57	0.0	4.6	3.7	0	0	1017	0.31	0.00	14.1
09/10/2023 13:58	0.0	6.8	1.5	0	0	1017	0.21	0.00	14.4
09/10/2023 14:58	0.0	7.9	0.0	0	0	1016	0.13	0.00	14.8
09/10/2023 15:57	0.0	8.6	0.0	0	0	1016	0.05	0.00	15.1
09/10/2023 16:57	0.0	9.0	0.0	0	0	1016	-0.06	0.00	15.4
09/10/2023 17:58	0.0	9.1	0.0	0	0	1015	-0.18	0.00	15.6
09/10/2023 18:58	0.0	9.3	0.0	0	0	1015	-0.26	0.00	15.6
09/10/2023 19:57	0.0	9.3	0.0	0	0	1015	-0.33	0.00	15.4
09/10/2023 20:58	0.1	9.4	0.0	0	0	1015	-0.29	0.00	15.1
09/10/2023 21:57	0.1	9.7	0.0	0	0	1014	-0.28	0.00	14.9
09/10/2023 22:57	0.1	9.8	0.0	0	0	1014	-0.23	-0.01	14.7
09/10/2023 23:57	0.1	10.1	0.0	0	0	1014	-0.22	0.00	14.4
10/10/2023 00:57	0.1	10.1	0.0	0	0	1013	-0.25	0.01	14.3
10/10/2023 01:57	0.1	10.2	0.0	0	0	1013	-0.28	0.00	14.1
10/10/2023 02:57	0.1	10.5	0.0	0	0	1012	-0.33	0.00	13.9
10/10/2023 03:57	0.1	10.6	0.0	0	0	1012	-0.36	0.00	13.8
10/10/2023 04:57	0.1	10.6	0.0	0	0	1012	-0.34	0.00	13.7
10/10/2023 05:57	0.1	10.7	0.0	0	0	1011	-0.44	0.00	13.6
10/10/2023 06:57	0.1	10.7	0.0	0	0	1011	-0.42	0.00	13.4
10/10/2023 07:57	0.1	10.9	0.0	0	0	1010	-0.43	0.00	13.4
10/10/2023 08:57	0.1	10.7	0.0	0	0	1010	-0.40	0.00	13.3
10/10/2023 09:57	0.1	10.8	0.0	0	0	1010	-0.29	0.00	13.3
10/10/2023 10:57	0.1	10.9	0.0	0	0	1010	-0.27	0.00	13.3
10/10/2023 11:57	0.1	11.0	0.0	0	0	1009	-0.29	0.00	13.4
10/10/2023 12:57	0.1	10.7	0.0	0	0	1009	-0.22	0.00	13.7
10/10/2023 13:58	0.1	10.9	0.0	0	0	1008	-0.26	0.00	14.0
10/10/2023 14:58	0.1	11.0	0.0	0	0	1008	-0.26	0.00	14.3
10/10/2023 15:58	0.1	11.0	0.0	0	0	1007	-0.30	0.00	14.6
10/10/2023 16:58	0.1	10.7	0.0	0	0	1006	-0.45	0.00	14.8
10/10/2023 17:57	0.1	10.9	0.0	0	0	1006	-0.51	0.00	14.9
10/10/2023 18:58	0.1	10.8	0.0	0	0	1005	-0.53	0.00	14.8
10/10/2023 19:57	0.1	11.0	0.0	0	0	1005	-0.53	0.00	14.7
10/10/2023 20:57	0.1	11.0	0.0	0	0	1004	-0.50	0.00	14.6
10/10/2023 21:57	0.1	11.0	0.0	0	0	1005	-0.38	0.00	14.4
10/10/2023 22:57	0.1	11.1	0.0	0	0	1004	-0.39	0.00	14.3
10/10/2023 23:57	0.1	11.2	0.0	0	0	1004	-0.30	0.00	14.2
11/10/2023 00:57	0.2	11.1	0.0	0	0	1004	-0.24	0.00	14.1
11/10/2023 01:57	0.1	11.1	0.0	0	0	1003	-0.27	0.00	14.1
11/10/2023 02:57	0.1	11.1	0.0	0	0	1003	-0.21	0.00	14.0
11/10/2023 03:57	0.2	11.0	0.0	0	0	1003	-0.21	0.00	14.0
11/10/2023 04:57	0.1	11.0	0.0	0	0	1003	-0.23	0.00	13.9
11/10/2023 05:57	0.2	11.0	0.0	0	0	1002	-0.30	0.00	13.9
11/10/2023 06:57	0.1	11.1	0.0	0	0	1002	-0.24	0.00	13.8
11/10/2023 07:57	0.1	11.1	0.0	0	0	1002	-0.24	0.00	13.7
11/10/2023 08:57	0.1	10.3	0.0	0	0	1002	-0.09	0.00	13.6
11/10/2023 09:57	0.1	4.9	2.1	0	0	1003	0.00	0.00	13.6
11/10/2023 10:57	0.1	3.3	5.9	0	0	1004	0.17	0.00	13.4
11/10/2023 11:57	0.1	3.1	7.0	0	0	1005	0.23	0.00	13.4
11/10/2023 12:57	0.1	3.8	5.9	0	0	1005	0.43	0.00	13.3
11/10/2023 13:57	0.1	5.6	3.6	0	0	1005	0.36	0.00	13.2
11/10/2023 14:57	0.1	7.5	1.1	0	0	1005	0.36	0.00	13.1
11/10/2023 15:57	0.1	7.8	0.0	0	0	1005	0.36	0.00	12.9
11/10/2023 16:57	0.1	8.2	0.0	0	0	1005	0.26	0.00	12.8
11/10/2023 17:57	0.1	8.7	0.0	0	0	1005	0.13	0.00	12.6
11/10/2023 18:58	0.1	5.7	2.1	0	0	1006	0.13	0.00	12.5
11/10/2023 19:58	0.1	3.1	6.0	0	0	1006	0.11	0.00	12.3
11/10/2023 20:58	0.1	1.3	9.2	0	0	1007	0.23	0.01	12.2
11/10/2023 21:58	0.1	1.1	10.6	0	0	1007	0.32	0.03	12.1
11/10/2023 22:57	0.1	1.1	10.9	0	0	1007	0.31	0.00	11.9
11/10/2023 23:57	0.1	1.5	10.4	0	0	1008	0.36	0.00	11.6
12/10/2023 00:57	0.1	2.7	8.9	0	0	1008	0.30	0.00	11.3
12/10/2023 01:57	0.1	3.1	8.0	0	0	1008	0.26	0.00	11.1
12/10/2023 02:57	0.1	2.8	8.2	0	0	1008	0.25	0.00	10.8
12/10/2023 03:57	0.1	2.4	8.8	0	0	1008	0.17	0.00	10.5
12/10/2023 04:57	0.1	2.5	8.9	0	0	1008	0.11	0.00	10.2
12/10/2023 05:57	0.1	3.4	7.9	0	0	1008	0.11	0.00	9.9
12/10/2023 06:57	0.1	3.2	8.0	0	0	1008	0.05	0.00	9.8
12/10/2023 07:57	0.1	2.0	9.3	0	0	1009	0.14	0.00	9.5
12/10/2023 08:57	0.1	1.6	10.2	0	0	1009	0.15	0.00	9.3
12/10/2023 09:57	0.1	2.3	9.7	0	0	1010	0.24	0.00	9.2
12/10/2023 10:57	0.1	3.1	8.8	0	0	1010	0.27	0.00	9.4
12/10/2023 11:57	0.1	4.5	7.3	0	0	1010	0.25	0.00	9.8
12/10/2023 12:57	0.1	6.6	5.1	0	0	1010	0.18	-0.01	10.3
12/10/2023 13:57	0.1	7.7	3.1	0	0	1009	0.09	0.00	10.8
12/10/2023 14:57	0.1	8.3	1.4	0	0	1008	-0.06	0.00	11.3
12/10/2023 15:57	0.1	8.9	0.0	0	0	1007	-0.19	0.00	11.7
12/10/2023 16:57	0.1	9.5	0.0	0	0	1007	-0.40	0.00	12.0
12/10/2023 17:57	0.1	9.8	0.0	0	0	1006	-0.50	0.00	12.1
12/10/2023 18:57	0.1	10.0	0.0	0	0	1006	-0.53	0.00	12.0
12/10/2023 19:57	0.1	10.1	0.0	0	0	1006	-0.48	0.00	11.7
12/10/2023 20:57	0.1	10.3	0.0	0	0	1005	-0.45	-0.01	11.4
12/10/2023 21:58	0.1	10.6	0.0	0	0	1004	-0.48	-0.02	11.1
12/10/2023 22:57	0.1	10.7	0.0	0	0	1004	-0.46	0.00	10.9
12/10/2023 23:57	0.1	10.8	0.0	0	0	1003	-0.52	-0.01	10.8
13/10/2023 00:57	0.2	10.9	0.0	0	0	1001	-0.61	-0.01	10.7
13/10/2023 01:57	0.2	11.0	0.0	0	0	1000	-0.70	0.00	10.6
13/10/2023 02:57	0.2	10.8	0.0	0	0	999	-0.88	0.00	10.6
13/10/2023 03:57	0.2	11.0	0.0	0	0	997	-0.98	-0.01	10.6
13/10/2023 04:58	0.2	11.0	0.0	0	0	996	-1.10	0.00	10.6
13/10/2023 05:57	0.2	10.9	0.0	0	0	994	-1.26	0.00	10.6
13/10/2023 06:58	0.3	10.8	0.0	0	0	992	-1.31	-0.01	10.6
13/10/2023 07:57	0.3	10.7	0.0	0	0	991	-1.24	-0.01	10.6
13/10/2023 08:58	0.3	10.8	0.0	0	0	991	-1.21	0.00	10.6
13/10/2023 09:57	0.3	10.8	0.0	0	0	991	-0.99	0.00	10.6
13/10/2023 10:58	0.2	10.8	0.0	0	0	991	-0.85	0.00	10.6
13/10/2023 11:57	0.3	10.8	0.0	0	0	992	-0.49	0.00	10.8
13/10/2023 12:58	0.2	11.0	0.0	0	0	992	-0.22	0.00	10.9
13/10/2023 13:58	0.2	10.8	0.0	0	0	992	0.04	0.00	11.0
13/10/2023 14:58	0.2	10.8	0.0	0	0	993	0.21	0.00	11.1
13/10/2023 15:57	0.2	10.8	0.0	0	0	993	0.31	0.00	11.1
13/10/2023 16:57	0.1	10.8	0.0	0	0	993	0.28	0.00	11.1
13/10/2023 17:58	0.2	10.3	0.0	0	0	994	0.40	0.00	11.1
13/10/2023 18:57	0.1	8.1	0.0	0	0	994	0.30	0.00	10.9
13/10/2023 19:58	0.2	4.6	0.0	0	0	995	0.38	0.00	10.8
13/10/2023 20:57	0.2	3.7	1.2	0	0	996	0.44	0.00	10.5
13/10/2023 21:57	0.2	2.8	3.5	0	0	997	0.45	0.00	10.3
13/10/2023 22:57	0.1	2.3	5.7	0	0	998	0.62	0.00	10.1
13/10/2023 23:57	0.1	1.9	7.3	0	0	999	0.72	0.00	9.8
14/10/2023 00:57	0.1	1.5	8.7	0	0	1000	0.72	0.00	9.6
14/10/2023 01:57	0.2	1.1	10.1	0	0	1001	0.84	0.00	9.4
14/10/2023 02:57	0.2	0.9	11.4	0	0	1002	0.88	0.00	9.2



Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
14/10/2023 03:57	0.1	0.7	12.3	0	0	1003	0.86	0.00	9.0
14/10/2023 04:57	0.1	0.5	13.1	0	0	1003	0.84	0.00	8.8
14/10/2023 05:57	0.1	0.4	13.9	0	0	1004	0.80	0.00	8.6
14/10/2023 06:57	0.1	0.4	14.6	0	0	1005	0.76	0.00	8.4
14/10/2023 07:57	0.2	0.3	15.3	0	0	1006	0.84	0.00	8.2
14/10/2023 08:57	0.1	0.3	15.8	0	0	1008	0.87	0.00	8.1
14/10/2023 09:57	0.2	0.2	16.3	0	0	1009	0.93	0.00	8.0
14/10/2023 10:57	0.1	0.2	16.7	0	0	1011	0.99	0.00	8.2
14/10/2023 11:57	0.1	0.2	17.0	0	0	1011	1.02	0.00	8.4
14/10/2023 12:57	0.2	0.2	17.2	0	0	1012	0.95	0.00	8.7
14/10/2023 13:58	0.1	0.2	17.5	0	0	1012	0.85	0.00	9.0
14/10/2023 14:58	0.1	0.2	17.7	0	0	1012	0.76	0.00	9.3
14/10/2023 15:57	0.1	0.2	17.9	0	0	1013	0.62	0.00	9.4
14/10/2023 16:58	0.1	0.2	18.0	0	0	1013	0.42	0.00	9.6
14/10/2023 17:57	0.1	0.1	18.1	0	0	1013	0.27	0.00	9.6
14/10/2023 18:57	0.1	0.2	18.2	0	0	1013	0.22	0.00	9.5
14/10/2023 19:57	0.1	0.0	18.4	0	0	1014	0.22	0.00	9.3
14/10/2023 20:57	0.1	0.0	18.5	0	0	1015	0.32	0.00	8.9
14/10/2023 21:57	0.1	0.0	18.6	0	0	1015	0.34	0.00	8.6
14/10/2023 22:57	0.1	0.0	18.7	0	0	1016	0.39	0.00	8.3
14/10/2023 23:57	0.1	0.0	18.8	0	0	1016	0.45	0.00	8.0
15/10/2023 00:57	0.2	0.0	18.8	0	0	1017	0.49	0.00	7.7
15/10/2023 01:57	0.1	0.0	18.9	0	0	1017	0.51	0.00	7.4
15/10/2023 02:57	0.1	0.0	18.9	0	0	1018	0.52	0.00	7.1
15/10/2023 03:57	0.2	0.0	18.9	0	0	1018	0.45	0.00	6.9
15/10/2023 04:57	0.1	0.0	19.0	0	0	1018	0.39	0.00	6.6
15/10/2023 05:57	0.2	0.0	19.0	0	0	1019	0.38	0.00	6.4
15/10/2023 06:57	0.2	0.0	19.0	0	0	1020	0.41	0.00	6.2
15/10/2023 07:57	0.2	0.0	19.0	0	0	1020	0.35	0.00	6.0
15/10/2023 08:57	0.2	0.0	19.1	0	0	1020	0.35	0.00	5.8
15/10/2023 09:57	0.1	0.0	19.1	0	0	1021	0.43	0.00	5.8
15/10/2023 10:57	0.1	0.0	19.1	0	0	1022	0.45	0.00	6.0
15/10/2023 11:57	0.2	0.0	19.1	0	0	1022	0.49	0.00	6.3
15/10/2023 12:57	0.2	0.0	19.1	0	0	1022	0.42	0.00	6.7
15/10/2023 13:57	0.2	0.1	19.0	0	0	1022	0.31	0.00	7.1
15/10/2023 14:57	0.2	0.1	18.9	0	0	1021	0.24	0.00	7.6
15/10/2023 15:57	0.1	0.3	18.7	0	0	1021	0.13	0.00	8.1
15/10/2023 16:58	0.1	0.4	18.5	0	0	1021	-0.06	0.00	8.4
15/10/2023 17:58	0.2	0.2	18.8	0	0	1021	-0.13	0.00	8.6
15/10/2023 18:57	0.2	0.1	19.0	0	0	1021	-0.17	0.00	8.7
15/10/2023 19:57	0.1	0.0	19.2	0	0	1021	-0.19	0.00	8.5
15/10/2023 20:57	0.2	0.1	19.1	0	0	1021	-0.17	0.00	8.3
15/10/2023 21:57	0.2	0.1	19.1	0	0	1021	-0.09	0.00	7.9
15/10/2023 22:57	0.1	0.2	19.1	0	0	1021	-0.05	0.00	7.7
15/10/2023 23:57	0.1	0.2	19.0	0	0	1020	-0.05	0.00	7.4
16/10/2023 00:57	0.2	0.1	18.9	0	0	1020	-0.03	0.00	7.2
16/10/2023 01:57	0.1	0.2	18.8	0	0	1020	-0.05	0.00	6.9
16/10/2023 02:57	0.1	0.4	18.4	0	0	1020	-0.09	0.00	6.8
16/10/2023 03:57	0.2	0.8	17.9	0	0	1020	-0.08	0.00	6.6
16/10/2023 04:57	0.1	1.1	17.4	0	0	1020	-0.14	0.00	6.4
16/10/2023 05:57	0.2	1.5	16.9	0	0	1019	-0.17	0.00	6.2
16/10/2023 06:57	0.1	2.0	16.2	0	0	1019	-0.17	0.00	6.0
16/10/2023 07:57	0.2	2.1	15.8	0	0	1019	-0.22	0.00	5.8
16/10/2023 08:57	0.1	1.3	16.5	0	0	1019	-0.19	0.00	5.7
16/10/2023 09:57	0.2	1.1	17.0	0	0	1019	-0.13	0.00	5.6
16/10/2023 10:57	0.1	1.1	17.0	0	0	1019	-0.09	0.00	5.7
16/10/2023 11:57	0.2	1.3	16.8	0	0	1019	-0.03	0.00	5.9
16/10/2023 12:57	0.2	1.7	16.2	0	0	1019	-0.03	0.00	6.3



Experts in Continuous Monitoring

Time Series Data



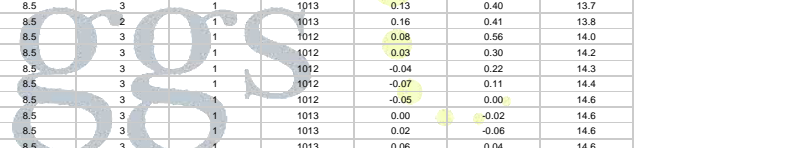
Project Ref:	GGS3070
Project Name:	Skelton Grange, Phase 2
Borehole ref:	MW2A-05
Instrument Name and ID:	GC339/06/12
Start Date:	25/09/2023 12:05
End Date:	16/10/2023 12:06
Days of monitoring:	21
Monitoring Frequency (mins):	60
Total samples taken:	505

Summary Table

	CH ₄	CO ₂	O ₂	CO	H ₂ S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Flow	Temperature
Minimum	0.0	1.7	3.0	0	0	991	-1.40	-1.79	7.8
Maximum	0.2	13.7	18.5	3	1	1022	1.02	6.56	18.4
Range	0.2	12.0	15.5	3	1	32	2.41	8.35	10.6

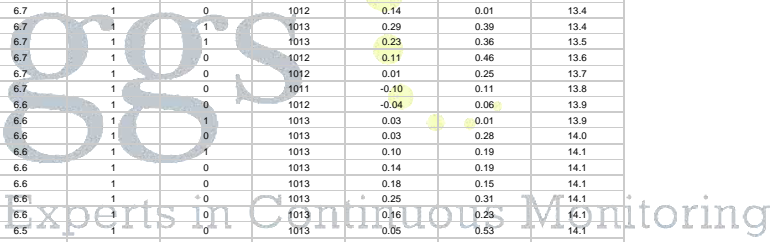
Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
25/09/2023 12:05	0.1	1.7	18.5	0	0	1011	N/A	-0.02	18.4
25/09/2023 13:06	0.0	2.4	17.9	0	0	1012	N/A	0.00	16.2
25/09/2023 14:05	0.0	3.0	17.2	0	0	1012	N/A	0.00	15.6
25/09/2023 15:06	0.0	3.4	16.8	1	0	1012	N/A	0.00	15.5
25/09/2023 16:05	0.0	3.7	16.5	1	0	1012	N/A	0.00	15.4
25/09/2023 17:06	0.0	4.0	16.2	1	0	1012	N/A	0.00	15.4
25/09/2023 18:05	0.0	4.3	16.0	1	0	1013	N/A	0.00	15.3
25/09/2023 19:06	0.0	4.5	15.8	1	0	1013	N/A	0.00	15.2
25/09/2023 20:05	0.1	4.8	15.6	1	0	1013	0.25	0.00	15.1
25/09/2023 21:06	0.0	5.0	15.5	2	0	1014	0.21	0.00	14.9
25/09/2023 22:05	0.0	5.1	15.3	2	0	1014	0.17	0.00	14.8
25/09/2023 23:06	0.1	5.4	15.2	1	0	1013	0.11	0.00	14.7
26/09/2023 00:05	0.1	5.4	15.0	1	0	1013	0.08	0.00	14.5
26/09/2023 01:06	0.0	5.6	14.9	1	0	1013	-0.01	0.00	14.3
26/09/2023 02:05	0.1	5.9	14.8	1	0	1013	-0.08	0.00	14.1
26/09/2023 03:06	0.1	6.0	14.7	1	0	1012	-0.19	0.00	13.9
26/09/2023 04:05	0.1	5.9	14.6	1	0	1012	-0.24	0.00	13.8
26/09/2023 05:06	0.0	6.2	14.4	1	0	1011	-0.33	0.00	13.6
26/09/2023 06:05	0.0	6.2	14.3	1	0	1010	-0.38	0.00	13.5
26/09/2023 07:06	0.0	6.4	14.2	1	0	1010	-0.38	0.00	13.4
26/09/2023 08:05	0.1	6.4	14.1	1	0	1010	-0.34	0.00	13.3
26/09/2023 09:06	0.0	6.5	13.9	1	0	1010	-0.31	0.00	13.1
26/09/2023 10:05	0.1	6.6	13.8	1	0	1009	-0.32	0.00	13.1
26/09/2023 11:06	0.0	6.6	13.6	0	0	1009	-0.35	0.00	13.1
26/09/2023 12:05	0.0	6.9	13.5	1	0	1008	-0.30	0.00	13.1
26/09/2023 13:06	0.1	7.0	13.3	1	0	1008	-0.28	0.00	13.2
26/09/2023 14:05	0.1	7.1	13.2	1	0	1007	-0.39	0.00	13.4
26/09/2023 15:06	0.0	7.2	13.1	1	0	1007	-0.32	0.00	13.6
26/09/2023 16:05	0.1	7.2	13.0	1	0	1008	-0.31	0.00	13.9
26/09/2023 17:06	0.0	7.3	12.9	1	0	1008	-0.13	0.00	14.1
26/09/2023 18:05	0.1	7.3	12.8	1	0	1009	-0.01	0.00	14.2
26/09/2023 19:06	0.1	7.4	12.8	1	0	1009	0.09	0.00	14.3
26/09/2023 20:06	0.0	7.4	12.8	1	0	1010	0.22	0.00	14.3
26/09/2023 21:05	0.1	7.6	12.8	1	0	1010	0.33	0.00	14.1
26/09/2023 22:06	0.0	7.5	12.8	1	0	1010	0.38	0.00	14.0
26/09/2023 23:05	0.1	7.6	12.7	1	0	1011	0.39	0.00	13.9
27/09/2023 00:06	0.0	7.6	12.7	1	0	1011	0.36	0.00	13.8
27/09/2023 01:05	0.0	7.8	12.7	1	0	1012	0.41	0.00	13.6
27/09/2023 02:06	0.0	7.6	12.7	1	0	1012	0.35	0.00	13.5
27/09/2023 03:05	0.1	7.5	12.7	1	0	1012	0.28	0.00	13.3
27/09/2023 04:06	0.1	7.8	12.6	1	0	1012	0.25	0.00	13.2
27/09/2023 05:05	0.1	7.8	12.6	1	0	1011	-0.11	0.00	13.1
27/09/2023 06:06	0.0	7.5	12.6	2	0	1011	0.09	0.00	13.0
27/09/2023 07:05	0.0	7.8	12.6	1	1	1011	0.04	0.00	12.9
27/09/2023 08:06	0.1	7.8	12.5	1	1	1011	-0.15	0.00	12.8
27/09/2023 09:05	0.0	7.8	12.5	2	1	1012	-0.02	0.00	12.8
27/09/2023 10:06	0.1	7.8	12.5	2	1	1011	-0.08	0.00	12.8
27/09/2023 11:05	0.1	7.8	12.4	1	1	1010	-0.16	0.00	12.8
27/09/2023 12:06	0.1	7.8	12.3	2	1	1009	-0.30	0.00	12.9
27/09/2023 13:05	0.1	7.8	12.2	2	1	1008	-0.46	0.00	13.1
27/09/2023 14:06	0.0	7.8	12.1	2	1	1006	-0.68	0.00	13.3
27/09/2023 15:05	0.0	7.8	12.0	2	1	1005	-0.73	0.00	13.4
27/09/2023 16:06	0.1	7.8	11.9	2	1	1003	-1.11	0.01	13.5
27/09/2023 17:05	0.1	8.0	11.7	2	1	1001	-1.33	0.01	13.6
27/09/2023 18:06	0.1	8.2	11.6	2	1	999	-1.40	0.04	13.6
27/09/2023 19:05	0.1	8.2	11.4	2	1	998	-1.36	0.03	13.8
27/09/2023 20:06	0.1	8.2	11.3	3	1	997	-1.32	0.02	13.8
27/09/2023 21:05	0.1	8.5	11.1	2	1	996	-1.17	0.00	13.9
27/09/2023 22:06	0.1	8.6	11.0	2	1	996	-1.10	0.01	13.9
27/09/2023 23:05	0.0	8.7	10.9	2	1	997	-0.81	0.01	13.9
28/09/2023 00:06	0.1	8.6	10.7	3	1	997	-0.47	0.00	13.9
28/09/2023 01:05	0.1	8.9	10.6	2	1	997	-0.25	0.00	13.9
28/09/2023 02:06	0.1	8.9	10.5	3	1	999	0.08	0.01	13.9
28/09/2023 03:05	0.0	9.1	10.4	2	1	999	0.27	0.00	13.9
28/09/2023 04:06	0.1	9.1	10.3	2	1	1000	0.49	0.00	13.9
28/09/2023 05:05	0.0	9.5	10.3	2	1	1001	0.68	0.00	13.9
28/09/2023 06:06	0.1	9.4	10.2	3	1	1003	0.74	0.00	13.9
28/09/2023 07:05	0.0	9.4	10.2	2	1	1003	0.81	0.00	13.8
28/09/2023 08:06	0.1	9.3	10.2	2	1	1004	0.85	0.00	13.8
28/09/2023 09:05	0.1	9.4	10.2	3	1	1005	0.82	0.00	13.8
28/09/2023 10:06	0.1	9.4	10.2	2	1	1006	0.83	0.00	13.8
28/09/2023 11:06	0.0	9.5	10.2	2	1	1006	0.70	0.00	13.8
28/09/2023 12:05	0.0	9.3	10.1	3	1	1006	0.62	0.00	13.8
28/09/2023 13:06	0.1	9.3	10.1	3	1	1006	0.49	0.00	13.8
28/09/2023 14:05	0.1	9.2	10.1	3	1	1006	0.39	0.00	13.8
28/09/2023 15:06	0.0	9.2	10.1	3	1	1006	0.29	0.00	13.9
28/09/2023 16:05	0.1	9.3	10.1	3	1	1006	0.10	0.00	13.9
28/09/2023 17:06	0.0	9.2	10.1	3	1	1005	-0.11	0.00	14.0
28/09/2023 18:05	0.0	9.2	10.1	3	1	1005	-0.17	0.00	14.0
28/09/2023 19:06	0.1	8.9	10.1	3	1	1005	-0.24	0.00	14.0
28/09/2023 20:05	0.1	9.1	10.0	3	1	1004	-0.28	0.00	13.9
28/09/2023 21:06	0.1	9.2	10.0	3	1	1004	-0.27	0.00	13.9
28/09/2023 22:05	0.0	9.3	9.9	3	1	1004	-0.32	0.00	13.9
28/09/2023 23:06	0.1	9.3	9.9	3	1	1003	-0.32	0.00	13.8
29/09/2023 00:05	0.0	9.2	9.9	3	1	1003	-0.22	0.00	13.8
29/09/2023 01:06	0.1	9.4	9.8	3	1	1003	-0.15	0.00	13.7
29/09/2023 02:05	0.1	9.4	9.8	3	1	1004	-0.11	0.00	13.7
29/09/2023 03:06	0.0	9.5	9.7	3	1	1004	-0.04	0.00	13.6
29/09/2023 04:05	0.1	9.5	9.7	3	1	1005	0.06	0.00	13.6
29/09/2023 05:06	0.1	9.4	9.7	3	1	1005	0.18	0.00	13.6
29/09/2023 06:05	0.0	9.6	9.6	3	1	1006	0.33	0.00	13.5
29/09/2023 07:06	0.1	9.5	9.6	3	1	1007	0.47	0.00	13.4
29/09/2023 08:05	0.0	9.5	9.6	2	1	1008	0.61	0.00	13.3
29/09/2023 09:06	0.1	9.7	9.6	3	1	1010	0.78	0.00	13.2

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
29/09/2023 10:05	0.0	9.5	9.6	2	1	1011	0.84	0.00	13.2
29/09/2023 11:06	0.0	9.6	9.6	3	1	1011	0.81	0.00	13.3
29/09/2023 12:05	0.0	9.7	9.6	3	1	1012	0.85	0.00	13.4
29/09/2023 13:06	0.0	9.5	9.6	3	1	1013	0.85	0.00	13.5
29/09/2023 14:05	0.1	9.5	9.6	3	1	1013	0.81	0.00	13.7
29/09/2023 15:06	0.0	9.3	9.6	3	1	1014	0.69	0.00	13.8
29/09/2023 16:05	0.0	9.5	9.7	3	1	1014	0.57	0.00	14.0
29/09/2023 17:06	0.1	9.5	9.7	3	1	1015	0.53	0.00	14.1
29/09/2023 18:05	0.1	9.5	9.8	3	1	1016	0.56	0.00	14.1
29/09/2023 19:06	0.0	9.3	9.8	3	1	1016	0.51	0.00	14.1
29/09/2023 20:05	0.0	9.5	9.8	3	1	1017	0.49	0.00	14.0
29/09/2023 21:06	0.1	9.4	9.9	3	1	1017	0.48	0.00	13.9
29/09/2023 22:05	0.0	9.4	9.9	3	1	1018	0.46	0.00	13.8
29/09/2023 23:06	0.1	9.3	10.0	3	1	1018	0.40	0.00	13.6
30/09/2023 00:05	0.1	9.5	10.0	3	1	1019	0.46	0.00	13.4
30/09/2023 01:06	0.0	9.4	10.0	2	1	1018	0.33	0.00	13.3
30/09/2023 02:06	0.0	9.6	10.1	3	1	1019	0.29	0.00	13.2
30/09/2023 03:05	0.0	9.4	10.1	2	1	1018	0.18	0.00	13.1
30/09/2023 04:06	0.1	9.3	10.1	3	1	1018	0.13	0.00	13.0
30/09/2023 05:05	0.1	9.3	10.1	2	1	1019	0.13	0.00	12.9
30/09/2023 06:06	0.1	9.4	10.1	2	1	1019	0.11	0.00	12.8
30/09/2023 07:05	0.1	9.3	10.1	2	1	1019	0.05	0.00	12.7
30/09/2023 08:05	0.0	9.3	10.1	2	1	1020	-0.16	0.00	12.6
30/09/2023 09:06	0.0	9.4	10.1	2	1	1020	-0.20	0.00	12.4
30/09/2023 10:05	0.0	9.4	10.1	2	1	1020	-0.19	0.00	12.4
30/09/2023 11:06	0.0	9.2	10.1	2	1	1020	-0.19	0.00	12.4
30/09/2023 12:05	0.0	9.3	10.0	3	1	1019	-0.08	0.00	12.6
30/09/2023 13:06	0.1	9.4	10.0	2	1	1018	-0.02	0.00	12.8
30/09/2023 14:05	0.1	9.2	10.0	3	1	1018	-0.10	0.00	12.9
30/09/2023 15:06	0.0	9.5	10.0	3	1	1018	-0.25	0.00	13.1
30/09/2023 16:05	0.1	9.4	9.9	3	1	1017	-0.38	0.00	13.1
30/09/2023 17:06	0.0	9.3	9.9	3	1	1017	-0.40	0.00	13.2
30/09/2023 18:05	0.0	9.5	9.9	3	1	1016	-0.44	0.00	13.2
30/09/2023 19:06	0.0	9.3	9.9	3	1	1015	-0.46	0.00	13.1
30/09/2023 20:05	0.0	9.3	9.8	2	1	1015	-0.42	0.00	13.1
30/09/2023 21:06	0.1	9.4	9.7	3	1	1014	-0.49	0.00	12.9
30/09/2023 22:05	0.1	9.4	9.7	2	1	1013	-0.51	0.00	12.9
30/09/2023 23:06	0.0	9.5	9.6	3	1	1013	-0.54	0.00	12.8
01/10/2023 00:05	0.1	9.7	9.5	3	1	1012	-0.54	0.00	12.8
01/10/2023 01:06	0.0	9.6	9.4	3	1	1012	-0.54	0.00	12.8
01/10/2023 02:05	0.1	9.6	9.3	2	1	1012	-0.48	0.00	12.8
01/10/2023 03:06	0.0	9.7	9.2	2	1	1011	-0.46	5.90	12.9
01/10/2023 04:05	0.1	9.7	9.1	3	1	1011	-0.38	6.56	12.9
01/10/2023 05:06	0.1	10.0	8.9	2	1	1011	-0.27	5.93	12.9
01/10/2023 06:05	0.1	10.2	8.7	3	1	1011	-0.17	2.38	13.0
01/10/2023 07:06	0.0	9.8	8.5	2	1	1011	-0.10	1.19	13.1
01/10/2023 08:05	0.0	9.6	8.5	2	1	1012	-0.03	0.55	13.1
01/10/2023 09:06	0.0	9.5	8.5	2	1	1012	0.04	0.41	13.3
01/10/2023 10:05	0.0	9.3	8.5	2	1	1012	0.12	0.48	13.3
01/10/2023 11:06	0.0	9.4	8.5	2	1	1013	0.19	0.49	13.4
01/10/2023 12:05	0.1	9.5	8.5	3	1	1013	0.16	0.50	13.5
01/10/2023 13:06	0.1	9.4	8.5	3	1	1013	0.13	0.40	13.7
01/10/2023 14:05	0.1	9.2	8.5	2	1	1013	0.16	0.41	13.8
01/10/2023 15:06	0.0	9.3	8.5	3	1	1012	0.08	0.56	14.0
01/10/2023 16:05	0.0	9.2	8.5	3	1	1012	-0.03	0.30	14.2
01/10/2023 17:06	0.1	9.4	8.5	3	1	1012	-0.04	0.22	14.3
01/10/2023 18:05	0.1	9.3	8.5	3	1	1012	-0.07	0.11	14.4
01/10/2023 19:06	0.0	9.4	8.5	3	1	1012	-0.05	0.00	14.6
01/10/2023 20:05	0.0	9.5	8.5	3	1	1013	0.00	-0.02	14.6
01/10/2023 21:06	0.0	9.4	8.5	3	1	1013	0.02	-0.06	14.6
01/10/2023 22:05	0.1	9.6	8.5	3	1	1013	0.06	0.04	14.6
01/10/2023 23:06	0.0	9.4	8.5	2	1	1013	0.10	0.05	14.4
02/10/2023 00:05	0.0	9.4	8.5	2	1	1013	0.10	0.05	14.3
02/10/2023 01:06	0.1	9.5	8.5	2	1	1013	0.08	0.09	14.2
02/10/2023 02:05	0.1	9.6	8.5	2	1	1013	0.06	0.16	14.1
02/10/2023 03:06	0.0	9.7	8.5	3	1	1013	-0.01	0.21	13.9
02/10/2023 04:05	0.1	9.6	8.5	2	1	1013	-0.03	0.17	13.8
02/10/2023 05:06	0.0	9.4	8.5	2	1	1012	-0.09	0.18	13.7
02/10/2023 06:05	0.1	9.5	8.4	2	1	1012	-0.08	0.09	13.6
02/10/2023 07:06	0.1	9.6	8.4	2	1	1012	-0.05	0.01	13.4
02/10/2023 08:05	0.0	9.6	8.4	2	1	1013	0.00	0.10	13.3
02/10/2023 09:06	0.0	10.0	8.4	2	1	1013	0.06	-0.07	13.2
02/10/2023 10:05	0.0	9.6	8.4	2	1	1013	0.08	0.27	13.1
02/10/2023 11:06	0.1	9.5	8.3	2	1	1014	0.16	0.36	13.1
02/10/2023 12:05	0.1	9.7	8.3	2	1	1013	0.11	0.37	13.2
02/10/2023 13:06	0.0	9.8	8.2	2	1	1013	0.04	0.53	13.3
02/10/2023 14:05	0.1	9.8	8.2	2	1	1012	0.00	0.96	13.4
02/10/2023 15:06	0.1	9.7	8.1	2	1	1012	-0.12	0.87	13.6
02/10/2023 16:05	0.1	9.7	8.1	2	1	1011	-0.31	1.29	13.6
02/10/2023 17:06	0.0	10.0	8.0	2	1	1010	-0.38	1.46	13.7
02/10/2023 18:05	0.1	9.8	8.0	2	1	1009	-0.59	0.76	13.7
02/10/2023 19:06	0.1	10.0	7.9	2	1	1009	-0.53	0.73	13.7
02/10/2023 20:05	0.1	10.0	7.9	2	1	1009	-0.45	1.14	13.7
02/10/2023 21:06	0.1	10.0	7.8	2	1	1009	-0.43	1.13	13.6
02/10/2023 22:05	0.1	10.3	7.8	2	1	1008	-0.48	1.61	13.5
02/10/2023 23:06	0.0	10.2	7.7	2	1	1008	-0.38	1.37	13.4
03/10/2023 00:05	0.0	10.0	7.6	2	1	1007	-0.44	1.43	13.4
03/10/2023 01:06	0.0	10.2	7.6	2	1	1007	-0.28	1.58	13.3
03/10/2023 02:05	0.1	10.4	7.5	2	1	1007	-0.29	1.44	13.2
03/10/2023 03:06	0.1	10.4	7.5	2	1	1006	-0.34	1.07	13.1
03/10/2023 04:05	0.0	10.5	7.4	2	1	1006	-0.36	0.84	13.0
03/10/2023 05:06	0.1	10.6	7.4	2	1	1006	-0.22	0.62	12.9
03/10/2023 06:05	0.0	10.5	7.3	2	1	1006	-0.19	0.20	12.8
03/10/2023 07:06	0.0	10.5	7.3	2	1	1006	-0.05	0.00	12.6
03/10/2023 08:05	0.0	10.6	7.3	2	1	1007	0.06	-0.27	12.5
03/10/2023 09:06	0.1	10.3	7.3	2	1	1008	0.20	-0.25	12.4
03/10/2023 10:05	0.1	10.5	7.3	2	1	1009	0.38	-0.24	12.4
03/10/2023 11:06	0.0	10.5	7.4	2	1	1010	0.52	-0.34	12.3
03/10/2023 12:05	0.0	10.5	7.4	2	1	1011	0.55	-0.49	12.4
03/10/2023 13:06	0.0	10.4	7.4	2	1	1011	0.58	-0.57	12.6
03/10/2023 14:05	0.0	10.2	7.5	2	1	1011	0.62	-0.81	12.8
03/10/2023 15:06	0.1	10.2	7.6	2	1	1012	0.57	-0.98	12.9
03/10/2023 16:05	0.0	10.2	7.7	2	1	1013	0.55	-1.02	13.1
03/10/2023 17:06	0.1	9.8	7.9	2	1	1013	0.50	-1.25	13.1
03/10/2023 18:05	0.1	9.5	8.0	2	1	1014	0.48	-1.32	13.1
03/10/2023 19:06	0.1	9.6	8.2	2	1	1015	0.54	-1.36	13.1
03/10/2023 20:05	0.0	9.3	8.4	2	1	1016	0.63	-1.34	13.1
03/10/2023 21:06	0.0	9.1	8.6	2	1	1017	0.67	-1.18	13.0
03/10/2023 22:05	0.0	8.9	8.7	2	1	1017	0.65	-0.87	12.9
03/10/2023 23:06	0.0	8.9	8.8	2	1	1017	0.60	-0.79	12.8
04/10/2023 00:05	0.0	8.7	8.9	2	1	1017	0.49	-0.44	12.8
04/10/2023 01:06	0.0	8.7	8.9	2	1	1018	0.45	-0.31	12.6
04/10/2023 02:05	0.1	8.6	8.9	2	1	1017	0.30	-0.23	12.6
04/10/2023 03:06	0.1	8.9	8.8	2	1	1017	0.18	-0.18	12.5
04/10/2023 04:05	0.0	8.9	8.7	2	1	1017	0.07	-0.12	12.4
04/10/2023 05:06	0.0	8.9	8.6	2	1	1017	0.00	-0.10	12.4
04/10/2023 06:05	0.0	8.9	8.5	2	1	1017	-0.06	-0.04	12.4
04/10/2023 07:06	0.0	8.9	8.5	2	1	1017	-0.06	-0.13	12.3



 Experts in Continuous Monitoring

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
04/10/2023 08:05	0.0	9.2	8.4	2	1	1017	-0.13	0.00	12.3
04/10/2023 09:06	0.0	9.1	8.3	2	1	1017	-0.06	-0.08	12.3
04/10/2023 10:05	0.0	9.3	8.2	2	1	1017	-0.06	0.01	12.2
04/10/2023 11:06	0.0	9.4	8.2	2	1	1017	-0.01	0.22	12.2
04/10/2023 12:05	0.0	9.4	8.1	2	1	1017	-0.03	0.37	12.3
04/10/2023 13:06	0.0	9.7	8.0	1	1	1016	-0.05	0.36	12.3
04/10/2023 14:05	0.1	9.8	8.0	1	1	1016	-0.13	0.31	12.4
04/10/2023 15:06	0.0	9.6	7.9	1	1	1016	-0.12	0.37	12.6
04/10/2023 16:05	0.0	10.0	7.8	2	1	1015	-0.20	0.34	12.7
04/10/2023 17:06	0.0	9.8	7.7	2	1	1015	-0.22	0.16	12.9
04/10/2023 18:05	0.0	10.0	7.7	2	1	1015	-0.28	0.14	13.0
04/10/2023 19:06	0.2	10.0	7.7	2	1	1015	-0.24	0.18	13.1
04/10/2023 20:05	0.0	10.0	7.6	2	1	1015	-0.18	0.00	13.1
04/10/2023 21:06	0.1	10.0	7.6	2	1	1015	-0.13	0.07	13.0
04/10/2023 22:05	0.0	10.3	7.6	2	1	1015	-0.04	0.12	12.9
04/10/2023 23:06	0.1	10.2	7.6	2	1	1015	-0.03	0.15	12.9
05/10/2023 00:05	0.0	10.2	7.6	2	1	1015	0.00	0.07	12.9
05/10/2023 01:06	0.0	10.5	7.5	2	1	1015	0.01	0.02	12.8
05/10/2023 02:05	0.1	10.4	7.5	2	1	1015	0.01	0.08	12.8
05/10/2023 03:06	0.0	10.2	7.5	1	1	1015	0.01	0.07	12.8
05/10/2023 04:05	0.1	10.2	7.5	2	0	1015	0.03	0.00	12.7
05/10/2023 05:06	0.0	10.3	7.5	2	1	1015	-0.03	0.01	12.7
05/10/2023 06:05	0.1	10.2	7.5	1	1	1015	0.02	0.01	12.6
05/10/2023 07:06	0.1	10.2	7.4	1	1	1015	0.03	-0.17	12.6
05/10/2023 08:05	0.1	10.4	7.4	1	1	1015	0.08	-0.20	12.6
05/10/2023 09:06	0.1	10.3	7.5	2	1	1016	0.14	-0.19	12.6
05/10/2023 10:05	0.0	10.3	7.5	1	1	1017	0.18	-0.13	12.6
05/10/2023 11:06	0.1	10.4	7.5	1	1	1017	0.24	0.01	12.6
05/10/2023 12:05	0.0	10.4	7.5	2	1	1017	0.21	0.24	12.7
05/10/2023 13:06	0.1	10.4	7.5	1	1	1016	0.11	0.29	12.8
05/10/2023 14:05	0.1	10.0	7.5	1	1	1016	0.04	0.46	12.9
05/10/2023 15:06	0.1	10.3	7.4	2	1	1015	-0.04	0.55	12.9
05/10/2023 16:05	0.1	10.3	7.4	1	1	1014	-0.20	0.78	12.9
05/10/2023 17:06	0.0	10.4	7.3	1	1	1014	-0.31	0.56	13.0
05/10/2023 18:05	0.0	10.4	7.3	1	1	1013	-0.46	0.71	13.0
05/10/2023 19:06	0.0	10.5	7.2	1	1	1013	-0.45	0.57	13.0
05/10/2023 20:05	0.0	10.6	7.2	1	1	1013	-0.43	0.51	13.0
05/10/2023 21:06	0.0	10.5	7.1	1	0	1013	-0.37	0.47	13.0
05/10/2023 22:05	0.0	10.6	7.1	1	0	1013	-0.33	0.31	13.0
05/10/2023 23:06	0.0	10.7	7.0	1	1	1012	-0.26	0.54	13.0
06/10/2023 00:05	0.0	11.2	7.0	1	0	1013	-0.17	0.54	13.0
06/10/2023 01:06	0.0	10.6	7.0	1	0	1012	-0.14	0.67	13.1
06/10/2023 02:05	0.0	10.9	6.9	1	1	1012	-0.17	0.56	13.1
06/10/2023 03:06	0.1	10.8	6.9	1	0	1011	-0.18	0.73	13.1
06/10/2023 04:05	0.1	10.8	6.8	1	1	1011	-0.17	0.64	13.1
06/10/2023 05:06	0.0	11.0	6.8	1	0	1011	-0.25	0.37	13.1
06/10/2023 06:05	0.1	10.8	6.8	1	0	1011	-0.21	0.11	13.2
06/10/2023 07:06	0.0	11.0	6.7	1	0	1011	-0.22	-0.01	13.2
06/10/2023 08:05	0.0	11.1	6.7	1	0	1012	-0.06	-0.02	13.3
06/10/2023 09:06	0.0	10.9	6.7	1	0	1012	0.04	0.00	13.3
06/10/2023 10:05	0.1	11.1	6.7	1	0	1012	0.14	-0.12	13.3
06/10/2023 11:06	0.1	11.1	6.7	1	0	1012	0.14	0.01	13.4
06/10/2023 12:05	0.1	11.2	6.7	1	1	1013	0.29	0.39	13.4
06/10/2023 13:06	0.1	10.7	6.7	1	1	1013	0.23	0.36	13.5
06/10/2023 14:05	0.1	10.8	6.7	1	0	1012	0.11	0.46	13.6
06/10/2023 15:06	0.0	10.8	6.7	1	0	1012	0.01	0.25	13.7
06/10/2023 16:05	0.1	11.0	6.7	1	0	1011	-0.10	0.11	13.8
06/10/2023 17:06	0.0	11.0	6.6	1	0	1012	-0.04	0.06	13.9
06/10/2023 18:05	0.1	10.8	6.6	1	1	1013	0.03	0.01	13.9
06/10/2023 19:06	0.0	11.3	6.6	1	0	1013	0.03	0.28	14.0
06/10/2023 20:05	0.0	11.0	6.6	1	1	1013	0.10	0.19	14.1
06/10/2023 21:06	0.0	11.1	6.6	1	0	1013	0.14	0.19	14.1
06/10/2023 22:05	0.1	11.2	6.6	1	0	1013	0.18	0.15	14.1
06/10/2023 23:06	0.1	11.1	6.6	1	0	1013	0.25	0.31	14.1
07/10/2023 00:05	0.1	11.1	6.6	1	0	1013	0.16	0.23	14.1
07/10/2023 01:06	0.0	10.9	6.5	1	0	1013	0.05	0.53	14.1
07/10/2023 02:05	0.1	11.1	6.5	1	0	1013	0.01	0.30	14.1
07/10/2023 03:06	0.0	11.1	6.5	1	0	1013	-0.10	0.22	14.1
07/10/2023 04:05	0.0	10.9	6.5	1	0	1013	-0.04	0.36	14.1
07/10/2023 05:06	0.0	11.3	6.4	1	0	1013	-0.03	0.44	14.1
07/10/2023 06:05	0.1	11.2	6.4	1	0	1013	-0.09	0.00	14.1
07/10/2023 07:06	0.0	11.2	6.4	1	0	1012	-0.12	0.17	14.0
07/10/2023 08:05	0.1	11.4	6.4	1	0	1013	0.04	-0.15	13.9
07/10/2023 09:06	0.1	11.1	6.4	1	0	1014	0.05	0.07	13.9
07/10/2023 10:05	0.1	11.1	6.4	1	0	1014	0.19	0.04	13.8
07/10/2023 11:06	0.0	11.2	6.4	1	0	1014	0.17	0.06	13.8
07/10/2023 12:05	0.0	11.2	6.4	1	0	1014	0.17	-0.15	13.8
07/10/2023 13:06	0.1	11.4	6.3	1	0	1014	0.20	0.10	13.8
07/10/2023 14:05	0.1	11.2	6.4	1	0	1015	0.30	0.11	13.8
07/10/2023 15:06	0.1	11.2	6.3	1	0	1015	0.18	-0.10	13.9
07/10/2023 16:05	0.0	11.1	6.3	1	0	1015	0.16	-0.01	14.0
07/10/2023 17:06	0.0	11.4	6.3	1	0	1015	0.14	-0.21	14.1
07/10/2023 18:05	0.1	11.2	6.3	1	0	1015	0.15	-0.26	14.3
07/10/2023 19:06	0.1	11.2	6.3	1	0	1016	0.18	-0.52	14.3
07/10/2023 20:05	0.1	11.2	6.4	1	0	1016	0.23	-0.45	14.4
07/10/2023 21:06	0.0	11.2	6.5	1	0	1017	0.23	-0.80	14.4
07/10/2023 22:05	0.0	11.3	6.5	1	0	1017	0.28	-0.51	14.4
07/10/2023 23:06	0.0	11.0	6.6	1	0	1018	0.41	-0.68	14.4
08/10/2023 00:05	0.1	10.7	6.8	1	0	1018	0.36	-1.02	14.3
08/10/2023 01:06	0.0	10.6	6.9	1	0	1019	0.47	-0.58	14.3
08/10/2023 02:05	0.1	10.3	7.0	1	0	1020	0.49	-0.62	14.2
08/10/2023 03:06	0.1	10.3	7.1	1	0	1020	0.43	-0.55	14.1
08/10/2023 04:05	0.1	10.3	7.2	1	0	1020	0.37	-0.36	14.1
08/10/2023 05:06	0.0	10.0	7.2	1	0	1020	0.34	-0.20	13.9
08/10/2023 06:06	0.0	10.0	7.2	1	0	1020	0.21	-0.11	13.9
08/10/2023 07:05	0.0	10.4	7.2	1	0	1019	0.17	-0.23	13.8
08/10/2023 08:06	0.0	10.4	7.2	1	0	1019	0.06	-0.26	13.8
08/10/2023 09:05	0.0	10.0	7.1	1	0	1020	0.00	-0.12	13.8
08/10/2023 10:06	0.0	10.5	7.1	1	0	1020	0.04	-0.02	13.7
08/10/2023 11:05	0.0	10.4	7.0	1	0	1020	0.01	0.16	13.7
08/10/2023 12:06	0.0	10.5	7.0	1	0	1020	-0.03	0.47	13.7
08/10/2023 13:05	0.1	10.3	6.9	1	0	1019	-0.06	0.47	13.8
08/10/2023 14:06	0.1	10.4	6.8	1	0	1018	-0.16	0.80	13.9
08/10/2023 15:05	0.0	10.5	6.7	1	0	1018	-0.17	0.76	14.0
08/10/2023 16:06	0.0	10.6	6.6	1	0	1017	-0.35	0.57	14.1
08/10/2023 17:05	0.0	10.7	6.5	1	0	1016	-0.44	0.55	14.2
08/10/2023 18:06	0.0	11.1	6.4	1	0	1016	-0.44	0.48	14.3
08/10/2023 19:05	0.0	10.9	6.3	1	0	1016	-0.44	0.37	14.4
08/10/2023 20:06	0.0	11.2	6.3	1	0	1016	-0.42	0.41	14.4
08/10/2023 21:05	0.1	11.2	6.2	1	0	1016	-0.28	0.39	14.4
08/10/2023 22:06	0.0	11.3	6.1	1	0	1016	-0.27	0.68	14.4
08/10/2023 23:05	0.0	11.2	6.1	1	0	1016	-0.14	0.49	14.4
09/10/2023 00:06	0.0	11.1	6.1	1	0	1015	-0.16	0.64	14.3
09/10/2023 01:05	0.1	11.4	6.0	1	0	1015	-0.15	0.42	14.3
09/10/2023 02:06	0.1	11.4	6.0	1	0	1015	-0.15	0.46	14.3
09/10/2023 03:05	0.1	11.5	5.9	1	0	1015	-0.15	0.24	14.3
09/10/2023 04:06	0.0	11.6	5.9	1	0	1014	-0.18	0.11	14.3
09/10/2023 05:05	0.0	11.3	5.9	1	0	1015	-0.10	0.13	14.3



Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
09/10/2023 06:06	0.0	11.5	5.9	1	0	1015	-0.03	0.05	14.2
09/10/2023 07:05	0.0	11.5	5.8	1	0	1015	0.04	-0.06	14.2
09/10/2023 08:06	0.1	11.6	5.8	1	0	1016	0.07	-0.05	14.2
09/10/2023 09:05	0.1	11.4	5.8	1	0	1016	0.15	0.00	14.2
09/10/2023 10:06	0.0	11.3	5.8	1	0	1017	0.22	-0.15	14.2
09/10/2023 11:05	0.0	11.6	5.8	1	0	1017	0.31	0.06	14.2
09/10/2023 12:06	0.0	11.3	5.8	1	0	1017	0.31	0.24	14.3
09/10/2023 13:05	0.0	11.5	5.8	1	0	1017	0.21	0.26	14.4
09/10/2023 14:06	0.0	11.4	5.8	1	0	1016	0.13	0.36	14.6
09/10/2023 15:05	0.0	11.3	5.8	1	0	1016	0.05	0.44	14.8
09/10/2023 16:06	0.0	11.5	5.8	1	0	1016	-0.06	0.40	14.9
09/10/2023 17:05	0.0	11.6	5.8	1	0	1015	-0.18	0.34	15.1
09/10/2023 18:06	0.0	11.4	5.7	1	0	1015	-0.26	0.30	15.1
09/10/2023 19:05	0.0	11.4	5.7	1	0	1015	-0.33	0.51	15.1
09/10/2023 20:06	0.0	11.6	5.7	1	0	1015	-0.29	0.44	15.1
09/10/2023 21:05	0.1	11.5	5.6	1	0	1014	-0.28	0.52	15.1
09/10/2023 22:06	0.0	11.7	5.6	1	0	1014	-0.23	0.74	14.9
09/10/2023 23:05	0.0	12.0	5.6	0	0	1014	-0.22	0.77	14.9
10/10/2023 00:06	0.0	11.6	5.5	1	0	1013	-0.25	0.86	14.8
10/10/2023 01:05	0.0	11.7	5.5	1	0	1013	-0.28	0.79	14.7
10/10/2023 02:06	0.1	12.1	5.4	1	0	1012	-0.33	0.86	14.6
10/10/2023 03:05	0.1	11.6	5.4	1	0	1012	-0.36	1.19	14.6
10/10/2023 04:06	0.1	11.8	5.3	1	0	1012	-0.34	0.97	14.5
10/10/2023 05:05	0.0	12.1	5.3	0	0	1011	-0.44	1.22	14.4
10/10/2023 06:06	0.1	11.9	5.2	0	0	1011	-0.42	1.06	14.4
10/10/2023 07:05	0.1	12.2	5.2	1	0	1010	-0.43	0.74	14.3
10/10/2023 08:06	0.1	12.1	5.1	0	0	1010	-0.40	0.82	14.3
10/10/2023 09:05	0.0	12.2	5.1	1	0	1010	-0.29	1.19	14.2
10/10/2023 10:06	0.0	12.1	5.1	1	0	1010	-0.27	1.20	14.1
10/10/2023 11:05	0.0	12.2	5.0	1	0	1009	-0.29	1.25	14.1
10/10/2023 12:06	0.1	12.5	5.0	1	0	1009	-0.22	1.49	14.2
10/10/2023 13:05	0.0	12.3	4.9	1	0	1008	-0.26	1.53	14.3
10/10/2023 14:06	0.0	12.1	4.8	1	0	1008	-0.26	1.72	14.4
10/10/2023 15:05	0.1	12.2	4.8	1	0	1007	-0.30	1.63	14.6
10/10/2023 16:06	0.0	12.4	4.8	0	0	1006	-0.45	1.80	14.7
10/10/2023 17:05	0.1	12.4	4.7	0	0	1006	-0.51	1.62	14.8
10/10/2023 18:06	0.0	12.5	4.7	1	0	1005	-0.53	1.39	14.8
10/10/2023 19:05	0.1	12.3	4.6	1	0	1005	-0.53	1.13	14.8
10/10/2023 20:06	0.0	12.4	4.6	1	0	1004	-0.50	1.27	14.8
10/10/2023 21:05	0.1	12.7	4.6	1	0	1005	-0.38	1.18	14.8
10/10/2023 22:06	0.0	12.4	4.5	0	0	1004	-0.39	1.63	14.7
10/10/2023 23:05	0.0	12.7	4.5	1	0	1004	-0.30	1.15	14.6
11/10/2023 00:06	0.0	12.5	4.5	1	0	1004	-0.24	1.09	14.6
11/10/2023 01:05	0.0	12.6	4.4	0	0	1003	-0.27	0.95	14.5
11/10/2023 02:06	0.0	12.8	4.4	1	0	1003	-0.21	1.65	14.5
11/10/2023 03:05	0.0	12.8	4.4	0	0	1003	-0.21	1.03	14.5
11/10/2023 04:06	0.0	12.6	4.3	1	0	1003	-0.23	1.07	14.5
11/10/2023 05:05	0.0	12.4	4.3	1	0	1002	-0.30	0.71	14.4
11/10/2023 06:06	0.0	12.7	4.2	1	0	1002	-0.24	0.31	14.4
11/10/2023 07:05	0.1	12.7	4.2	1	0	1002	-0.24	-0.08	14.4
11/10/2023 08:06	0.0	12.6	4.2	1	0	1002	-0.09	-0.04	14.4
11/10/2023 09:05	0.0	12.6	4.2	0	0	1003	0.00	-0.13	14.3
11/10/2023 10:06	0.0	12.8	4.2	0	0	1004	0.17	0.11	14.3
11/10/2023 11:05	0.0	12.8	4.2	0	0	1005	0.23	0.19	14.3
11/10/2023 12:06	0.1	12.8	4.2	0	0	1005	0.43	0.11	14.2
11/10/2023 13:05	0.0	12.7	4.2	0	0	1005	0.36	0.06	14.1
11/10/2023 14:06	0.1	12.7	4.3	0	0	1005	0.36	0.08	14.1
11/10/2023 15:05	0.1	12.7	4.3	1	0	1005	0.36	-0.09	14.0
11/10/2023 16:06	0.0	12.4	4.3	1	0	1005	0.26	-0.10	13.9
11/10/2023 17:05	0.0	12.7	4.3	1	0	1005	0.13	-0.20	13.9
11/10/2023 18:06	0.0	12.8	4.3	0	0	1006	0.13	-0.28	13.8
11/10/2023 19:05	0.0	12.8	4.3	0	0	1006	0.11	-0.25	13.7
11/10/2023 20:06	0.0	12.7	4.3	0	0	1007	0.23	-0.34	13.6
11/10/2023 21:05	0.0	12.3	4.4	0	0	1007	0.32	-0.10	13.5
11/10/2023 22:06	0.1	12.4	4.4	0	0	1007	0.31	-0.16	13.4
11/10/2023 23:05	0.0	12.4	4.5	0	0	1008	0.36	-0.17	13.3
12/10/2023 00:06	0.1	12.4	4.6	1	0	1008	0.30	-0.09	13.2
12/10/2023 01:05	0.0	12.3	4.6	1	0	1008	0.26	-0.15	13.0
12/10/2023 02:06	0.0	12.5	4.6	0	0	1008	0.25	-0.13	12.9
12/10/2023 03:05	0.0	12.2	4.6	1	0	1008	0.17	-0.10	12.7
12/10/2023 04:06	0.1	12.4	4.6	1	0	1008	0.11	-0.16	12.4
12/10/2023 05:05	0.1	12.3	4.6	1	0	1008	0.11	-0.21	12.3
12/10/2023 06:06	0.0	12.2	4.6	0	0	1008	0.05	-0.19	12.1
12/10/2023 07:05	0.0	12.4	4.6	0	0	1009	0.14	-0.11	11.9
12/10/2023 08:06	0.0	12.4	4.7	0	0	1009	0.15	-0.12	11.8
12/10/2023 09:05	0.1	12.0	4.7	0	0	1010	0.24	0.07	11.6
12/10/2023 10:06	0.0	12.0	4.7	0	0	1010	0.27	0.31	11.5
12/10/2023 11:05	0.1	11.9	4.6	0	0	1010	0.25	0.45	11.5
12/10/2023 12:06	0.0	11.9	4.6	0	0	1010	0.18	0.70	11.6
12/10/2023 13:05	0.1	12.2	4.5	0	0	1009	0.09	0.77	11.8
12/10/2023 14:06	0.0	12.3	4.5	0	0	1008	-0.06	0.82	12.0
12/10/2023 15:05	0.0	12.5	4.4	0	0	1007	-0.19	0.72	12.1
12/10/2023 16:06	0.1	12.4	4.3	0	0	1007	-0.40	0.48	12.3
12/10/2023 17:05	0.1	12.3	4.2	0	0	1006	-0.50	0.69	12.3
12/10/2023 18:06	0.1	12.7	4.2	0	0	1006	-0.53	1.07	12.3
12/10/2023 19:05	0.0	12.5	4.1	0	0	1006	-0.48	1.15	12.3
12/10/2023 20:06	0.1	12.8	4.1	0	0	1005	-0.45	1.67	12.2
12/10/2023 21:05	0.0	12.6	4.0	0	0	1004	-0.48	2.06	12.1
12/10/2023 22:06	0.0	12.5	3.9	0	0	1004	-0.46	2.14	11.9
12/10/2023 23:05	0.1	13.0	3.9	0	0	1003	-0.52	2.45	11.8
13/10/2023 00:06	0.1	12.7	3.8	0	0	1001	-0.61	2.73	11.8
13/10/2023 01:05	0.1	12.8	3.7	0	0	1000	-0.70	3.16	11.7
13/10/2023 02:06	0.1	12.7	3.6	0	0	999	-0.88	3.42	11.7
13/10/2023 03:05	0.0	12.8	3.6	0	0	997	-0.98	3.66	11.6
13/10/2023 04:06	0.1	12.8	3.5	0	0	996	-1.10	3.45	11.6
13/10/2023 05:05	0.1	13.0	3.4	0	0	994	-1.26	3.40	11.6
13/10/2023 06:06	0.0	13.3	3.3	0	0	992	-1.31	2.71	11.7
13/10/2023 07:05	0.1	12.9	3.3	0	0	991	-1.24	2.66	11.7
13/10/2023 08:06	0.1	13.0	3.2	0	0	991	-1.21	1.81	11.7
13/10/2023 09:05	0.1	13.2	3.2	0	0	991	-0.99	1.50	11.7
13/10/2023 10:06	0.1	13.2	3.1	0	0	991	-0.85	1.04	11.8
13/10/2023 11:05	0.1	13.2	3.1	0	0	992	-0.49	0.64	11.8
13/10/2023 12:06	0.1	13.5	3.0	0	0	992	-0.22	0.42	11.8
13/10/2023 13:05	0.1	13.6	3.0	0	0	992	0.04	0.33	11.9
13/10/2023 14:06	0.1	13.7	3.0	0	0	993	0.21	0.09	11.9
13/10/2023 15:05	0.0	13.0	3.0	0	0	993	0.31	0.07	12.0
13/10/2023 16:06	0.1	13.6	3.0	0	0	993	0.28	-0.17	12.1
13/10/2023 17:05	0.1	13.6	3.0	0	0	994	0.40	-0.38	12.1
13/10/2023 18:06	0.1	13.4	3.0	0	0	994	0.30	-0.47	12.1
13/10/2023 19:05	0.1	13.7	3.0	0	0	995	0.38	-0.97	12.0
13/10/2023 20:06	0.1	13.5	3.1	0	0	996	0.44	-1.03	11.9
13/10/2023 21:05	0.1	13.5	3.2	0	0	997	0.45	-0.97	11.8
13/10/2023 22:05	0.1	13.2	3.4	0	0	998	0.62	-1.17	11.6
13/10/2023 23:06	0.1	13.2	3.6	0	0	999	0.72	-1.35	11.5
14/10/2023 00:05	0.0	13.0	3.8	0	0	1000	0.72	-1.33	11.4
14/10/2023 01:06	0.1	12.3	4.1	0	0	1001	0.84	-1.21	11.2
14/10/2023 02:05	0.1	12.3	4.4	0	0	1002	0.88	-1.35	11.1
14/10/2023 03:06	0.1	11.7	4.7	0	0	1003	0.86	-1.27	10.9

Date and Time	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	CO ppm/v	H ₂ S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Flow Ltr/hr	Temperature °C
14/10/2023 04:05	0.1	11.5	4.9	1	0	1003	0.84	-1.64	10.8
14/10/2023 05:06	0.1	11.1	5.1	1	0	1004	0.80	-1.77	10.7
14/10/2023 06:05	0.1	10.7	5.4	1	0	1005	0.76	-1.68	10.6
14/10/2023 07:06	0.1	10.5	5.6	1	0	1006	0.84	-1.73	10.4
14/10/2023 08:05	0.1	10.2	5.9	0	0	1008	0.87	-1.79	10.3
14/10/2023 09:05	0.1	9.9	6.1	1	0	1009	0.93	-1.59	10.2
14/10/2023 10:06	0.1	9.5	6.3	1	0	1011	0.99	-1.27	10.2
14/10/2023 11:05	0.1	9.2	6.5	1	0	1011	1.02	-1.37	10.2
14/10/2023 12:06	0.1	9.3	6.5	1	0	1012	0.95	-1.34	10.3
14/10/2023 13:05	0.1	9.4	6.5	1	0	1012	0.85	-0.94	10.4
14/10/2023 14:06	0.0	9.3	6.5	1	0	1012	0.76	-0.83	10.5
14/10/2023 15:05	0.1	9.3	6.5	1	0	1013	0.62	-0.88	10.6
14/10/2023 16:06	0.1	9.2	6.4	1	0	1013	0.42	-0.95	10.6
14/10/2023 17:05	0.1	9.5	6.3	1	0	1013	0.27	-1.13	10.6
14/10/2023 18:06	0.1	9.4	6.3	1	0	1013	0.22	-1.10	10.6
14/10/2023 19:05	0.1	9.6	6.3	1	0	1014	0.22	-1.20	10.5
14/10/2023 20:06	0.1	9.6	6.3	0	0	1015	0.32	-1.10	10.4
14/10/2023 21:05	0.1	9.7	6.3	0	0	1015	0.34	-1.01	10.3
14/10/2023 22:06	0.1	9.4	6.4	0	0	1016	0.39	-1.11	10.1
14/10/2023 23:05	0.1	9.5	6.4	0	0	1016	0.45	-1.10	9.9
15/10/2023 00:06	0.1	9.6	6.5	0	0	1017	0.49	-0.94	9.8
15/10/2023 01:05	0.1	9.5	6.5	0	0	1017	0.51	-0.71	9.6
15/10/2023 02:06	0.1	9.5	6.6	0	0	1018	0.52	-0.86	9.4
15/10/2023 03:05	0.1	9.3	6.6	0	0	1018	0.45	-0.89	9.3
15/10/2023 04:06	0.1	9.4	6.5	0	0	1018	0.39	-0.68	9.1
15/10/2023 05:05	0.1	9.5	6.6	0	0	1019	0.38	-0.71	8.9
15/10/2023 06:05	0.1	9.6	6.6	0	0	1020	0.41	-0.74	8.8
15/10/2023 07:06	0.1	9.6	6.6	0	0	1020	0.35	-0.68	8.7
15/10/2023 08:05	0.1	9.6	6.5	0	0	1020	0.35	-0.70	8.5
15/10/2023 09:06	0.1	9.8	6.5	0	0	1021	0.43	-0.58	8.4
15/10/2023 10:05	0.1	9.7	6.5	0	0	1022	0.45	-0.34	8.3
15/10/2023 11:06	0.1	9.8	6.5	0	0	1022	0.49	-0.22	8.4
15/10/2023 12:06	0.1	9.8	6.4	0	0	1022	0.42	-0.18	8.4
15/10/2023 13:05	0.1	9.8	6.3	0	0	1022	0.31	-0.13	8.6
15/10/2023 14:06	0.1	9.8	6.2	0	0	1021	0.24	-0.12	8.8
15/10/2023 15:05	0.1	10.2	6.1	0	0	1021	0.13	-0.18	8.9
15/10/2023 16:06	0.1	10.4	6.0	0	0	1021	-0.06	-0.17	9.1
15/10/2023 17:05	0.1	10.4	5.9	0	0	1021	-0.13	-0.11	9.1
15/10/2023 18:06	0.1	10.7	5.8	0	0	1021	-0.17	-0.23	9.2
15/10/2023 19:05	0.1	10.8	5.7	0	0	1021	-0.19	-0.15	9.2
15/10/2023 20:06	0.1	11.1	5.7	0	0	1021	-0.17	-0.06	9.2
15/10/2023 21:05	0.1	10.9	5.6	0	0	1021	-0.09	-0.11	9.1
15/10/2023 22:06	0.0	11.1	5.5	0	0	1021	-0.05	-0.09	9.0
15/10/2023 23:05	0.1	11.2	5.5	0	0	1020	-0.05	0.00	8.9
16/10/2023 00:06	0.0	11.3	5.4	0	0	1020	-0.03	0.03	8.8
16/10/2023 01:05	0.1	11.2	5.4	0	0	1020	-0.05	0.07	8.7
16/10/2023 02:06	0.1	11.3	5.3	0	0	1020	-0.09	0.09	8.6
16/10/2023 03:05	0.1	11.2	5.3	0	0	1020	-0.08	0.16	8.4
16/10/2023 04:06	0.1	11.6	5.2	0	0	1020	-0.14	0.18	8.4
16/10/2023 05:05	0.0	11.7	5.1	0	0	1019	-0.17	0.09	8.3
16/10/2023 06:06	0.1	11.9	5.1	0	0	1019	-0.17	0.03	8.1
16/10/2023 07:05	0.1	11.8	5.0	0	0	1019	-0.22	0.06	8.1
16/10/2023 08:06	0.1	11.8	5.0	0	0	1019	-0.19	0.11	7.9
16/10/2023 09:05	0.1	11.8	4.9	0	0	1019	-0.13	0.17	7.9
16/10/2023 10:06	0.1	11.8	4.8	0	0	1019	-0.09	0.00	7.8
16/10/2023 11:05	0.1	11.9	4.8	0	0	1019	-0.03		7.8
16/10/2023 12:06	0.1	11.9	4.8	0	0	1019	-0.03		7.9



Experts in Continuous Monitoring

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix E

GasClam and GasSentinel overview

GGG GasClam® Instrumentation Overview & Deployment Information

Experts in Continuous Monitoring



Introduction

GGG GasClam® instruments are high frequency in situ borehole gas monitoring devices, suitable for detection of a wide range of ground gases commonly found in borehole monitoring. The equipment is ATEX approved and IP68 rated and can operate safely in explosive atmospheres and survive flooding environments. They can also be secured to building walls or placed internally to monitor sub-floor spaces or indoor air.

GGG currently have three versions of the instrument, a bulk gas version which monitors methane, carbon dioxide and oxygen; a trace gas version which also includes sensors for hydrogen sulphide, carbon monoxide and total volatile organic compounds; and a specialized instrument that can monitor methane and carbon dioxide between 0 – 5%v/v at a high resolution of 0.05% in addition to the other gases. All versions record atmospheric pressure, borehole pressure and temperature as standard.

Should your site be influenced by water level changes (e.g. tidal or flooding), GGG can also provide water level logging alongside the high frequency ground gas data if required.

GasClam® Sensor Specifications, Service and Maintenance

The GGG GasClam® 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
Methane (0-100%)	Infrared	0 - 100%v/v	1% of measuring range above 50%, 0.5% below 50%
#Methane (0-5%)	Infrared	0-5%v/v	0.05%
Carbon Dioxide (0-100%)	Infrared	0 - 100%v/v	1% of measuring range above 50%, 0.5% below 50%
*Carbon Dioxide (0-5%)	Infrared	0-5%v/v	0.05%
Oxygen	Electrochemical	0 - 25%v/v	0.1%
*Hydrogen Sulphide	Electrochemical	0 - 100ppmv	1ppmv
*Carbon Monoxide	Electrochemical	0 - 1000ppmv	1ppmv
*Total Volatile Organic Compounds	PID	0 - 4000ppmv	1ppmv
Atmospheric Pressure	Piezoelectric	800 - 1200mb	1mBar
Borehole Pressure	Piezoelectric	800 - 1200mb	1mBar
Temperature	Internal chip	-5°C to +50°C	1°C

Only installed on the 0-5% High Resolution GasClam® * Only installed in VOC GasClam®

The GGG GasClam® equipment is battery powered and runs off two D cell batteries. The bulk gas versions can take approximately 1350 readings (approximately 8 weeks based on hourly sampling), with the other versions taking approximately 600 readings (approximately 3.5 weeks based on hourly sampling) before the batteries need replacing.

Deployment Requirements (IMPORTANT)

For GGG GasClam® instruments to be deployed, standard 50mm installation standpipes are required (larger diameter boreholes can be accommodated for). Headworks with enough clearance and a suitable secure cover are also required. GGG recommend that a minimum 8 inch diameter flush fit cover (for example MW8 covers available from Stuart Wells <http://wellservices.stuartgroup.ltd.uk/>) be used. A minimum 100mm clearance is required from the top of the 50mm standpipe to the underside of the cover. A minimum 150mm internal headworks diameter is required (75mm clear radius from centre of stand pipe). We also recommend that minimum standing water level is greater than 0.9m below the standpipe top due to the instrument halting gas sampling automatically to avoid taking water internally.

GGG can also deploy GasClam® instruments within buildings or fix them to external walls within protective and secure housing should you wish to monitor indoor air or subfloor void spaces of existing buildings or for verification purposes. If the above requirements cannot be achieved, please contact GGG to discuss site specific deployment options – there probably is one!

GasClam Insurance

GGG offer insurance to cover the instruments against theft from site and is an optional part of our service.

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix F

Surface emissions survey data

GGs Surface Emissions Survey Data

Project Ref:	GGs3070
Location:	Skelton Grange, Phase 2 post-earthworks - Phase 2A
Specialist:	EC and MR
Survey Date:	18/10/23
Total samples:	1305



Minimum, Maximum and Range Table

	4
	CH
Minimum	0
Maximum	23
Range	23

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 09:37	0	53.7755716	-1.4593241
18/10/2023 09:37	0	53.7755469	-1.4593668
18/10/2023 09:37	0	53.7755107	-1.4594258
18/10/2023 09:37	0	53.7754826	-1.459473
18/10/2023 09:37	0	53.7754514	-1.4595275
18/10/2023 09:37	0	53.7754104	-1.45955
18/10/2023 09:37	0	53.7753862	-1.4595095
18/10/2023 09:37	0	53.7753534	-1.4594995
18/10/2023 09:37	0	53.7753211	-1.4595138
18/10/2023 09:37	0	53.7752969	-1.4595343
18/10/2023 09:37	0	53.7752276	-1.4595936
18/10/2023 09:37	0	53.7751941	-1.459612
18/10/2023 09:37	0	53.7751622	-1.4596385
18/10/2023 09:37	0	53.7751267	-1.4596638
18/10/2023 09:37	4	53.7750884	-1.4596935
18/10/2023 09:37	0	53.7750831	-1.4596911
18/10/2023 09:37	0	53.7750874	-1.459688
18/10/2023 09:37	0	53.7750834	-1.4596566
18/10/2023 09:37	0	53.7750549	-1.4596775
18/10/2023 09:38	1	53.7750244	-1.459684
18/10/2023 09:38	0	53.7749952	-1.4597055
18/10/2023 09:38	2	53.7749632	-1.459707
18/10/2023 09:38	0	53.7749371	-1.4597061
18/10/2023 09:38	0	53.7749037	-1.4597313
18/10/2023 09:38	0	53.7748682	-1.4597558
18/10/2023 09:38	0	53.7748387	-1.4597525
18/10/2023 09:38	2	53.7748144	-1.4597606
18/10/2023 09:38	2	53.7747979	-1.4597566
18/10/2023 09:38	0	53.7747796	-1.4597613
18/10/2023 09:38	0	53.7747586	-1.4597638
18/10/2023 09:38	0	53.7747272	-1.4597735
18/10/2023 09:38	0	53.7746981	-1.4597955
18/10/2023 09:38	0	53.7746754	-1.4597848
18/10/2023 09:38	0	53.7746439	-1.4598058
18/10/2023 09:38	0	53.7746146	-1.4598296
18/10/2023 09:38	0	53.7746027	-1.4598318
18/10/2023 09:38	0	53.7746079	-1.4598116
18/10/2023 09:38	0	53.7745929	-1.4598278
18/10/2023 09:38	0	53.7745716	-1.4598658
18/10/2023 09:39	0	53.7745512	-1.4598971
18/10/2023 09:39	0	53.7745406	-1.4599183
18/10/2023 09:39	0	53.7745397	-1.4599321
18/10/2023 09:39	0	53.7745297	-1.4599596
18/10/2023 09:39	0	53.7745104	-1.4599833
18/10/2023 09:39	0	53.7744872	-1.4599883
18/10/2023 09:39	0	53.7744614	-1.4599823
18/10/2023 09:39	0	53.7744349	-1.4599841
18/10/2023 09:39	0	53.7744049	-1.4599506
18/10/2023 09:39	0	53.7743796	-1.4599318
18/10/2023 09:39	0	53.7743641	-1.459963
18/10/2023 09:39	0	53.7743554	-1.4599994
18/10/2023 09:39	0	53.7743362	-1.4600355
18/10/2023 09:39	0	53.7743157	-1.4600793
18/10/2023 09:39	0	53.7743014	-1.4601028
18/10/2023 09:39	0	53.7742917	-1.460135
18/10/2023 09:39	0	53.7743146	-1.4601463
18/10/2023 09:39	0	53.7743399	-1.4601525
18/10/2023 09:39	0	53.7743459	-1.4601461
18/10/2023 09:39	0	53.7743724	-1.4601426
18/10/2023 09:40	0	53.7743966	-1.4601306
18/10/2023 09:40	0	53.7744162	-1.4601103
18/10/2023 09:40	0	53.7744404	-1.4600993
18/10/2023 09:40	0	53.7744546	-1.4600918
18/10/2023 09:40	0	53.7744949	-1.4600468
18/10/2023 09:40	0	53.7745297	-1.4600155
18/10/2023 09:40	0	53.7745587	-1.4599825
18/10/2023 09:40	0	53.7745816	-1.4599743
18/10/2023 09:40	2	53.7746057	-1.45996
18/10/2023 09:40	0	53.7746257	-1.4599485
18/10/2023 09:40	0	53.7746516	-1.459933
18/10/2023 09:40	2	53.7746781	-1.4599118
18/10/2023 09:40	0	53.7747056	-1.4598993
18/10/2023 09:40	0	53.7747436	-1.4598716
18/10/2023 09:40	0	53.7747747	-1.4598606

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 09:40	0	53.7748031	-1.4598503
18/10/2023 09:40	0	53.7748107	-1.4598505
18/10/2023 09:40	0	53.7748244	-1.4598423
18/10/2023 09:40	0	53.7748364	-1.4598313
18/10/2023 09:40	0	53.7748786	-1.4598106
18/10/2023 09:41	0	53.7749029	-1.4597926
18/10/2023 09:41	0	53.7749314	-1.4597825
18/10/2023 09:41	0	53.7749534	-1.4597661
18/10/2023 09:41	3	53.7749791	-1.4597631
18/10/2023 09:41	0	53.7750134	-1.4597361
18/10/2023 09:41	0	53.7750494	-1.4597256
18/10/2023 09:41	2	53.7750794	-1.45972
18/10/2023 09:41	0	53.7751131	-1.4597068
18/10/2023 09:41	1	53.7751412	-1.4597005
18/10/2023 09:41	0	53.7751801	-1.4596845
18/10/2023 09:41	0	53.7752211	-1.4596658
18/10/2023 09:41	0	53.7752614	-1.4596495
18/10/2023 09:41	0	53.7752807	-1.4596273
18/10/2023 09:41	0	53.7752851	-1.4596125
18/10/2023 09:41	0	53.7752722	-1.459612
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18/10/2023 09:41	0	53.7752521	-1.459674
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18/10/2023 09:42	0	53.7752214	-1.4597633
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18/10/2023 09:42	0	53.7752252	-1.4597688
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18/10/2023 09:42	0	53.7751477	-1.459835
18/10/2023 09:42	0	53.7751196	-1.4598453
18/10/2023 09:42	0	53.7750934	-1.459883
18/10/2023 09:42	0	53.7750716	-1.4598755
18/10/2023 09:42	0	53.7750452	-1.459891
18/10/2023 09:42	0	53.7750157	-1.4598926
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18/10/2023 09:42	0	53.7749492	-1.4599345
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18/10/2023 09:43	0	53.7746817	-1.4601276
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18/10/2023 09:43	0	53.7746389	-1.4601443
18/10/2023 09:43	0	53.7746082	-1.4601665
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18/10/2023 09:43	2	53.7745562	-1.460212
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18/10/2023 09:44	0	53.7743196	-1.4603776
18/10/2023 09:44	0	53.7743256	-1.4603866
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18/10/2023 09:44	0	53.7744682	-1.4604113
18/10/2023 09:44	0	53.7745119	-1.460399
18/10/2023 09:44	0	53.7745347	-1.4603938
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18/10/2023 09:45	0	53.7749519	-1.4601496
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18/10/2023 09:45	0	53.7750049	-1.4601905
18/10/2023 09:45	0	53.7749932	-1.4602223
18/10/2023 09:45	0	53.7749852	-1.460255
18/10/2023 09:45	0	53.7749739	-1.4602606
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18/10/2023 09:50	0	53.7742386	-1.4608236
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18/10/2023 09:57	0	53.7742252	-1.4616076
18/10/2023 09:57	0	53.7741912	-1.4616018
18/10/2023 09:57	0	53.7741639	-1.4616005
18/10/2023 09:57	0	53.7741319	-1.461592
18/10/2023 09:57	0	53.7741071	-1.4615888
18/10/2023 09:57	0	53.7741059	-1.461599
18/10/2023 09:57	0	53.7741096	-1.4616463
18/10/2023 09:57	0	53.7741154	-1.4616911
18/10/2023 09:57	0	53.7741391	-1.4617095
18/10/2023 09:57	2	53.7741694	-1.4617281
18/10/2023 09:57	0	53.7741964	-1.4617396
18/10/2023 09:57	0	53.7742272	-1.4617491
18/10/2023 09:57	0	53.7742581	-1.46176
18/10/2023 09:58	0	53.7742849	-1.4617596
18/10/2023 09:58	0	53.7743149	-1.4617675
18/10/2023 09:58	0	53.7743416	-1.4617838
18/10/2023 09:58	0	53.7743716	-1.4617925
18/10/2023 09:58	0	53.7744011	-1.4617971
18/10/2023 09:58	0	53.7744292	-1.4618168
18/10/2023 09:58	0	53.7744617	-1.4618248
18/10/2023 09:58	0	53.7744994	-1.4618308
18/10/2023 09:58	0	53.7745327	-1.4618358
18/10/2023 09:58	0	53.7745604	-1.461848
18/10/2023 09:58	0	53.7745877	-1.4618608
18/10/2023 09:58	0	53.7746177	-1.4618708
18/10/2023 09:58	0	53.7746397	-1.461867
18/10/2023 09:58	0	53.7746356	-1.4619011
18/10/2023 09:58	0	53.7746314	-1.461947
18/10/2023 09:58	0	53.7746227	-1.4619893
18/10/2023 09:58	0	53.7745987	-1.4619953
18/10/2023 09:58	0	53.7745674	-1.4620001
18/10/2023 09:58	0	53.7745392	-1.4619998
18/10/2023 09:58	0	53.7745052	-1.4620001
18/10/2023 09:59	0	53.7744717	-1.4619983
18/10/2023 09:59	0	53.7744449	-1.4619995
18/10/2023 09:59	0	53.7744156	-1.4620091
18/10/2023 09:59	0	53.7743841	-1.4620206
18/10/2023 09:59	0	53.7743489	-1.4620266
18/10/2023 09:59	0	53.7743186	-1.4620328
18/10/2023 09:59	0	53.7742854	-1.462045
18/10/2023 09:59	0	53.7742472	-1.462064

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 09:59	0	53.7741599	-1.462023
18/10/2023 09:59	0	53.7741294	-1.4619968
18/10/2023 09:59	0	53.7741087	-1.4619708
18/10/2023 09:59	0	53.7740812	-1.4619676
18/10/2023 09:59	0	53.7740709	-1.4619651
18/10/2023 09:59	0	53.7740636	-1.4619465
18/10/2023 09:59	0	53.7740589	-1.4619756
18/10/2023 09:59	0	53.7740422	-1.4620291
18/10/2023 09:59	0	53.7740327	-1.4620646
18/10/2023 09:59	0	53.7740252	-1.4620616
18/10/2023 10:00	0	53.7740337	-1.4620755
18/10/2023 10:00	0	53.7740537	-1.4621025
18/10/2023 10:00	0	53.7740749	-1.4621256
18/10/2023 10:00	0	53.7740956	-1.4621426
18/10/2023 10:00	0	53.7741209	-1.4621736
18/10/2023 10:00	0	53.7741516	-1.462181
18/10/2023 10:00	3	53.7741844	-1.4621901
18/10/2023 10:00	1	53.7742146	-1.4621898
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18/10/2023 10:00	0	53.7743151	-1.4621636
18/10/2023 10:00	0	53.7743589	-1.4621631
18/10/2023 10:00	0	53.7743926	-1.4621625
18/10/2023 10:00	0	53.7744261	-1.4621628
18/10/2023 10:00	0	53.7744541	-1.4621588
18/10/2023 10:00	0	53.7744877	-1.4621656
18/10/2023 10:00	0	53.7745086	-1.4621655
18/10/2023 10:00	0	53.7745319	-1.4621633
18/10/2023 10:00	1	53.7745552	-1.4621686
18/10/2023 10:00	0	53.7745792	-1.4621658
18/10/2023 10:01	0	53.7746036	-1.462171
18/10/2023 10:01	0	53.7746096	-1.462198
18/10/2023 10:01	0	53.7746059	-1.462234
18/10/2023 10:01	0	53.7746124	-1.462278
18/10/2023 10:01	0	53.7746146	-1.4623293
18/10/2023 10:01	0	53.7746242	-1.4623261
18/10/2023 10:01	0	53.7745999	-1.4623185
18/10/2023 10:01	0	53.7745681	-1.4622981
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18/10/2023 10:01	0	53.7745034	-1.4622853
18/10/2023 10:01	0	53.7744684	-1.4622868
18/10/2023 10:01	0	53.7744324	-1.4622875
18/10/2023 10:01	0	53.7743961	-1.4622776
18/10/2023 10:01	0	53.7743672	-1.4622723
18/10/2023 10:01	0	53.7743382	-1.4622648
18/10/2023 10:01	2	53.7743142	-1.4622598
18/10/2023 10:01	0	53.7742852	-1.4622563
18/10/2023 10:01	0	53.7742564	-1.4622536
18/10/2023 10:01	0	53.7742231	-1.4622558
18/10/2023 10:01	0	53.7741931	-1.4622508
18/10/2023 10:02	0	53.7741681	-1.4622456
18/10/2023 10:02	0	53.7741401	-1.4622471
18/10/2023 10:02	16	53.7741092	-1.4622426
18/10/2023 10:02	0	53.7741034	-1.4622496
18/10/2023 10:02	0	53.7741196	-1.4622565
18/10/2023 10:02	0	53.7741292	-1.4622478
18/10/2023 10:02	7	53.7741127	-1.4622338
18/10/2023 10:02	0	53.7741117	-1.4622296
18/10/2023 10:02	0	53.7741251	-1.4622331
18/10/2023 10:02	0	53.7741171	-1.4622686
18/10/2023 10:02	0	53.7741006	-1.4622753
18/10/2023 10:02	0	53.7740712	-1.4622715
18/10/2023 10:02	0	53.7740474	-1.4622696
18/10/2023 10:02	0	53.7740306	-1.4622551
18/10/2023 10:02	0	53.7740352	-1.4622531
18/10/2023 10:02	2	53.7740347	-1.4622655
18/10/2023 10:02	0	53.7740307	-1.462277
18/10/2023 10:02	0	53.7740347	-1.4622826
18/10/2023 10:02	0	53.7740291	-1.4623273
18/10/2023 10:02	2	53.7740217	-1.4623385
18/10/2023 10:03	0	53.7740161	-1.4623331
18/10/2023 10:03	0	53.7740121	-1.4623356
18/10/2023 10:03	0	53.7740142	-1.4623398
18/10/2023 10:03	0	53.7740186	-1.4623436
18/10/2023 10:03	0	53.7740154	-1.4623575
18/10/2023 10:03	2	53.7740124	-1.4623873
18/10/2023 10:03	0	53.7740212	-1.4624136
18/10/2023 10:03	0	53.7740441	-1.4624258
18/10/2023 10:03	0	53.7740744	-1.4624471
18/10/2023 10:03	0	53.7741002	-1.4624611
18/10/2023 10:03	0	53.7741264	-1.4624791
18/10/2023 10:03	0	53.7741529	-1.4624956
18/10/2023 10:03	0	53.7741781	-1.462494
18/10/2023 10:03	0	53.7741991	-1.4625126
18/10/2023 10:03	0	53.7742244	-1.4625258
18/10/2023 10:03	0	53.7742529	-1.4625193
18/10/2023 10:03	0	53.7742576	-1.4625188
18/10/2023 10:03	0	53.7742577	-1.4625175
18/10/2023 10:03	0	53.7742614	-1.4625125
18/10/2023 10:03	0	53.7742604	-1.4625095
18/10/2023 10:04	0	53.7742621	-1.4625096

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:04	0	53.7742852	-1.4625055
18/10/2023 10:04	3	53.7743172	-1.4624888
18/10/2023 10:04	0	53.7743421	-1.4624761
18/10/2023 10:04	0	53.7743627	-1.4624643
18/10/2023 10:04	0	53.7743826	-1.4624565
18/10/2023 10:04	0	53.7744071	-1.4624615
18/10/2023 10:04	0	53.7744384	-1.4624685
18/10/2023 10:04	0	53.7744662	-1.4624726
18/10/2023 10:04	0	53.7744872	-1.462483
18/10/2023 10:04	0	53.7745182	-1.4624855
18/10/2023 10:04	0	53.7745487	-1.462484
18/10/2023 10:04	0	53.7745759	-1.4624805
18/10/2023 10:04	0	53.7745949	-1.4624933
18/10/2023 10:04	0	53.7745989	-1.4624883
18/10/2023 10:04	0	53.7745879	-1.4625171
18/10/2023 10:04	0	53.7745931	-1.4625748
18/10/2023 10:04	0	53.7745864	-1.4626183
18/10/2023 10:04	0	53.7745641	-1.4626176
18/10/2023 10:05	0	53.7745394	-1.4626101
18/10/2023 10:05	0	53.7745129	-1.4626078
18/10/2023 10:05	0	53.7744831	-1.4626168
18/10/2023 10:05	0	53.7744647	-1.462624
18/10/2023 10:05	0	53.7744664	-1.462665
18/10/2023 10:05	0	53.7744659	-1.4627228
18/10/2023 10:05	0	53.7744681	-1.4627638
18/10/2023 10:05	0	53.7744801	-1.4627698
18/10/2023 10:05	0	53.7744917	-1.4627761
18/10/2023 10:05	2	53.7745206	-1.4627958
18/10/2023 10:05	0	53.7745412	-1.4628076
18/10/2023 10:05	0	53.7745617	-1.462815
18/10/2023 10:05	0	53.7745867	-1.4628335
18/10/2023 10:05	0	53.7745891	-1.462845
18/10/2023 10:05	0	53.7745832	-1.4628395
18/10/2023 10:05	0	53.7745504	-1.4628388
18/10/2023 10:05	0	53.7745251	-1.4628308
18/10/2023 10:05	0	53.7744916	-1.4628221
18/10/2023 10:05	2	53.7744712	-1.4628123
18/10/2023 10:05	0	53.7744554	-1.4628068
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18/10/2023 10:06	0	53.7744031	-1.4627415
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18/10/2023 10:06	0	53.7743887	-1.4626075
18/10/2023 10:06	10	53.7743779	-1.4626093
18/10/2023 10:06	0	53.7743796	-1.462627
18/10/2023 10:06	0	53.7743897	-1.4626316
18/10/2023 10:06	0	53.7743879	-1.4626298
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18/10/2023 10:06	0	53.7743562	-1.4626521
18/10/2023 10:06	0	53.7743332	-1.4626325
18/10/2023 10:06	0	53.7743091	-1.4626215
18/10/2023 10:06	0	53.7742767	-1.4626206
18/10/2023 10:06	0	53.7742487	-1.4626118
18/10/2023 10:06	0	53.7742161	-1.4626101
18/10/2023 10:06	0	53.7741874	-1.4626113
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18/10/2023 10:07	0	53.7740447	-1.4626178
18/10/2023 10:07	0	53.7740189	-1.4626163
18/10/2023 10:07	0	53.7740126	-1.4626391
18/10/2023 10:07	0	53.7739977	-1.4626681
18/10/2023 10:07	0	53.7739932	-1.4627053
18/10/2023 10:07	0	53.7739954	-1.462748
18/10/2023 10:07	0	53.7740017	-1.4627751
18/10/2023 10:07	0	53.7740189	-1.4628021
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18/10/2023 10:07	0	53.7740707	-1.4628285
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18/10/2023 10:07	0	53.7741387	-1.4628651
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18/10/2023 10:07	0	53.7741992	-1.462854
18/10/2023 10:07	0	53.7742364	-1.4628473
18/10/2023 10:07	0	53.7742656	-1.4628326
18/10/2023 10:07	0	53.7742904	-1.4628273
18/10/2023 10:07	0	53.7743207	-1.462824
18/10/2023 10:08	0	53.7743524	-1.462825
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18/10/2023 10:08	0	53.7743954	-1.4628316
18/10/2023 10:08	0	53.7744071	-1.4628421
18/10/2023 10:08	0	53.7744301	-1.4628458
18/10/2023 10:08	0	53.7744571	-1.4628413
18/10/2023 10:08	0	53.7744841	-1.462844
18/10/2023 10:08	2	53.7745054	-1.4628486
18/10/2023 10:08	1	53.7745254	-1.4628611
18/10/2023 10:08	0	53.7745499	-1.4628741
18/10/2023 10:08	0	53.7745577	-1.4628748
18/10/2023 10:08	0	53.7745617	-1.4628843
18/10/2023 10:08	0	53.7745631	-1.4628875
18/10/2023 10:08	0	53.7745689	-1.46289

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:08	0	53.7745317	-1.4629536
18/10/2023 10:08	0	53.7745007	-1.4629465
18/10/2023 10:08	0	53.7744752	-1.462942
18/10/2023 10:09	3	53.7744506	-1.4629301
18/10/2023 10:09	0	53.7744261	-1.4629305
18/10/2023 10:09	0	53.7744034	-1.4629273
18/10/2023 10:09	0	53.7743787	-1.4629283
18/10/2023 10:09	0	53.7743521	-1.4629273
18/10/2023 10:09	0	53.7743232	-1.4629246
18/10/2023 10:09	0	53.7742927	-1.4629275
18/10/2023 10:09	0	53.7742624	-1.4629333
18/10/2023 10:09	0	53.7742361	-1.46294
18/10/2023 10:09	0	53.7742112	-1.4629275
18/10/2023 10:09	0	53.7741841	-1.4629173
18/10/2023 10:09	0	53.7741581	-1.4629133
18/10/2023 10:09	0	53.7741277	-1.4629093
18/10/2023 10:09	0	53.7740999	-1.4629095
18/10/2023 10:09	0	53.7740727	-1.4629053
18/10/2023 10:09	0	53.7740479	-1.462889
18/10/2023 10:09	0	53.7740161	-1.4628678
18/10/2023 10:09	0	53.7739881	-1.4628526
18/10/2023 10:09	0	53.7739597	-1.4628423
18/10/2023 10:09	0	53.7739512	-1.4628443
18/10/2023 10:10	0	53.7739524	-1.462844
18/10/2023 10:10	0	53.7739489	-1.4628371
18/10/2023 10:10	0	53.7739494	-1.462834
18/10/2023 10:10	0	53.7739412	-1.4628626
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18/10/2023 10:10	0	53.7739212	-1.4629188
18/10/2023 10:10	0	53.7739454	-1.462926
18/10/2023 10:10	0	53.7739697	-1.4629435
18/10/2023 10:10	0	53.7739846	-1.4629575
18/10/2023 10:10	0	53.7740022	-1.4629373
18/10/2023 10:10	2	53.7740296	-1.4629431
18/10/2023 10:10	0	53.7740621	-1.4629645
18/10/2023 10:10	0	53.7740846	-1.4629955
18/10/2023 10:10	0	53.7741114	-1.4630115
18/10/2023 10:10	0	53.7741301	-1.4630328
18/10/2023 10:10	0	53.7741597	-1.4630366
18/10/2023 10:10	0	53.7741881	-1.4630435
18/10/2023 10:10	0	53.7742164	-1.4630571
18/10/2023 10:10	0	53.7742529	-1.4630665
18/10/2023 10:10	0	53.7742822	-1.4630683
18/10/2023 10:11	0	53.7743034	-1.463072
18/10/2023 10:11	0	53.7743157	-1.4630833
18/10/2023 10:11	0	53.7743322	-1.4630925
18/10/2023 10:11	0	53.7743386	-1.463098
18/10/2023 10:11	0	53.7743604	-1.4630931
18/10/2023 10:11	1	53.7743776	-1.4630955
18/10/2023 10:11	0	53.7744094	-1.4630881
18/10/2023 10:11	0	53.7744266	-1.4630773
18/10/2023 10:11	0	53.7744539	-1.4630735
18/10/2023 10:11	0	53.7744916	-1.4630683
18/10/2023 10:11	0	53.7745154	-1.4630693
18/10/2023 10:11	0	53.7745382	-1.463082
18/10/2023 10:11	0	53.7745354	-1.463087
18/10/2023 10:11	0	53.7745341	-1.4630895
18/10/2023 10:11	0	53.7745351	-1.4630928
18/10/2023 10:11	0	53.7745309	-1.4631246
18/10/2023 10:11	0	53.7745239	-1.4631498
18/10/2023 10:11	3	53.7745082	-1.4631891
18/10/2023 10:11	0	53.7744922	-1.4631828
18/10/2023 10:11	0	53.7744717	-1.4631808
18/10/2023 10:12	0	53.7744486	-1.4631826
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18/10/2023 10:12	0	53.7743106	-1.4631581
18/10/2023 10:12	0	53.7742861	-1.4631525
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18/10/2023 10:12	0	53.7742324	-1.4631371
18/10/2023 10:12	0	53.7742026	-1.4631461
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18/10/2023 10:12	0	53.7741631	-1.4631598
18/10/2023 10:12	0	53.7741846	-1.4631975
18/10/2023 10:12	0	53.7742047	-1.4632138
18/10/2023 10:12	0	53.7742181	-1.463211
18/10/2023 10:12	0	53.7742422	-1.4632116
18/10/2023 10:12	0	53.7742659	-1.4632191
18/10/2023 10:12	0	53.7742892	-1.4632255
18/10/2023 10:13	0	53.7743094	-1.4632336
18/10/2023 10:13	0	53.7743419	-1.4632408
18/10/2023 10:13	0	53.7743711	-1.4632586
18/10/2023 10:13	0	53.7743922	-1.4632601
18/10/2023 10:13	0	53.7744162	-1.4632705
18/10/2023 10:13	0	53.7744462	-1.463274
18/10/2023 10:13	0	53.7744786	-1.4632821

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 10:13	0	53.7745024	-1.4632915
18/10/2023 10:13	0	53.7745217	-1.463298
18/10/2023 10:13	0	53.7745209	-1.463329
18/10/2023 10:13	0	53.7745122	-1.4633413
18/10/2023 10:13	0	53.7745049	-1.4633455
18/10/2023 10:13	0	53.7744837	-1.4633498
18/10/2023 10:13	0	53.7744512	-1.4633395
18/10/2023 10:13	0	53.7744232	-1.4633238
18/10/2023 10:13	0	53.7743982	-1.4633083
18/10/2023 10:13	0	53.7743922	-1.4633063
18/10/2023 10:13	3	53.7743936	-1.4633075
18/10/2023 10:13	0	53.7743926	-1.4633043
18/10/2023 10:13	0	53.7743876	-1.4632958
18/10/2023 10:14	0	53.7743647	-1.4632768
18/10/2023 10:14	0	53.7743371	-1.4632681
18/10/2023 10:14	0	53.7743086	-1.4632725
18/10/2023 10:14	0	53.7742892	-1.463271
18/10/2023 10:14	4	53.7742709	-1.4632845
18/10/2023 10:14	1	53.7742594	-1.463287
18/10/2023 10:14	0	53.7742587	-1.4632885
18/10/2023 10:14	0	53.7742599	-1.4632851
18/10/2023 10:14	0	53.7742491	-1.4632958
18/10/2023 10:14	0	53.7742209	-1.4633063
18/10/2023 10:14	0	53.7741909	-1.4633023
18/10/2023 10:14	0	53.7741709	-1.463317
18/10/2023 10:14	0	53.7741546	-1.4633278
18/10/2023 10:14	0	53.7741316	-1.4633493
18/10/2023 10:14	0	53.7741054	-1.463356
18/10/2023 10:14	0	53.7740881	-1.4633463
18/10/2023 10:14	0	53.7740781	-1.463306
18/10/2023 10:14	0	53.7740579	-1.4632858
18/10/2023 10:14	0	53.7740297	-1.4632773
18/10/2023 10:14	0	53.7740109	-1.4632676
18/10/2023 10:15	0	53.7739987	-1.46323
18/10/2023 10:15	0	53.7740072	-1.4631898
18/10/2023 10:15	0	53.7740117	-1.4631451
18/10/2023 10:15	0	53.7740051	-1.4630886
18/10/2023 10:15	1	53.7740162	-1.4630515
18/10/2023 10:15	0	53.7740272	-1.4630341
18/10/2023 10:15	0	53.7739971	-1.4630346
18/10/2023 10:15	0	53.7739704	-1.463026
18/10/2023 10:15	0	53.7739436	-1.4630261
18/10/2023 10:15	0	53.7739297	-1.4630431
18/10/2023 10:15	3	53.7739237	-1.4630828
18/10/2023 10:15	0	53.7739199	-1.4631111
18/10/2023 10:15	0	53.7739376	-1.4631268
18/10/2023 10:15	2	53.7739749	-1.4631368
18/10/2023 10:15	0	53.7739901	-1.4631616
18/10/2023 10:15	0	53.7740086	-1.4631711
18/10/2023 10:15	0	53.7740176	-1.4631803
18/10/2023 10:15	0	53.7740024	-1.4632198
18/10/2023 10:15	0	53.7739879	-1.4632661
18/10/2023 10:15	0	53.7739746	-1.4632973
18/10/2023 10:16	0	53.7739589	-1.4633028
18/10/2023 10:16	0	53.7739506	-1.4632996
18/10/2023 10:16	0	53.7739337	-1.4632908
18/10/2023 10:16	0	53.7739189	-1.4632846
18/10/2023 10:16	0	53.7739031	-1.4632885
18/10/2023 10:16	0	53.7739012	-1.463302
18/10/2023 10:16	0	53.7739071	-1.4633471
18/10/2023 10:16	0	53.7738959	-1.4633396
18/10/2023 10:16	0	53.7738794	-1.463421
18/10/2023 10:16	0	53.7738767	-1.4634323
18/10/2023 10:16	2	53.7738837	-1.4634465
18/10/2023 10:16	0	53.7739166	-1.4634558
18/10/2023 10:16	0	53.7739491	-1.4634691
18/10/2023 10:16	0	53.7739552	-1.4635005
18/10/2023 10:16	0	53.7739616	-1.4635086
18/10/2023 10:16	0	53.7739446	-1.4635081
18/10/2023 10:16	0	53.7739152	-1.4634978
18/10/2023 10:16	0	53.7738867	-1.4634908
18/10/2023 10:16	0	53.7738739	-1.4634915
18/10/2023 10:16	0	53.7738811	-1.4635188
18/10/2023 10:17	0	53.7738991	-1.4635251
18/10/2023 10:17	0	53.7739282	-1.463544
18/10/2023 10:17	0	53.7739561	-1.463552
18/10/2023 10:17	0	53.7739821	-1.4635511
18/10/2023 10:17	0	53.7740104	-1.4635515
18/10/2023 10:17	0	53.7740072	-1.4635426
18/10/2023 10:17	0	53.7740001	-1.463543
18/10/2023 10:17	0	53.7739864	-1.4635028
18/10/2023 10:17	0	53.7739764	-1.46345
18/10/2023 10:17	0	53.7739794	-1.4634095
18/10/2023 10:17	0	53.7739981	-1.4634065
18/10/2023 10:17	0	53.7740217	-1.4633956
18/10/2023 10:17	0	53.7740522	-1.4633853
18/10/2023 10:17	0	53.7740729	-1.4633745
18/10/2023 10:17	0	53.7740961	-1.463384
18/10/2023 10:17	0	53.7741176	-1.4633891
18/10/2023 10:17	0	53.7741177	-1.4633893
18/10/2023 10:17	0	53.7741409	-1.4633895
18/10/2023 10:17	0	53.7741634	-1.4633768
18/10/2023 10:17	0	53.7741741	-1.4633718

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:18	0	53.7741642	-1.4633668
18/10/2023 10:18	0	53.7741562	-1.4633648
18/10/2023 10:18	0	53.7741511	-1.4633656
18/10/2023 10:18	0	53.7741542	-1.4633688
18/10/2023 10:18	0	53.7741712	-1.4633745
18/10/2023 10:18	0	53.7742006	-1.4633843
18/10/2023 10:18	0	53.7742177	-1.4633985
18/10/2023 10:18	0	53.7742314	-1.4634123
18/10/2023 10:18	0	53.7742579	-1.4634141
18/10/2023 10:18	0	53.7742949	-1.4634221
18/10/2023 10:18	0	53.7743187	-1.4634256
18/10/2023 10:18	0	53.7743307	-1.463428
18/10/2023 10:18	0	53.7743484	-1.4634038
18/10/2023 10:18	0	53.7743669	-1.4633833
18/10/2023 10:18	0	53.7743821	-1.4633733
18/10/2023 10:18	0	53.7744079	-1.4633701
18/10/2023 10:18	0	53.7744397	-1.4633776
18/10/2023 10:18	0	53.7744684	-1.4633903
18/10/2023 10:18	0	53.7744949	-1.4633985
18/10/2023 10:19	0	53.7745102	-1.4634013
18/10/2023 10:19	0	53.7745169	-1.4634313
18/10/2023 10:19	0	53.7745162	-1.463483
18/10/2023 10:19	1	53.7745201	-1.4635213
18/10/2023 10:19	0	53.7745006	-1.4635343
18/10/2023 10:19	1	53.7744669	-1.4635303
18/10/2023 10:19	0	53.7744297	-1.463532
18/10/2023 10:19	0	53.7743962	-1.4635391
18/10/2023 10:19	0	53.7743561	-1.4635496
18/10/2023 10:19	0	53.7743206	-1.4635501
18/10/2023 10:19	0	53.7743061	-1.463571
18/10/2023 10:19	0	53.7743067	-1.4635933
18/10/2023 10:19	0	53.7743099	-1.4635783
18/10/2023 10:19	0	53.7743471	-1.4635778
18/10/2023 10:19	0	53.7743631	-1.463586
18/10/2023 10:19	0	53.7743782	-1.4635895
18/10/2023 10:19	0	53.7743997	-1.463584
18/10/2023 10:19	0	53.7744296	-1.4635766
18/10/2023 10:19	0	53.7744609	-1.4635696
18/10/2023 10:19	0	53.7744562	-1.4635823
18/10/2023 10:20	0	53.7744482	-1.4636308
18/10/2023 10:20	0	53.7744636	-1.4636671
18/10/2023 10:20	0	53.7744722	-1.4637091
18/10/2023 10:20	0	53.7744686	-1.4637156
18/10/2023 10:20	0	53.7744524	-1.4637135
18/10/2023 10:20	0	53.7744306	-1.4637048
18/10/2023 10:20	0	53.7744029	-1.4637068
18/10/2023 10:20	0	53.7743632	-1.4637025
18/10/2023 10:20	0	53.7743366	-1.4636858
18/10/2023 10:20	0	53.7743026	-1.46367
18/10/2023 10:20	0	53.7742731	-1.463658
18/10/2023 10:20	0	53.7742482	-1.4636393
18/10/2023 10:20	0	53.7742291	-1.4636323
18/10/2023 10:20	0	53.7742086	-1.4636283
18/10/2023 10:20	0	53.7741846	-1.4636223
18/10/2023 10:20	0	53.7741609	-1.4636108
18/10/2023 10:20	0	53.7741412	-1.4635976
18/10/2023 10:20	0	53.7741389	-1.4635901
18/10/2023 10:20	0	53.7741262	-1.4635786
18/10/2023 10:20	0	53.7741002	-1.4635665
18/10/2023 10:21	0	53.7740801	-1.4635525
18/10/2023 10:21	1	53.7740547	-1.4635378
18/10/2023 10:21	9	53.7740297	-1.4635263
18/10/2023 10:21	4	53.7740036	-1.463513
18/10/2023 10:21	0	53.7740059	-1.4635273
18/10/2023 10:21	0	53.7740039	-1.4635533
18/10/2023 10:21	0	53.7739872	-1.4635673
18/10/2023 10:21	0	53.7739871	-1.4635756
18/10/2023 10:21	0	53.7740051	-1.4635853
18/10/2023 10:21	0	53.7740076	-1.4635596
18/10/2023 10:21	0	53.7740209	-1.4635565
18/10/2023 10:21	0	53.7740396	-1.4635706
18/10/2023 10:21	0	53.7740669	-1.463594
18/10/2023 10:21	0	53.7740787	-1.4635998
18/10/2023 10:21	0	53.7740991	-1.4636011
18/10/2023 10:21	2	53.7741346	-1.4636281
18/10/2023 10:21	0	53.7741752	-1.4636423
18/10/2023 10:21	0	53.7741997	-1.46364
18/10/2023 10:21	0	53.7742147	-1.4636456
18/10/2023 10:21	0	53.7742199	-1.4636625
18/10/2023 10:22	0	53.7742266	-1.4636878
18/10/2023 10:22	0	53.7742307	-1.4637078
18/10/2023 10:22	0	53.7742534	-1.4637183
18/10/2023 10:22	0	53.7742831	-1.4637193
18/10/2023 10:22	0	53.7743119	-1.4637261
18/10/2023 10:22	0	53.7743399	-1.463731
18/10/2023 10:22	0	53.7743617	-1.4637355
18/10/2023 10:22	0	53.7743766	-1.4637423
18/10/2023 10:22	2	53.7743942	-1.4637495
18/10/2023 10:22	0	53.7744116	-1.4637533
18/10/2023 10:22	0	53.7744317	-1.4637588
18/10/2023 10:22	0	53.7744589	-1.4637548
18/10/2023 10:22	0	53.7744716	-1.4637696

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:22	0	53.7745084	-1.463764
18/10/2023 10:22	0	53.7745099	-1.4637821
18/10/2023 10:22	0	53.7745167	-1.4638153
18/10/2023 10:22	0	53.7745357	-1.4638421
18/10/2023 10:22	0	53.7745346	-1.4638488
18/10/2023 10:22	0	53.7745341	-1.4638466
18/10/2023 10:23	0	53.7745409	-1.4638416
18/10/2023 10:23	0	53.7745462	-1.4638416
18/10/2023 10:23	0	53.7745526	-1.4638388
18/10/2023 10:23	0	53.7745559	-1.4638423
18/10/2023 10:23	0	53.7745506	-1.4638801
18/10/2023 10:23	0	53.7745424	-1.4639113
18/10/2023 10:23	0	53.7745431	-1.463914
18/10/2023 10:23	0	53.7745519	-1.4638963
18/10/2023 10:23	0	53.7745574	-1.4638946
18/10/2023 10:23	0	53.7745597	-1.463901
18/10/2023 10:23	0	53.7745602	-1.4639103
18/10/2023 10:23	0	53.7745469	-1.463928
18/10/2023 10:23	0	53.7745474	-1.4639376
18/10/2023 10:23	0	53.7745461	-1.4639356
18/10/2023 10:23	0	53.7745487	-1.4639565
18/10/2023 10:23	0	53.7745531	-1.4639536
18/10/2023 10:23	0	53.7745584	-1.4639506
18/10/2023 10:23	0	53.7745567	-1.4639538
18/10/2023 10:23	0	53.7745602	-1.4639543
18/10/2023 10:23	0	53.7745554	-1.4639578
18/10/2023 10:24	0	53.7745539	-1.463961
18/10/2023 10:24	0	53.7745452	-1.4639431
18/10/2023 10:24	0	53.7745626	-1.4639255
18/10/2023 10:24	0	53.7745782	-1.4639028
18/10/2023 10:24	2	53.7745806	-1.4638761
18/10/2023 10:24	0	53.7745859	-1.463877
18/10/2023 10:24	0	53.7746042	-1.4638598
18/10/2023 10:24	0	53.7746132	-1.4638365
18/10/2023 10:24	0	53.7746234	-1.4637943
18/10/2023 10:24	0	53.7746274	-1.4637578
18/10/2023 10:24	0	53.7746264	-1.4637166
18/10/2023 10:24	0	53.7746231	-1.4636728
18/10/2023 10:24	0	53.7746286	-1.463642
18/10/2023 10:24	0	53.7746316	-1.4636008
18/10/2023 10:24	0	53.7746419	-1.4635521
18/10/2023 10:24	0	53.7746502	-1.4635095
18/10/2023 10:24	0	53.7746497	-1.4634611
18/10/2023 10:24	0	53.7746489	-1.4634075
18/10/2023 10:24	0	53.7746501	-1.4633626
18/10/2023 10:24	0	53.7746569	-1.4633191
18/10/2023 10:25	0	53.7746494	-1.4632663
18/10/2023 10:25	0	53.7746487	-1.4632038
18/10/2023 10:25	2	53.7746542	-1.4631418
18/10/2023 10:25	0	53.7746634	-1.4631126
18/10/2023 10:25	0	53.7746639	-1.4630965
18/10/2023 10:25	0	53.7746616	-1.4630998
18/10/2023 10:25	2	53.7746642	-1.4631053
18/10/2023 10:25	3	53.7746731	-1.463105
18/10/2023 10:25	0	53.7746721	-1.4630605
18/10/2023 10:25	0	53.7746731	-1.4630143
18/10/2023 10:25	0	53.7746779	-1.462982
18/10/2023 10:25	0	53.7746847	-1.4629388
18/10/2023 10:25	2	53.7746962	-1.4629035
18/10/2023 10:25	0	53.7747002	-1.462863
18/10/2023 10:25	1	53.7746997	-1.462808
18/10/2023 10:25	0	53.7747052	-1.4627515
18/10/2023 10:25	0	53.7747072	-1.4627026
18/10/2023 10:25	0	53.7747064	-1.4626566
18/10/2023 10:25	0	53.7747096	-1.462606
18/10/2023 10:25	0	53.7747084	-1.462555
18/10/2023 10:26	0	53.7747071	-1.4625113
18/10/2023 10:26	0	53.7747042	-1.4624645
18/10/2023 10:26	0	53.7747069	-1.4624223
18/10/2023 10:26	4	53.7747062	-1.4623778
18/10/2023 10:26	0	53.7747071	-1.4623385
18/10/2023 10:26	0	53.7747071	-1.462289
18/10/2023 10:26	0	53.7747131	-1.462247
18/10/2023 10:26	0	53.7747194	-1.4621918
18/10/2023 10:26	5	53.7747231	-1.4621411
18/10/2023 10:26	0	53.7747252	-1.462093
18/10/2023 10:26	0	53.7747262	-1.4620456
18/10/2023 10:26	0	53.7747266	-1.461996
18/10/2023 10:26	0	53.7747204	-1.4619538
18/10/2023 10:26	0	53.7747184	-1.4618943
18/10/2023 10:26	0	53.7747154	-1.4618541
18/10/2023 10:26	0	53.7747132	-1.4618018
18/10/2023 10:26	5	53.7747091	-1.461746
18/10/2023 10:26	0	53.7747104	-1.461695
18/10/2023 10:26	0	53.7747074	-1.4616471
18/10/2023 10:26	0	53.7747099	-1.4615936
18/10/2023 10:27	0	53.7747081	-1.4615396
18/10/2023 10:27	0	53.7747019	-1.4614853
18/10/2023 10:27	0	53.7747047	-1.4614365
18/10/2023 10:27	0	53.7747041	-1.4613823
18/10/2023 10:27	0	53.7747061	-1.461331
18/10/2023 10:27	0	53.7747116	-1.461293

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:27	0	53.7747234	-1.4612226
18/10/2023 10:27	0	53.7747324	-1.4611751
18/10/2023 10:27	0	53.7747434	-1.4611335
18/10/2023 10:27	0	53.7747526	-1.4610846
18/10/2023 10:27	0	53.7747609	-1.4610485
18/10/2023 10:27	0	53.7747689	-1.4610036
18/10/2023 10:27	0	53.7747841	-1.4609525
18/10/2023 10:27	0	53.7747967	-1.4609106
18/10/2023 10:27	0	53.7748102	-1.4608746
18/10/2023 10:27	0	53.7748157	-1.4608495
18/10/2023 10:27	0	53.7748141	-1.4608465
18/10/2023 10:27	0	53.7748099	-1.4608741
18/10/2023 10:27	0	53.7748057	-1.4608945
18/10/2023 10:28	0	53.7748082	-1.4609118
18/10/2023 10:28	2	53.7748116	-1.4609063
18/10/2023 10:28	0	53.7748132	-1.4608948
18/10/2023 10:28	0	53.7748151	-1.4609113
18/10/2023 10:28	2	53.7748367	-1.4609201
18/10/2023 10:28	19	53.7748591	-1.4608866
18/10/2023 10:28	0	53.7748569	-1.4608136
18/10/2023 10:28	0	53.7748657	-1.4607561
18/10/2023 10:28	0	53.7748802	-1.4607338
18/10/2023 10:28	0	53.7748852	-1.4607286
18/10/2023 10:28	0	53.7748846	-1.460729
18/10/2023 10:28	0	53.7748826	-1.4607305
18/10/2023 10:28	0	53.7748836	-1.4607226
18/10/2023 10:28	0	53.7748909	-1.4607235
18/10/2023 10:28	0	53.7749016	-1.4606953
18/10/2023 10:28	0	53.7749031	-1.4606811
18/10/2023 10:28	0	53.7749182	-1.4606413
18/10/2023 10:28	0	53.7749357	-1.4605933
18/10/2023 10:28	0	53.7749556	-1.4605565
18/10/2023 10:28	0	53.7749719	-1.4605098
18/10/2023 10:29	0	53.7749889	-1.460477
18/10/2023 10:29	0	53.7750069	-1.4604371
18/10/2023 10:29	0	53.7750272	-1.460392
18/10/2023 10:29	0	53.7750462	-1.4603535
18/10/2023 10:29	0	53.7750639	-1.4603091
18/10/2023 10:29	0	53.7750819	-1.4602598
18/10/2023 10:29	0	53.7750972	-1.4602143
18/10/2023 10:29	0	53.7751166	-1.4601868
18/10/2023 10:29	0	53.7751382	-1.4601503
18/10/2023 10:29	3	53.7751582	-1.4601108
18/10/2023 10:29	0	53.7751714	-1.4600721
18/10/2023 10:29	0	53.7751914	-1.4600331
18/10/2023 10:29	0	53.7752064	-1.4599978
18/10/2023 10:29	2	53.7752257	-1.4599628
18/10/2023 10:29	2	53.7752442	-1.4599083
18/10/2023 10:29	2	53.7752636	-1.4598531
18/10/2023 10:29	0	53.7752831	-1.4598186
18/10/2023 10:29	0	53.7753019	-1.4597821
18/10/2023 10:29	0	53.7753201	-1.4597456
18/10/2023 10:29	0	53.7753396	-1.4597048
18/10/2023 10:30	0	53.7753619	-1.4596601
18/10/2023 10:30	0	53.7753894	-1.459632
18/10/2023 10:30	0	53.7754106	-1.4595975
18/10/2023 10:30	0	53.7754359	-1.4595655
18/10/2023 10:30	0	53.7754577	-1.4595383
18/10/2023 10:30	2	53.7754842	-1.4595101
18/10/2023 10:30	0	53.7755091	-1.4594825
18/10/2023 10:30	0	53.7755324	-1.4594615
18/10/2023 10:30	0	53.7755581	-1.459428
18/10/2023 10:30	0	53.7755621	-1.4594015
18/10/2023 10:30	0	53.7755731	-1.4593965
18/10/2023 10:30	0	53.7755661	-1.4593913
18/10/2023 10:30	0	53.7755507	-1.4593701
18/10/2023 10:30	0	53.7755447	-1.4593673
18/10/2023 10:30	0	53.7755386	-1.4593573
18/10/2023 10:30	0	53.7755322	-1.4593551
18/10/2023 10:30	0	53.7755346	-1.4593708
18/10/2023 10:30	0	53.7755199	-1.4593981
18/10/2023 10:30	0	53.7754959	-1.4594218
18/10/2023 10:30	0	53.7754686	-1.4594515
18/10/2023 10:31	0	53.7754369	-1.4594936
18/10/2023 10:31	0	53.7754182	-1.4595286
18/10/2023 10:31	0	53.7753887	-1.459571
18/10/2023 10:31	0	53.7753689	-1.4596056
18/10/2023 10:31	0	53.7753502	-1.4596475
18/10/2023 10:31	0	53.7753274	-1.459693
18/10/2023 10:31	0	53.7752977	-1.4597123
18/10/2023 10:31	0	53.7752836	-1.4597625
18/10/2023 10:31	0	53.7752676	-1.4597715
18/10/2023 10:31	0	53.7752564	-1.4598035
18/10/2023 10:31	0	53.7752354	-1.4598186
18/10/2023 10:31	0	53.7752152	-1.4598645
18/10/2023 10:31	0	53.7751907	-1.4599031
18/10/2023 10:31	0	53.7751682	-1.4599576
18/10/2023 10:31	0	53.7751514	-1.4599806
18/10/2023 10:31	0	53.7751329	-1.4600233
18/10/2023 10:31	0	53.7751067	-1.4600516
18/10/2023 10:31	0	53.7750764	-1.4600643
18/10/2023 10:31	0	53.7750721	-1.4600745

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 10:31	0	53.7750651	-1.46009
18/10/2023 10:32	0	53.7750609	-1.4601028
18/10/2023 10:32	0	53.7750397	-1.460146
18/10/2023 10:32	0	53.7750247	-1.460178
18/10/2023 10:32	0	53.7750149	-1.4602071
18/10/2023 10:32	0	53.7750027	-1.4602433
18/10/2023 10:32	0	53.7749909	-1.460282
18/10/2023 10:32	0	53.7749689	-1.4603258
18/10/2023 10:32	0	53.7749451	-1.4603658
18/10/2023 10:32	0	53.7749304	-1.4604186
18/10/2023 10:32	0	53.7749107	-1.460444
18/10/2023 10:32	0	53.7748944	-1.4604981
18/10/2023 10:32	0	53.7748784	-1.4605306
18/10/2023 10:32	0	53.7748586	-1.4605801
18/10/2023 10:32	0	53.7748327	-1.4606208
18/10/2023 10:32	0	53.7748137	-1.4606463
18/10/2023 10:32	0	53.7748047	-1.4606508
18/10/2023 10:32	0	53.7747787	-1.4606698
18/10/2023 10:32	0	53.7747832	-1.4606675
18/10/2023 10:32	0	53.7747734	-1.4606916
18/10/2023 10:32	0	53.7747581	-1.4607383
18/10/2023 10:33	0	53.7747454	-1.4607926
18/10/2023 10:33	0	53.7747397	-1.4608226
18/10/2023 10:33	0	53.7747451	-1.460867
18/10/2023 10:33	0	53.7747494	-1.4609131
18/10/2023 10:33	0	53.7747406	-1.4609345
18/10/2023 10:33	0	53.7747249	-1.4609668
18/10/2023 10:33	0	53.7747131	-1.4609983
18/10/2023 10:33	0	53.7747111	-1.4610118
18/10/2023 10:33	0	53.7747132	-1.4610141
18/10/2023 10:33	0	53.7747167	-1.461015
18/10/2023 10:33	0	53.7747192	-1.461005
18/10/2023 10:33	0	53.7747181	-1.4610116
18/10/2023 10:33	3	53.7747136	-1.4610165
18/10/2023 10:33	0	53.7747172	-1.4610112
18/10/2023 10:33	3	53.7747172	-1.4610446
18/10/2023 10:33	0	53.7747112	-1.4610806
18/10/2023 10:33	0	53.7747042	-1.4611231
18/10/2023 10:33	0	53.7746981	-1.4611683
18/10/2023 10:33	0	53.7746864	-1.4612035
18/10/2023 10:33	0	53.7746762	-1.4612481
18/10/2023 10:34	0	53.7746659	-1.4612846
18/10/2023 10:34	0	53.7746694	-1.4613108
18/10/2023 10:34	0	53.7746771	-1.4613196
18/10/2023 10:34	0	53.7746816	-1.4613453
18/10/2023 10:34	0	53.7746829	-1.4613663
18/10/2023 10:34	0	53.7746844	-1.4613661
18/10/2023 10:34	0	53.7746877	-1.4613568
18/10/2023 10:34	0	53.7746811	-1.4613555
18/10/2023 10:34	0	53.7746724	-1.4613508
18/10/2023 10:34	0	53.7746707	-1.4613495
18/10/2023 10:34	0	53.7746836	-1.461341
18/10/2023 10:34	0	53.7746719	-1.461341
18/10/2023 10:34	0	53.7746734	-1.461345
18/10/2023 10:34	0	53.7746684	-1.4613458
18/10/2023 10:34	0	53.7746704	-1.4613621
18/10/2023 10:34	0	53.7746876	-1.461366
18/10/2023 10:34	0	53.7747066	-1.4613888
18/10/2023 10:34	0	53.7746986	-1.4614135
18/10/2023 10:34	0	53.7746946	-1.461464
18/10/2023 10:34	0	53.7746707	-1.4614843
18/10/2023 10:35	0	53.7746474	-1.461517
18/10/2023 10:35	0	53.7746332	-1.4615613
18/10/2023 10:35	0	53.7746321	-1.4616026
18/10/2023 10:35	0	53.7746352	-1.4616461
18/10/2023 10:35	0	53.7746339	-1.4616831
18/10/2023 10:35	0	53.7746344	-1.4617253
18/10/2023 10:35	0	53.7746329	-1.461776
18/10/2023 10:35	0	53.7746339	-1.4617975
18/10/2023 10:35	0	53.7746346	-1.4618516
18/10/2023 10:35	0	53.7746312	-1.461907
18/10/2023 10:35	0	53.7746292	-1.4619545
18/10/2023 10:35	0	53.7746184	-1.4619968
18/10/2023 10:35	0	53.7746114	-1.4620413
18/10/2023 10:35	0	53.7746081	-1.4620971
18/10/2023 10:35	0	53.7746052	-1.4621428
18/10/2023 10:35	0	53.7746014	-1.4621841
18/10/2023 10:35	0	53.7746017	-1.4622325
18/10/2023 10:35	0	53.7745967	-1.4622896
18/10/2023 10:35	0	53.7746069	-1.4623476
18/10/2023 10:35	0	53.7746076	-1.4623848
18/10/2023 10:36	0	53.7746082	-1.4624326
18/10/2023 10:36	0	53.7746051	-1.462478
18/10/2023 10:36	0	53.7746071	-1.4625241
18/10/2023 10:36	0	53.7746059	-1.4625661
18/10/2023 10:36	0	53.7746032	-1.4626088
18/10/2023 10:36	0	53.7746007	-1.4626511
18/10/2023 10:36	0	53.7745997	-1.4627031
18/10/2023 10:36	0	53.7745952	-1.4627516
18/10/2023 10:36	0	53.7746021	-1.4628018
18/10/2023 10:36	0	53.7746069	-1.462854
18/10/2023 10:36	0	53.7746099	-1.4629198
18/10/2023 10:36	0	53.7746076	-1.4629703

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:36	0	53.7746134	-1.463073
18/10/2023 10:36	2	53.7746011	-1.4631006
18/10/2023 10:36	0	53.7745942	-1.4631643
18/10/2023 10:36	0	53.7745871	-1.463217
18/10/2023 10:36	0	53.7745872	-1.4632561
18/10/2023 10:36	2	53.7745807	-1.4633103
18/10/2023 10:36	1	53.7745699	-1.4633666
18/10/2023 10:37	0	53.7745626	-1.463422
18/10/2023 10:37	0	53.7745564	-1.4634766
18/10/2023 10:37	0	53.7745566	-1.463539
18/10/2023 10:37	0	53.7745487	-1.4635946
18/10/2023 10:37	2	53.7745317	-1.4636363
18/10/2023 10:37	0	53.7745276	-1.4636786
18/10/2023 10:37	0	53.7745347	-1.4637181
18/10/2023 10:37	1	53.7745332	-1.463772
18/10/2023 10:37	0	53.7745412	-1.463808
18/10/2023 10:37	0	53.7745441	-1.4638558
18/10/2023 10:37	0	53.7745429	-1.4638623
18/10/2023 10:37	0	53.7745431	-1.463843
18/10/2023 10:37	0	53.7745429	-1.4638796
18/10/2023 10:37	0	53.7745496	-1.4639033
18/10/2023 10:37	0	53.7745404	-1.4639268
18/10/2023 10:37	0	53.7745457	-1.4639153
18/10/2023 10:37	0	53.7745477	-1.4639046
18/10/2023 10:37	0	53.7745489	-1.4638985
18/10/2023 10:37	0	53.7745514	-1.4638918
18/10/2023 10:37	0	53.7745231	-1.4638898
18/10/2023 10:38	0	53.7744912	-1.4638843
18/10/2023 10:38	0	53.7744587	-1.4638886
18/10/2023 10:38	0	53.7744257	-1.463873
18/10/2023 10:38	0	53.7743924	-1.4638568
18/10/2023 10:38	0	53.7743701	-1.463854
18/10/2023 10:38	0	53.7743581	-1.4638348
18/10/2023 10:38	0	53.7743592	-1.4637833
18/10/2023 10:38	0	53.7743586	-1.463748
18/10/2023 10:38	0	53.7743666	-1.4637233
18/10/2023 10:38	0	53.7743724	-1.4637001
18/10/2023 10:38	0	53.7743846	-1.4636438
18/10/2023 10:38	0	53.7743932	-1.4635946
18/10/2023 10:38	0	53.7744041	-1.4635175
18/10/2023 10:38	0	53.7744101	-1.4634511
18/10/2023 10:38	0	53.7744214	-1.4634178
18/10/2023 10:38	0	53.7744262	-1.4633758
18/10/2023 10:38	2	53.7744317	-1.4633403
18/10/2023 10:38	0	53.7744122	-1.463342
18/10/2023 10:38	0	53.7744084	-1.4633421
18/10/2023 10:38	0	53.7743946	-1.4633298
18/10/2023 10:39	0	53.7743639	-1.4632898
18/10/2023 10:39	0	53.7743371	-1.4632446
18/10/2023 10:39	0	53.7743146	-1.4631936
18/10/2023 10:39	0	53.7742911	-1.4631585
18/10/2023 10:39	0	53.7742791	-1.4631115
18/10/2023 10:39	0	53.7742709	-1.4630638
18/10/2023 10:39	0	53.7742647	-1.4630135
18/10/2023 10:39	0	53.7742699	-1.462973
18/10/2023 10:39	0	53.7742679	-1.4629143
18/10/2023 10:39	0	53.7742654	-1.4628616
18/10/2023 10:39	16	53.7742664	-1.4628328
18/10/2023 10:39	0	53.7742631	-1.462787
18/10/2023 10:39	11	53.7742661	-1.4627941
18/10/2023 10:39	0	53.7742632	-1.4627886
18/10/2023 10:39	0	53.7742616	-1.4627845
18/10/2023 10:39	0	53.7742544	-1.4627778
18/10/2023 10:39	0	53.7742492	-1.462761
18/10/2023 10:39	0	53.7742467	-1.4627128
18/10/2023 10:39	0	53.7742447	-1.4626708
18/10/2023 10:39	0	53.7742622	-1.462631
18/10/2023 10:40	0	53.7742769	-1.4625856
18/10/2023 10:40	0	53.7742869	-1.462535
18/10/2023 10:40	2	53.7742862	-1.462512
18/10/2023 10:40	0	53.7742744	-1.4625068
18/10/2023 10:40	0	53.7742754	-1.4625056
18/10/2023 10:40	0	53.7742752	-1.4624845
18/10/2023 10:40	0	53.7742761	-1.462482
18/10/2023 10:40	0	53.7742776	-1.4624966
18/10/2023 10:40	0	53.7742907	-1.4624843
18/10/2023 10:40	0	53.7742991	-1.4624381
18/10/2023 10:40	2	53.7743027	-1.4623961
18/10/2023 10:40	0	53.7743047	-1.4623463
18/10/2023 10:40	0	53.7743039	-1.4623055
18/10/2023 10:40	0	53.7743031	-1.4622473
18/10/2023 10:40	0	53.7743042	-1.4621946
18/10/2023 10:40	0	53.7743071	-1.4621398
18/10/2023 10:40	0	53.7743151	-1.4620968
18/10/2023 10:40	1	53.7743221	-1.4620553
18/10/2023 10:40	0	53.7743244	-1.4620073
18/10/2023 10:40	0	53.7743349	-1.4619486
18/10/2023 10:41	0	53.7743462	-1.4619136
18/10/2023 10:41	0	53.7743539	-1.4618666
18/10/2023 10:41	0	53.7743652	-1.4618275
18/10/2023 10:41	0	53.7743684	-1.4617796
18/10/2023 10:41	0	53.7743717	-1.4617306

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:41	0	53.7743712	-1.461646
18/10/2023 10:41	0	53.7743697	-1.461614
18/10/2023 10:41	0	53.7743567	-1.4615998
18/10/2023 10:41	0	53.7743251	-1.4615781
18/10/2023 10:41	0	53.7743036	-1.4615535
18/10/2023 10:41	0	53.7742647	-1.4615251
18/10/2023 10:41	0	53.7742382	-1.4614978
18/10/2023 10:41	3	53.7742276	-1.4614616
18/10/2023 10:41	2	53.7742384	-1.4614028
18/10/2023 10:41	0	53.7742482	-1.4613463
18/10/2023 10:41	0	53.7742517	-1.4613045
18/10/2023 10:41	0	53.7742566	-1.4612656
18/10/2023 10:41	0	53.7742714	-1.461248
18/10/2023 10:41	0	53.7742966	-1.4612566
18/10/2023 10:42	0	53.7743281	-1.4612643
18/10/2023 10:42	0	53.7743506	-1.4612733
18/10/2023 10:42	0	53.7743746	-1.4612703
18/10/2023 10:42	0	53.7743826	-1.4612483
18/10/2023 10:42	0	53.7743949	-1.461206
18/10/2023 10:42	0	53.7744071	-1.4611546
18/10/2023 10:42	0	53.7744217	-1.4611093
18/10/2023 10:42	0	53.7744417	-1.4610761
18/10/2023 10:42	0	53.7744531	-1.4610313
18/10/2023 10:42	0	53.7744624	-1.4609756
18/10/2023 10:42	1	53.7744769	-1.4609266
18/10/2023 10:42	0	53.7744931	-1.4608763
18/10/2023 10:42	0	53.7745031	-1.460831
18/10/2023 10:42	0	53.7745162	-1.4607838
18/10/2023 10:42	0	53.7745292	-1.4607301
18/10/2023 10:42	0	53.7745429	-1.4606853
18/10/2023 10:42	0	53.7745507	-1.4606496
18/10/2023 10:42	0	53.7745559	-1.46061
18/10/2023 10:42	0	53.7745506	-1.4605671
18/10/2023 10:42	0	53.7745521	-1.4605536
18/10/2023 10:43	0	53.7745652	-1.46053
18/10/2023 10:43	0	53.7745624	-1.4604915
18/10/2023 10:43	0	53.7745541	-1.4604881
18/10/2023 10:43	0	53.7745392	-1.4604428
18/10/2023 10:43	0	53.7745419	-1.4603975
18/10/2023 10:43	2	53.7745442	-1.4603383
18/10/2023 10:43	0	53.7745429	-1.46028
18/10/2023 10:43	0	53.7745442	-1.460227
18/10/2023 10:43	0	53.7745382	-1.4601638
18/10/2023 10:43	0	53.7745274	-1.4601203
18/10/2023 10:43	0	53.7744999	-1.4600935
18/10/2023 10:43	0	53.7744697	-1.4600498
18/10/2023 10:43	0	53.7744482	-1.4600376
18/10/2023 10:43	2	53.7744321	-1.4600155
18/10/2023 10:43	0	53.7744186	-1.4599995
18/10/2023 10:43	0	53.7744116	-1.4599846
18/10/2023 10:43	0	53.7744026	-1.4599768
18/10/2023 10:43	0	53.7743861	-1.4599601
18/10/2023 10:43	0	53.7743732	-1.45994
18/10/2023 10:43	0	53.7743762	-1.4599445
18/10/2023 10:44	0	53.7743579	-1.4599818
18/10/2023 10:44	0	53.7743326	-1.4600315
18/10/2023 10:44	0	53.7743239	-1.4600645
18/10/2023 10:44	0	53.7743177	-1.4600865
18/10/2023 10:44	0	53.7743107	-1.4601185
18/10/2023 10:44	0	53.7742974	-1.460162
18/10/2023 10:44	0	53.7742886	-1.4602148
18/10/2023 10:44	4	53.7742767	-1.4602638
18/10/2023 10:44	0	53.7742692	-1.4603121
18/10/2023 10:44	0	53.7742564	-1.4603463
18/10/2023 10:44	0	53.7742447	-1.4603806
18/10/2023 10:44	0	53.7742391	-1.460427
18/10/2023 10:44	0	53.7742309	-1.460472
18/10/2023 10:44	0	53.7742271	-1.460513
18/10/2023 10:44	0	53.7742241	-1.460562
18/10/2023 10:44	0	53.7742282	-1.4606128
18/10/2023 10:44	0	53.7742244	-1.46066
18/10/2023 10:44	0	53.7742122	-1.4607133
18/10/2023 10:44	3	53.7742039	-1.4607523
18/10/2023 10:44	0	53.7741991	-1.4607831
18/10/2023 10:45	0	53.7741984	-1.4608268
18/10/2023 10:45	0	53.7741972	-1.4608663
18/10/2023 10:45	0	53.7741916	-1.4608766
18/10/2023 10:45	0	53.7741846	-1.4609188
18/10/2023 10:45	0	53.7741821	-1.4609681
18/10/2023 10:45	0	53.7741779	-1.4610155
18/10/2023 10:45	0	53.7741619	-1.4610643
18/10/2023 10:45	0	53.7741584	-1.461102
18/10/2023 10:45	0	53.7741444	-1.4611593
18/10/2023 10:45	0	53.7741262	-1.4612053
18/10/2023 10:45	0	53.7741174	-1.4612541
18/10/2023 10:45	0	53.7741157	-1.4613031
18/10/2023 10:45	0	53.7741146	-1.4613633
18/10/2023 10:45	0	53.7741136	-1.4614108
18/10/2023 10:45	0	53.7741097	-1.4614685
18/10/2023 10:45	0	53.7741032	-1.4615286
18/10/2023 10:45	0	53.7741051	-1.4615963
18/10/2023 10:45	0	53.7741037	-1.4616525

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:45	0	53.7740951	-1.4617563
18/10/2023 10:46	0	53.7740896	-1.4618025
18/10/2023 10:46	9	53.7740874	-1.4618646
18/10/2023 10:46	23	53.7740734	-1.4619003
18/10/2023 10:46	0	53.7740729	-1.4619521
18/10/2023 10:46	0	53.7740661	-1.4620011
18/10/2023 10:46	0	53.7740601	-1.4620568
18/10/2023 10:46	0	53.7740551	-1.4621013
18/10/2023 10:46	0	53.7740437	-1.4621545
18/10/2023 10:46	0	53.7740377	-1.4622023
18/10/2023 10:46	0	53.7740307	-1.462252
18/10/2023 10:46	0	53.7740294	-1.4623045
18/10/2023 10:46	0	53.7740206	-1.462351
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18/10/2023 10:46	0	53.7740044	-1.4624918
18/10/2023 10:46	0	53.7740011	-1.4625441
18/10/2023 10:46	0	53.7739992	-1.4625961
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18/10/2023 10:46	0	53.7739721	-1.4626556
18/10/2023 10:46	2	53.7739614	-1.4626973
18/10/2023 10:47	0	53.7739711	-1.4627445
18/10/2023 10:47	0	53.7739664	-1.4627886
18/10/2023 10:47	0	53.7739614	-1.4628406
18/10/2023 10:47	0	53.7739477	-1.4628895
18/10/2023 10:47	0	53.7739356	-1.4629376
18/10/2023 10:47	0	53.7739242	-1.4629895
18/10/2023 10:47	0	53.7739206	-1.463042
18/10/2023 10:47	0	53.7739152	-1.4630871
18/10/2023 10:47	0	53.7739084	-1.4631326
18/10/2023 10:47	2	53.7739027	-1.4631793
18/10/2023 10:47	0	53.7738934	-1.463234
18/10/2023 10:47	0	53.7738847	-1.4632828
18/10/2023 10:47	0	53.7738802	-1.4633351
18/10/2023 10:47	0	53.7738732	-1.4633845
18/10/2023 10:47	0	53.7738677	-1.4634363
18/10/2023 10:47	0	53.7738672	-1.4634806
18/10/2023 10:47	0	53.7738647	-1.4635288
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18/10/2023 10:47	0	53.7738971	-1.4635921
18/10/2023 10:47	0	53.7739241	-1.4636125
18/10/2023 10:48	0	53.7739549	-1.4636453
18/10/2023 10:48	0	53.7739886	-1.4636685
18/10/2023 10:48	0	53.7740212	-1.4636861
18/10/2023 10:48	0	53.7740506	-1.4636985
18/10/2023 10:48	0	53.7740844	-1.463722
18/10/2023 10:48	0	53.7741136	-1.463745
18/10/2023 10:48	0	53.7741466	-1.4637665
18/10/2023 10:48	0	53.7741824	-1.4637823
18/10/2023 10:48	0	53.7742112	-1.463789
18/10/2023 10:48	0	53.7742377	-1.463794
18/10/2023 10:48	0	53.7742711	-1.4637955
18/10/2023 10:48	0	53.7743069	-1.4638038
18/10/2023 10:48	0	53.7743416	-1.463818
18/10/2023 10:48	0	53.7743741	-1.463839
18/10/2023 10:48	0	53.7743999	-1.4638545
18/10/2023 10:48	0	53.7744356	-1.4638776
18/10/2023 10:48	0	53.7744672	-1.4638975
18/10/2023 10:48	0	53.7744934	-1.4638958
18/10/2023 10:48	0	53.7745104	-1.4639021
18/10/2023 10:48	0	53.7745147	-1.4639056
18/10/2023 10:49	0	53.7745166	-1.4639031
18/10/2023 10:49	0	53.7745236	-1.463897
18/10/2023 10:49	0	53.7745242	-1.4638966
18/10/2023 10:49	0	53.7745259	-1.4638971
18/10/2023 10:49	0	53.7745226	-1.4639
18/10/2023 10:49	0	53.7745202	-1.463903
18/10/2023 10:49	0	53.7745196	-1.4639025
18/10/2023 10:49	0	53.7745174	-1.4639055
18/10/2023 10:49	0	53.7745157	-1.4639086
18/10/2023 10:49	0	53.7745162	-1.4639108
18/10/2023 10:49	0	53.7745149	-1.4639103
18/10/2023 10:49	0	53.7745177	-1.4639093
18/10/2023 10:49	0	53.7745211	-1.4639055
18/10/2023 10:49	0	53.7745286	-1.4639025
18/10/2023 10:49	0	53.7745292	-1.463902
18/10/2023 10:49	0	53.7745289	-1.4639008
18/10/2023 10:49	0	53.7745296	-1.4639013
18/10/2023 10:49	0	53.7745286	-1.4639036
18/10/2023 10:49	0	53.7745277	-1.463908
18/10/2023 10:49	0	53.7745292	-1.46391
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18/10/2023 10:50	0	53.7745286	-1.4639088
18/10/2023 10:50	0	53.7745292	-1.46391
18/10/2023 10:50	0	53.7745297	-1.4639048
18/10/2023 10:50	2	53.7745272	-1.4639065
18/10/2023 10:50	0	53.7745259	-1.4639035
18/10/2023 10:50	0	53.7745264	-1.4639048
18/10/2023 10:50	0	53.7745276	-1.4639038
18/10/2023 10:50	0	53.7745266	-1.4639025
18/10/2023 10:50	0	53.7745271	-1.4638993

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:44	0	53.7738369	-1.4658811
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18/10/2023 10:44	0	53.7736794	-1.4657166
18/10/2023 10:44	0	53.7736681	-1.4657103
18/10/2023 10:44	0	53.7735999	-1.4656668
18/10/2023 10:44	0	53.7735954	-1.465648
18/10/2023 10:44	0	53.7735954	-1.465648
18/10/2023 10:44	0	53.7735091	-1.4655986
18/10/2023 10:44	0	53.7735091	-1.4655986
18/10/2023 10:44	0	53.7735091	-1.4655986
18/10/2023 10:44	0	53.7734349	-1.4655311
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18/10/2023 10:45	0	53.7733061	-1.4654621
18/10/2023 10:45	0	53.7733061	-1.4654621
18/10/2023 10:45	0	53.7732517	-1.465422
18/10/2023 10:45	0	53.7732442	-1.4654401
18/10/2023 10:45	0	53.7732404	-1.4654415
18/10/2023 10:45	0	53.7732404	-1.4654415
18/10/2023 10:45	0	53.7732404	-1.4654415
18/10/2023 10:45	0	53.7732404	-1.4654415
18/10/2023 10:45	0	53.7731966	-1.4653668
18/10/2023 10:45	0	53.7731966	-1.4653668
18/10/2023 10:45	0	53.7731122	-1.4653003
18/10/2023 10:45	0	53.7731122	-1.4653003
18/10/2023 10:45	0	53.7730529	-1.4652243
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18/10/2023 10:46	0	53.7730529	-1.4652243
18/10/2023 10:46	0	53.7729566	-1.4651516
18/10/2023 10:46	2	53.7728941	-1.4651555
18/10/2023 10:46	0	53.7728837	-1.4651576
18/10/2023 10:46	0	53.7728837	-1.4651576
18/10/2023 10:46	0	53.7728837	-1.4651576
18/10/2023 10:46	0	53.7727692	-1.4651615
18/10/2023 10:46	0	53.7727692	-1.4651615
18/10/2023 10:46	0	53.7727692	-1.4651615
18/10/2023 10:46	0	53.7726604	-1.4651131
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18/10/2023 10:46	0	53.7724997	-1.4650235
18/10/2023 10:46	0	53.7724997	-1.4650235
18/10/2023 10:46	0	53.7724124	-1.4649801
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18/10/2023 10:46	0	53.7723619	-1.4649231
18/10/2023 10:47	0	53.7723619	-1.4649231
18/10/2023 10:47	0	53.7723619	-1.4649231
18/10/2023 10:47	0	53.7723022	-1.4648448
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18/10/2023 10:47	0	53.7719819	-1.464678
18/10/2023 10:47	0	53.7719819	-1.464678
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18/10/2023 10:47	0	53.7719077	-1.4647981
18/10/2023 10:47	0	53.7719077	-1.4647981
18/10/2023 10:48	0	53.7719077	-1.4647981
18/10/2023 10:48	0	53.7718184	-1.4648635
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18/10/2023 10:48	0	53.7717742	-1.464905
18/10/2023 10:48	0	53.7717737	-1.4649178
18/10/2023 10:48	0	53.7717017	-1.4649046
18/10/2023 10:48	0	53.7716949	-1.4649048
18/10/2023 10:48	0	53.7716949	-1.4649048
18/10/2023 10:48	0	53.7716326	-1.4648966
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18/10/2023 10:48	0	53.7715649	-1.4649123
18/10/2023 10:48	0	53.7715649	-1.4649123
18/10/2023 10:48	0	53.7715064	-1.4649228
18/10/2023 10:48	0	53.7714977	-1.4649175
18/10/2023 10:48	0	53.7714611	-1.4648878
18/10/2023 10:48	0	53.7714611	-1.4648878
18/10/2023 10:48	0	53.7714014	-1.4648491
18/10/2023 10:48	0	53.7713762	-1.464849
18/10/2023 10:48	0	53.7713756	-1.4648451
18/10/2023 10:49	0	53.7713756	-1.4648451
18/10/2023 10:49	0	53.7713042	-1.4648345

Date and Time	CH ppm	Latitude	Longitude
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18/10/2023 10:49	0	53.7712049	-1.4647775
18/10/2023 10:49	0	53.7711577	-1.4647483
18/10/2023 10:49	0	53.7711657	-1.464758
18/10/2023 10:49	0	53.7711267	-1.4647835
18/10/2023 10:49	0	53.7711236	-1.4647856
18/10/2023 10:49	0	53.7711236	-1.4647856
18/10/2023 10:49	0	53.7710922	-1.4647393
18/10/2023 10:49	0	53.7710892	-1.4647425
18/10/2023 10:49	0	53.7710892	-1.4647425
18/10/2023 10:49	0	53.7710892	-1.4647425
18/10/2023 10:49	6	53.7709962	-1.4647316
18/10/2023 10:49	6	53.7709962	-1.4647316
18/10/2023 10:49	5	53.7709561	-1.4646955
18/10/2023 10:49	3	53.7709561	-1.4646955
18/10/2023 10:50	1	53.7709062	-1.4646763
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18/10/2023 10:50	0	53.7708622	-1.4646855
18/10/2023 10:50	0	53.7707354	-1.4647055
18/10/2023 10:50	0	53.7707099	-1.4646948
18/10/2023 10:50	0	53.7706956	-1.464726
18/10/2023 10:50	0	53.7706956	-1.464726
18/10/2023 10:50	0	53.7706656	-1.4646965
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18/10/2023 10:50	0	53.7705939	-1.4646695
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18/10/2023 10:53	0	53.7708991	-1.464472
18/10/2023 10:53	0	53.7708991	-1.464472
18/10/2023 10:53	0	53.7709624	-1.464426
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18/10/2023 10:53	0	53.7709764	-1.4644381
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18/10/2023 10:53	0	53.7710132	-1.4644096
18/10/2023 10:53	0	53.7710132	-1.4644096
18/10/2023 10:53	0	53.7710701	-1.4644623
18/10/2023 10:53	0	53.7710701	-1.4644623

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 10:53	0	53.7711154	-1.4644521
18/10/2023 10:53	0	53.7711154	-1.4644521
18/10/2023 10:53	0	53.7711202	-1.4644586
18/10/2023 10:53	0	53.7711614	-1.4644526
18/10/2023 10:54	0	53.7711747	-1.4644485
18/10/2023 10:54	0	53.7712331	-1.464417
18/10/2023 10:54	0	53.7713202	-1.4643821
18/10/2023 10:54	0	53.7713434	-1.4643793
18/10/2023 10:54	0	53.7714071	-1.4643973
18/10/2023 10:54	0	53.7714712	-1.4644015
18/10/2023 10:54	0	53.7714911	-1.4643993
18/10/2023 10:54	0	53.7715806	-1.4644075
18/10/2023 10:54	0	53.7715806	-1.4644075
18/10/2023 10:54	0	53.7716667	-1.4644236
18/10/2023 10:54	0	53.7717122	-1.4644443
18/10/2023 10:54	0	53.7717219	-1.4644546
18/10/2023 10:54	0	53.7717692	-1.4644808
18/10/2023 10:54	0	53.7718236	-1.4645258
18/10/2023 10:54	0	53.7718236	-1.4645258
18/10/2023 10:54	0	53.7719001	-1.4645838
18/10/2023 10:54	0	53.7719574	-1.4646235
18/10/2023 10:54	0	53.7719574	-1.4646235
18/10/2023 10:54	0	53.7720352	-1.4646643
18/10/2023 10:54	0	53.7720742	-1.4647131
18/10/2023 10:55	0	53.7720742	-1.4647131
18/10/2023 10:55	0	53.7721187	-1.464736
18/10/2023 10:55	0	53.7721187	-1.464736
18/10/2023 10:55	0	53.7721704	-1.4647461
18/10/2023 10:55	0	53.7722066	-1.4647576
18/10/2023 10:55	0	53.7722119	-1.4647618
18/10/2023 10:55	0	53.7722432	-1.4647808
18/10/2023 10:55	0	53.7722506	-1.4647836
18/10/2023 10:55	0	53.7722957	-1.4647871
18/10/2023 10:55	0	53.7723032	-1.4647923
18/10/2023 10:55	0	53.7723359	-1.4648068
18/10/2023 10:55	0	53.7723359	-1.4648068
18/10/2023 10:55	0	53.7723704	-1.464838
18/10/2023 10:55	0	53.7723704	-1.464838
18/10/2023 10:55	0	53.7724396	-1.4648668
18/10/2023 10:55	0	53.7724566	-1.4648693
18/10/2023 10:55	0	53.7724566	-1.4648693
18/10/2023 10:55	0	53.7724752	-1.464886
18/10/2023 10:55	0	53.7724752	-1.464886
18/10/2023 10:55	0	53.7724681	-1.4648336
18/10/2023 10:56	0	53.7724794	-1.4648401
18/10/2023 10:56	0	53.7724826	-1.464825
18/10/2023 10:56	0	53.7724882	-1.4648273
18/10/2023 10:56	0	53.7724882	-1.4648273
18/10/2023 10:56	0	53.7725124	-1.4648361
18/10/2023 10:56	0	53.7725124	-1.4648361
18/10/2023 10:56	0	53.7725124	-1.4648361
18/10/2023 10:56	0	53.7725587	-1.4648783
18/10/2023 10:56	0	53.7726942	-1.464929
18/10/2023 10:56	0	53.7728569	-1.4650015
18/10/2023 10:56	0	53.7729939	-1.4650558
18/10/2023 10:56	0	53.7731144	-1.4651015
18/10/2023 10:56	0	53.7732149	-1.4651331
18/10/2023 10:56	0	53.7733091	-1.4651461
18/10/2023 10:56	0	53.7733939	-1.4651533
18/10/2023 10:56	0	53.7734696	-1.4651488
18/10/2023 10:56	0	53.7735367	-1.4651445
18/10/2023 10:56	0	53.7736106	-1.4651505
18/10/2023 10:56	0	53.7736637	-1.4651351
18/10/2023 10:56	0	53.7737042	-1.4651278
18/10/2023 10:57	0	53.7737456	-1.4651226
18/10/2023 10:57	0	53.7737876	-1.465125
18/10/2023 10:57	0	53.7738141	-1.4651275
18/10/2023 10:57	0	53.7738337	-1.4651253
18/10/2023 10:57	0	53.7738766	-1.4651525
18/10/2023 10:57	0	53.7739082	-1.4651553
18/10/2023 10:57	0	53.7739289	-1.465142
18/10/2023 10:57	0	53.7739394	-1.465117
18/10/2023 10:57	0	53.7739887	-1.4651786
18/10/2023 10:57	0	53.7740359	-1.465195
18/10/2023 10:57	0	53.7740824	-1.4652073
18/10/2023 10:57	0	53.7741387	-1.4652201
18/10/2023 10:57	0	53.7741672	-1.4652088
18/10/2023 10:57	0	53.7741789	-1.4652131
18/10/2023 10:57	0	53.7741969	-1.4652081
18/10/2023 10:57	0	53.7742207	-1.4652021
18/10/2023 10:57	0	53.7742486	-1.4652008
18/10/2023 10:57	0	53.7742699	-1.4651873
18/10/2023 10:57	0	53.7743059	-1.4651833
18/10/2023 10:57	0	53.7743306	-1.4651698
18/10/2023 10:58	0	53.7743376	-1.465157
18/10/2023 10:58	0	53.7743376	-1.465157
18/10/2023 10:58	0	53.7743376	-1.465157
18/10/2023 10:58	0	53.7743376	-1.465157
18/10/2023 10:58	0	53.7744324	-1.4651221
18/10/2023 10:58	0	53.7744502	-1.4650946
18/10/2023 10:58	0	53.7744486	-1.4651008
18/10/2023 10:58	0	53.7744486	-1.4651008
18/10/2023 10:58	0	53.7744486	-1.4651008

Date and Time	CH ppm	Latitude	Longitude
18/10/2023 11:40	0	53.7741889	-1.4650811
18/10/2023 11:40	0	53.7741889	-1.4650811
18/10/2023 11:40	0	53.7741889	-1.4650811
18/10/2023 11:40	0	53.7741809	-1.4649193
18/10/2023 11:40	0	53.7741796	-1.4649011
18/10/2023 11:40	0	53.7741796	-1.4649011
18/10/2023 11:40	0	53.7741796	-1.4649011
18/10/2023 11:40	0	53.7741796	-1.4649011
18/10/2023 11:40	0	53.7741796	-1.4649011
18/10/2023 11:41	0	53.7741796	-1.4649011
18/10/2023 11:41	0	53.7741796	-1.4649011
18/10/2023 11:41	0	53.7741796	-1.4649011
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7741556	-1.464709
18/10/2023 11:41	0	53.7742261	-1.464553
18/10/2023 11:41	0	53.7742261	-1.464553
18/10/2023 11:41	0	53.7742261	-1.464553
18/10/2023 11:41	0	53.7742261	-1.464553
18/10/2023 11:42	0	53.7743064	-1.4644603
18/10/2023 11:42	0	53.7743064	-1.4644603
18/10/2023 11:42	0	53.7743064	-1.4644603
18/10/2023 11:42	0	53.7743064	-1.4644603
18/10/2023 11:42	0	53.7743064	-1.4644603
18/10/2023 11:42	0	53.7743876	-1.4643076
18/10/2023 11:42	0	53.7743876	-1.4643076
18/10/2023 11:42	0	53.7743876	-1.4643076
18/10/2023 11:42	0	53.7743876	-1.4643076
18/10/2023 11:42	0	53.7744487	-1.4641838
18/10/2023 11:42	0	53.7744487	-1.4641838
18/10/2023 11:42	0	53.7744487	-1.4641838
18/10/2023 11:42	0	53.7744487	-1.4641838
18/10/2023 11:42	0	53.7744799	-1.464021
18/10/2023 11:42	0	53.7744809	-1.4640051
18/10/2023 11:42	0	53.7744809	-1.4640051
18/10/2023 11:42	0	53.7744809	-1.4640051
18/10/2023 11:42	0	53.7744809	-1.4640051
18/10/2023 11:42	0	53.7744809	-1.4640051
18/10/2023 11:43	0	53.7744809	-1.4640051
18/10/2023 11:43	0	53.7745612	-1.4639185
18/10/2023 11:43	0	53.7745626	-1.4639156
18/10/2023 11:43	0	53.7745626	-1.4639156
18/10/2023 11:43	0	53.7745626	-1.4639156

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix G

Laboratory certificates

Ground Gas Solutions
Pythia House (Unit 10)
Bamford Business Park
Hibbert Street
Stockport
United Kingdom
SK4 1PL



Attention : Emily Callaghan
Date : 31st October, 2023
Your reference : GGS 3070
Our reference : Test Report 23/17500 Batch 1
Location : Skelton Grange Phase 2A
Date samples received : 20th October, 2023
Status : Final Report
Issue : 1

Two samples were received for analysis on 20th October, 2023 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.29 kg of CO2

Scope 1&2&3 emissions - 0.684 kg of CO2

Authorised By:

Liza Klebe

Project Co-ordinator

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/17500

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 23/17500

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM25	Determinaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determinaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix H

Equipment Calibration Certificates

CALIBRATION CERTIFICATE:



Certificate ref.	CGDTCAL_
Issued By:	CGD Technology Limited
Date:	14/09/2023
Staff:	Varghese Abraham
Instrument:	GasClam
Serial Number:	41908

✓ ✓
0

Calibration Results			
Sensor	Lot No.	Reference Value	Indicated Value
Hydrogen sulphide	C24438	124	119
Carbon monoxide	C22238	42	43
Methane	C322626	58.82	58.4
Carbon dioxide	C322626	41.18	41.7
Oxygen	C322626	0	0
Isobutylene	-	-	-
Atmospheric pressure	VAISALA-PTU301	1010.3	1010
Borehole pressure	VAISALA-PTU301	1010.3	1010
Temperature	VAISALA-PTU301	20.6	22.3

Comments:

Prior to calibration the GasClam was allowed to stabilise in ambient air for 1 hour taking measurements at 3 minute intervals.

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

Pressure was calibrated using a known artificially generated higher pressure.

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

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	20.6
Atmospheric Pressure	1010.3
Relative Humidity	62.8

CGDT Technology Ltd, Pythia House (unit 10)
Bamford Business Park, Hibbert street
Stockport, SK4 1PL

CALIBRATION CERTIFICATE:



Certificate ref.	CGDTCAL_
Issued By:	CGD Technology Limited
Date:	14/09/2023
Staff:	Varghese Abraham
Instrument:	GasClam
Serial Number:	50-06-18

✓ ✓
0

Calibration Results			
Sensor	Lot No.	Reference Value	Indicated Value
Hydrogen sulphide	C24438	124	127.1
Carbon monoxide	C22238	42	41.5
Methane	C322626	58.82	58.5
Carbon dioxide	C322626	41.18	38.3
Oxygen	C322626	0	0
Isobutylene	-	-	-
Atmospheric pressure	VAISALA-PTU301	1010.3	1011
Borehole pressure	VAISALA-PTU301	1010.3	1010
Temperature	VAISALA-PTU301	20	19.4

Comments:

Prior to calibration the GasClam was allowed to stabilise in ambient air for 1 hour taking measurements at 3 minute intervals.
 The Instrument was calibrated by exposing the sensors to known values of gas concentrations.
 Pressure was calibrated using a known artificially generated higher pressure.
 The reference values are those generated by the certified source and indicated values are those measured by the GasClam.
 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	20
Atmospheric Pressure	1010.3
Relative Humidity	62.8

CGDT Technology Ltd, Pythia House (unit 10)
 Bamford Business Park, Hibbert street
 Stockport, SK4 1PL

CALIBRATION CERTIFICATE:



Certificate ref.	CGDTCAL_
Issued By:	CGD Technology Limited
Date:	14/09/2023
Staff:	Varghese Abraham
Instrument:	GasClam
Serial Number:	339-06-12

✓ ✓
0

Calibration Results			
Sensor	Lot No.	Reference Value	Indicated Value
Hydrogen sulphide	C24438	124	117.6
Carbon monoxide	C22238	42	44.8
Methane	C322626	58.82	60.7
Carbon dioxide	C322626	41.18	40.3
Oxygen	C322626	0	0.2
Isobutylene	-	-	-
Atmospheric pressure	VAISALA-PTU301	1010.3	1009
Borehole pressure	VAISALA-PTU301	1010.3	1009
Temperature	VAISALA-PTU301	20.3	20.9

Comments:

Prior to calibration the GasClam was allowed to stabilise in ambient air for 1 hour taking measurements at 3 minute intervals.

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

Pressure was calibrated using a known artificially generated higher pressure.

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

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	20.3
Atmospheric Pressure	1010.3
Relative Humidity	62.8

CGDT Technology Ltd, Pythia House (unit 10)
Bamford Business Park, Hibbert street
Stockport, SK4 1PL

CALIBRATION CERTIFICATE



Certificate ref. GFCAL00005
Issued By: VA
Date: 09/03/2023 Retest: 12 months from issue
Instrument: GasFlow Mk2
Instrument Serial Number: 03020005

Applied Flow Rate ± Ltr/hr (air)	Instrument Reading		Meet Specification
	+ Ltr/hr	- Ltr/hr	
0	0.0	0.0	PASS
1.2	1.2	-1.2	PASS
6	6.4	-6.5	PASS
18	17.3	-17.4	PASS
36	34.2	-33.8	PASS
60	60.9	-60.0	PASS

Ambient Conditions	
Temperature (°C)	19.6 ± 2 °C
Relative Humidity (%RH)	36.2 ± 10%
Barrometric Pressure (mB)	989 ± 10%

Notes:

Prior to calibration the instrument was inspected and fully charged.

The Instrument was calibrated using pumped air at ambient room conditions and measured using a rotometer at the outlet.

GasFlow Mk2 Instrument specification error is ±10% of reading or ±1Ltr/hr, whichever is the greater

CALIBRATION CERTIFICATE



Certificate ref. GFCAL00018
Issued By: VA
Date: 21/04/2023 Retest: 12 months from issue
Instrument: GasFlow Mk2
Instrument Serial Number: 03020018

Applied Flow Rate ± Ltr/hr (air)	Instrument Reading		Meet Specification
	+ Ltr/hr	- Ltr/hr	
0	0.0	0.0	PASS
1.2	1.1	-1.0	PASS
6	5.6	-5.6	PASS
18	19.4	-19.2	PASS
36	34.5	-35.0	PASS
60	60.2	-59.3	PASS

Ambient Conditions	
Temperature (°C)	20.6 ± 2 °C
Relative Humidity (%RH)	43.0 ± 10%
Barrometric Pressure (mB)	1004 ± 10%

Notes:

Prior to calibration the instrument was inspected and fully charged.

The Instrument was calibrated using pumped air at ambient room conditions and measured using a rotometer at the outlet.

GasFlow Mk2 Instrument specification error is ±10% of reading or ±1Ltr/hr, whichever is the greater

CALIBRATION CERTIFICATE



Certificate ref. GFCAL00019
Issued By: VA
Date: 22/03/2023 Retest: 12 months from issue
Instrument: GasFlow Mk2
Instrument Serial Number: 03020019

Applied Flow Rate ± Ltr/hr (air)	Instrument Reading		Meet Specification
	+ Ltr/hr	- Ltr/hr	
0	0.0	0.0	PASS
1.2	1.0	-1.0	PASS
6	5.7	-6.0	PASS
18	16.5	-17.1	PASS
36	35.9	-36.3	PASS
60	61.4	-62.8	PASS

Ambient Conditions	
Temperature (°C)	23.5 ± 2 °C
Relative Humidity (%RH)	44.8 ± 10%
Barrometric Pressure (mB)	970 ± 10%

Notes:

Prior to calibration the instrument was inspected and fully charged.

The Instrument was calibrated using pumped air at ambient room conditions and measured using a rotometer at the outlet.

GasFlow Mk2 Instrument specification error is ±10% of reading or ±1Ltr/hr, whichever is the greater

CERTIFICATION OF CALIBRATION



Date Of Calibration: 31-Jul-2023

4533

Certificate Number: G503519_2/33287

Issued by: QED Environmental Systems Ltd.

Customer: Ground Gas Solutions
Pythia House (Unit 10) Bamford Business Park Hibbert Street
Stockport Greater Manchester SK4 1PL UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G503519

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.072
15.0	14.9	0.13
60.0	59.8	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.0	14.7	0.13
40.0	40.1	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.2	20.3	0.25

The inwards assessment was carried out 22-Jul-2023.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 33.1 °C ± 2.5 °C

O₂ readings recorded at : 22.4 °C ± 2.5 °C

Barometric Pressure : 0994 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:117 IGC Instance:117

Page 1 of 2 | LP015GIUKAS-2.5

www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 31-Jul-2023

Certificate Number: G503519_2/33287

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
994	993

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
H ₂	1017	1,019
CO	500	502
H ₂ S	258.8	259

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5	5
10	

Date of Issue : 01-Aug-2023

Approved by Signatory



...i Zolota

...laboratory inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:117 IGC Instance:117


Page 2 of 2 | LP015GIUKAS-2.5

www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd, Cyan Park- Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

TEST DATE AND CONDITIONS	
Date	15/02/23
Atmospheric pressure	1007 mb
Ambient Temp	22.6 °C
Enviroics Serial No.	N/A

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

GFM22x OUTWARD INSPECTION & QUALITY CHECK

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number	Job Number(s)
333678	GFM 226	13793	24914 — —

Calibration Technician ... [REDACTED] **DATE** 13-2-23
Inspection Technician ... [REDACTED] **DATE** 16/02/23

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)	INSTRUMENT PACKING LIST	Tick if included
Function Tests	Keyboard Test	P	Instrument	✓
	Backlight Test	P	Leather Case	✓
	Clock Set / Running	P	AC Battery Charger (UK)	✓
	Pump Flow Test	P	AC Battery Charger (EURO)	X
	Pump Fail Test	P	AC Battery Charger (US)	X
	Battery Charge Test	P	Gas Sample Pipe	✓
	Service Date	18/08/23	Operation Manual (hardcopy)	X
Channel Tests	Verify CO2/ AMB (see stability test)	P	Carry Case	X
	Verify optional gases. (see cal cert)	P	Spares Pot	✓
DataBase Checks	Jobcard(s) completed and signed	P	Allen Key	✓
	Jobcard(s) booked off database	P	Extra Items:	
	Calibration certificate completed	P		
	Complete & print QI record	N/A		
Label Checks	Warranty / cal /label fitted	12237		

Comments:

Stability Test for GFM22x serial number: 13793 has passed

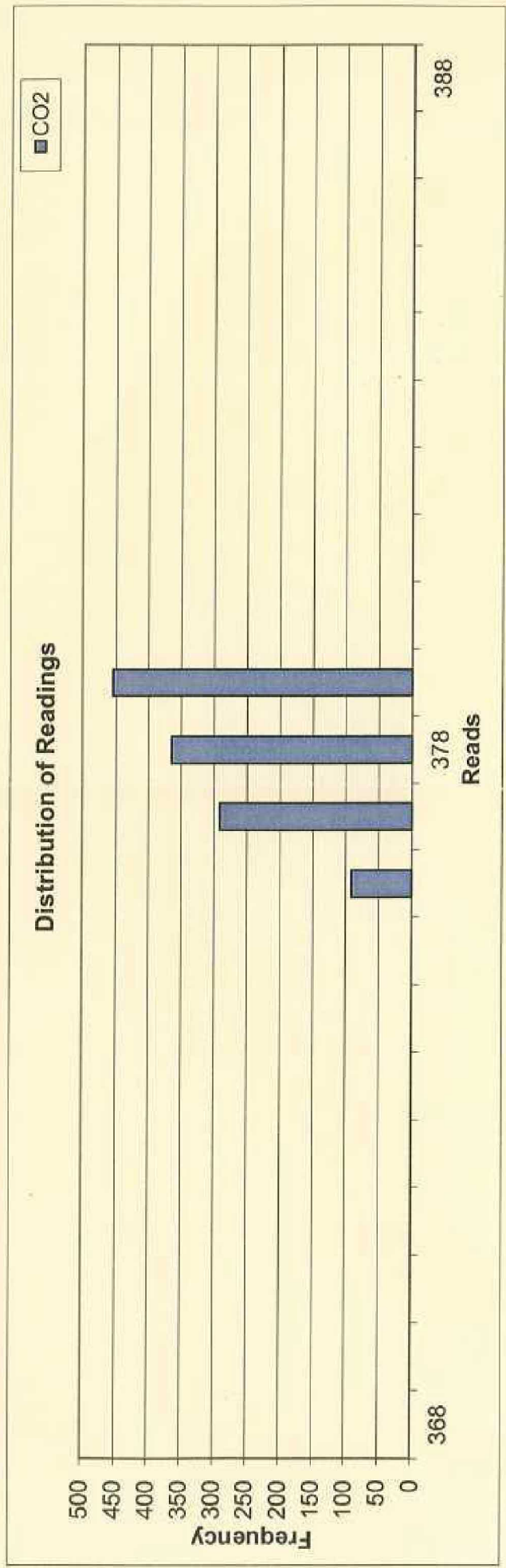
Import

Save

Print

Stability Test:	10 minutes (1200 tabs) of 400ppm CO2 flowing through the instrument.	
Date:	February 13, 2023	
Instrument:	13793	CO2 Reads
	Max Reads:	379
	Average Reads:	378
	Min Reads:	376

Frequency Distribution Results		
Within 1ppm	Within 5ppm	Within 10ppm
92.4%	100.0%	100.0%



TEST DATE AND CONDITIONS			
Date	04/11/2022		
Atmospheric Pressure	993	mB	
Ambient Temperature	21.9	°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	Ground Gas Solutions Ltd
Certificate Number	123633
Order Number	33.273

Serial Number	10356
Software Version	G430-00.0024/0013

Recalibration DUE Date
04/11/23

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	500	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 %	
		60.2	60	40.4	40	20.9
	Accept ±3.0	Accept ±3.0		Accept ±0.5		
	5.1	5	5.0	5	6.0	6
	Accept ±0.3		Accept ±0.3		Accept ±0.3	
Zero Reading 100% N ₂	0.0	0	0.0	0	0.0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Toxic Gas	Range (ppm)		Zero Reading		Instrument Gas Reading	
H ₂ S	5000	1500	0	Accept ±0.0	1502	Accept ±5.0
CO	2000	1000	0	Accept ±0.0	1000	Accept ±5.0

Cross Gas Effects								
Applied Gas (ppm)		Instrument Readings (ppm)						
Toxic Gas	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:		
H2S	1500	1502		0				
CO	1000	117		1000				

Pressure Checks						
Atmospheric Pressure [AP] (mB)				Static Pressure [SP] (mB)		
Current Atmospheric Pressure (mB)	Instrument Atmospheric Pressure Reading (mB)			Applied Pressure (mB)	Instrument Pressure (mB)	
All Ports	Open Ports	993	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

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading (l/h)	Instrument Reading (l/h)		Applied Pressure (Pa)	Instrument Reading (Pa)	
-30	-29.7	Accept ±3.0	-232	-233	Accept ±50
-3	-3.0	Accept ±1.0	-13	-13	Accept ±6.0
0	0.0	Accept ±0.0	0	0	Accept ±0.5
3	2.9	Accept ±0.5	13	12	Accept ±3.0
30	29.3	Accept ±3.0	247	243	Accept ±50
60	58.5	Accept ±6.0	706	696	Accept ±130
90	88.2	Accept ±9.0	1346	1341	Accept ±250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading °C	
Applied Temperature °C		
-10	-10.0	Accept ±2.0
0	0.0	Accept ±1.0
30	30.0	Accept ±1.0
60	60.0	Accept ±1.0
100	100.0	Accept ±1.0

Technician:
Jack Rutland

Date Tested:
04/11/2022

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 ISO14001:2015, BS EN ISO45001:2018 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.

TEST DATE AND CONDITIONS			
Date	22.12.22		
Atmospheric Pressure	983	mB	
Ambient Temperature	19.9	°C	
EnviroNics Serial No.	5089		

GAS DATA LTD Unit 4 Fairfield Court Seven Stars Estate Coventry CV3 4LJ UK +44 (0)24 7630 3311	 GAS DATA <small>SYSTEMS · ANALYTICAL · INFORMATICS</small>
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GFM435-1 (MCERTS) OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number + SW Version	Job Number(s)
350272	GFM435	11028 G435-24/04	123784

Calibration Technician

Date 22.12.22

Inspection Technician

Date 31.23

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		✓
	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	Gas Sample Pipe - (new issue)		✓
	Service Date set to?	22.12.23	Flow Sample Pipe - (new issue)		✓
Channel Tests	Data Logging Enabled?	P	Hard Carry Case		✓
	Verify CH4/LEL/Hexane/PID	P	Spares Pot		✓
	Verify CO2	P	Allen Key		X
	Verify O2	P	Temperature Probe		X
	Verify H2S	P	Vane Anemometer		X
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory stick		X
	Verify 1st Option Gas	NA	SiteMan Software	Ver 4.15	X
	Verify Atmospheric pressure	P	Internal Filter Pack	Qty	X
	Verify differential pressure	P	External Filter Pack	Qty	X
	Verify flow	P	Field Guide		X
	Verify temperature probe input	P	Extra Items: Sample Tube		
	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	11694		
	MCERTS label displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from Sales Order	5000	ppm		
	H2S Range from Cal Cert	5000	ppm		
	Over-range value correct?	P			

TEST DATE AND CONDITIONS			
Date	22/12/2022		
Atmospheric Pressure	983	mB	
Ambient Temperature	19.9	°C	
Envionics Serial No.	5089		

**GFM436 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	Ground Gas Solutions Ltd
Certificate Number	123784
Order Number	330272

Serial Number	11028
Software Version	G436-00.0024/0004

Recalibration DUE Date
22/12/23

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	500	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 Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
	60.2	60	40.2	40	20.9	20.9
	Accept ±3.0		Accept ±3.0		Accept ±0.5	
	5.0	5	5.0	5	6.0	6
	Accept ±0.3		Accept ±0.3		Accept ±0.3	
Zero Reading 100% N ₂	0.0	0	0.0	0	0.0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H ₂ S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0
CO	2000	1000	0	Accept ±0.0	999	Accept ±5.0
Hexane	2.0%	2.0%	0	Accept ±0.0	1.99	Accept ±10.0

Cross Gas Effects									
Applied Gas (ppm)		Instrument Readings (ppm)							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:	HEX		
H2S	1500	1500		0		0			
CO	1000	100		999		0			
Hexane	2.0%	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] (mB)			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		983	Accept ± 2.0
AP Port (Internal)	+800 mB	799	Accept ± 5.0
	+1200 mB	1200	Accept ± 5.0

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading (l/h)	Instrument Reading (l/h)		Applied Pressure (Pa)	Instrument Reading (Pa)	
-30	-30.2	Accept ± 3.0	-264	-265	Accept ± 50
-3	-3.0	Accept ± 1.0	-12	-12	Accept ± 6.0
0	0.0	Accept ± 0.0	0	0	Accept ± 0.5
3	3.0	Accept ± 0.5	13	12	Accept ± 3.0
30	30.0	Accept ± 3.0	283	282	Accept ± 50
60	59.8	Accept ± 6.0	841	838	Accept ± 130
90	89.8	Accept ± 9.0	1651	1674	Accept ± 250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading $^{\circ}\text{C}$	
Applied Temperature $^{\circ}\text{C}$		
-10	-10.0	Accept ± 2.0
0	0.0	Accept ± 1.0
30	30.0	Accept ± 1.0
60	60.0	Accept ± 1.0
100	100.0	Accept ± 1.0

Technician:
Jack Rutland




Date Tested:
22/12/2022

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 ISO14001:2015, BS EN ISO45001:2018 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.




Calibration Certificate - IRwin® (used for Universal setting)

Model: S SX SXT SXG SXGT **Serial No.:** 92001503

Please observe the recommended calibration intervals stated in the manual.

Mode		Range:	Gases used*:	Applicable for:	Checked
Ex		1 % LEL – 100 % LEL	2.5 Vol%	SX, SXG SXT SXGT	<input checked="" type="checkbox"/>
ExTox		1 % LEL – 100 % LEL CO ₂ : 0.1 Vol% - 5 Vol% O ₂ : 0.1 Vol% - 25 Vol% CO: 1 ppm – 500 ppm H ₂ S: 1 ppm – 400 ppm	H ₂ S 40 ppm CO 40 ppm CO ₂ 2.0 Vol% CH ₄ 2.2 Vol% N ₂ balance	SXT SXGT	<input type="checkbox"/>
Universal		Low range 1 ppm – 2.2 Vol% CH ₄	<input type="checkbox"/> ppm	ALL	<input checked="" type="checkbox"/>
			<input type="checkbox"/> ppm		
		High range 2.2 - 100 Vol% CH ₄	<input checked="" type="checkbox"/> 2.5 Vol%	ALL	<input checked="" type="checkbox"/>
			2.5 Vol%		
		CO ₂	20 Vol%	ALL	<input checked="" type="checkbox"/>
GC Analysis		Capability test only	CH ₄ 1 Vol% C ₂ H ₆ 50 ppm C ₃ H ₈ 1000 ppm	SXG SXGT	<input checked="" type="checkbox"/>

* Balance is synthetic air if nothing else stated

This equipment complies with the following certificates:			Applicable for:	Complies
	TÜV Rheinland: 968/FSP 1342.00/16	SW integrity	SX / SXG SXT / SXGT	<input checked="" type="checkbox"/>
	TÜV Rheinland: S 498 2016 C2	Toxic gases, oxygen LEL	SXT / SXGT	<input type="checkbox"/>
		Flammable gases (%LEL)	SX / SXG	<input checked="" type="checkbox"/>
	TÜV Rheinland: TÜV 16 ATEX 7822 x	Additional ATEX requirements	SXT / SXGT	<input checked="" type="checkbox"/>

For explosion protection see separate certificate

The above equipment is hereby declared to be in compliance with the quoted certificates and all INFICON production procedures:

Date of Certification: 25.01.2023 **Calibration performed by:** Ali

Signature: [Redacted Signature]



an ecotec company

CERTIFICATE OF CALIBRATION

Issued By: Ecotec Solutions, Inc.

Calibration Date: December 05, 2022

Recommended Calibration: December 05, 2024

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

Certificate #: 202205123550717

www.ecotecco.com

Customer: Company Name ENVIRONMENTAL INSTRUMENTS LTD.

Description: Gas Analyzer
Serial Number: 3550717

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	N70086009803	0.3 PPM	± 2.5%
PPM	CH ₄	9.99 PPM	70086129308	10 PPM	± 2.5%
PPM	CH ₄	500 PPM	70086030712	492.5 PPM	± 2.5%
PPM	CH ₄	2499 PPM	70086811308	2512.5 PPM	± 10%
PPM	CH ₄	10000 PPM	109631206	9976 PPM	± 10%
PPM	CH ₄	20000 PPM	109631303	20093.8 PPM	± 10%
PPM	CH ₄	999700 PPM	MET-040918-UHP	1031230 PPM	± 10%

Calibration Technician: Ana Moreno

Signature: 

Date: December 05, 2022

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an ecotec company

CERTIFICATE OF CALIBRATION

Issued By: Ecotec Solutions, Inc.

Calibration Date: May 03, 2023

Recommended Calibration: May 03, 2025

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

Certificate #: 202303054520413

www.ecotecco.com

Customer: Company Name ENVIRONMENTAL INSTRUMENTS LTD.

Description: Gas Analyzer
Serial Number: 4520413

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	N70086009803	0.2 PPM	± 2.5%
PPM	CH ₄	9.99 PPM	70086129308	9.8 PPM	± 2.5%
PPM	CH ₄	500 PPM	70086030712	490.8 PPM	± 2.5%
PPM	CH ₄	2499 PPM	70086811308	2470.8PPM	± 10%
PPM	CH ₄	10000 PPM	109631206	9894.6PPM	± 10%
PPM	CH ₄	20000 PPM	109631303	19949 PPM	± 10%
PPM	CH ₄	999700 PPM	MET-040918-UHP	967673 PPM	± 10%

Calibration Technician: Ana Moreno

Signature: 

Date: May 03, 2023

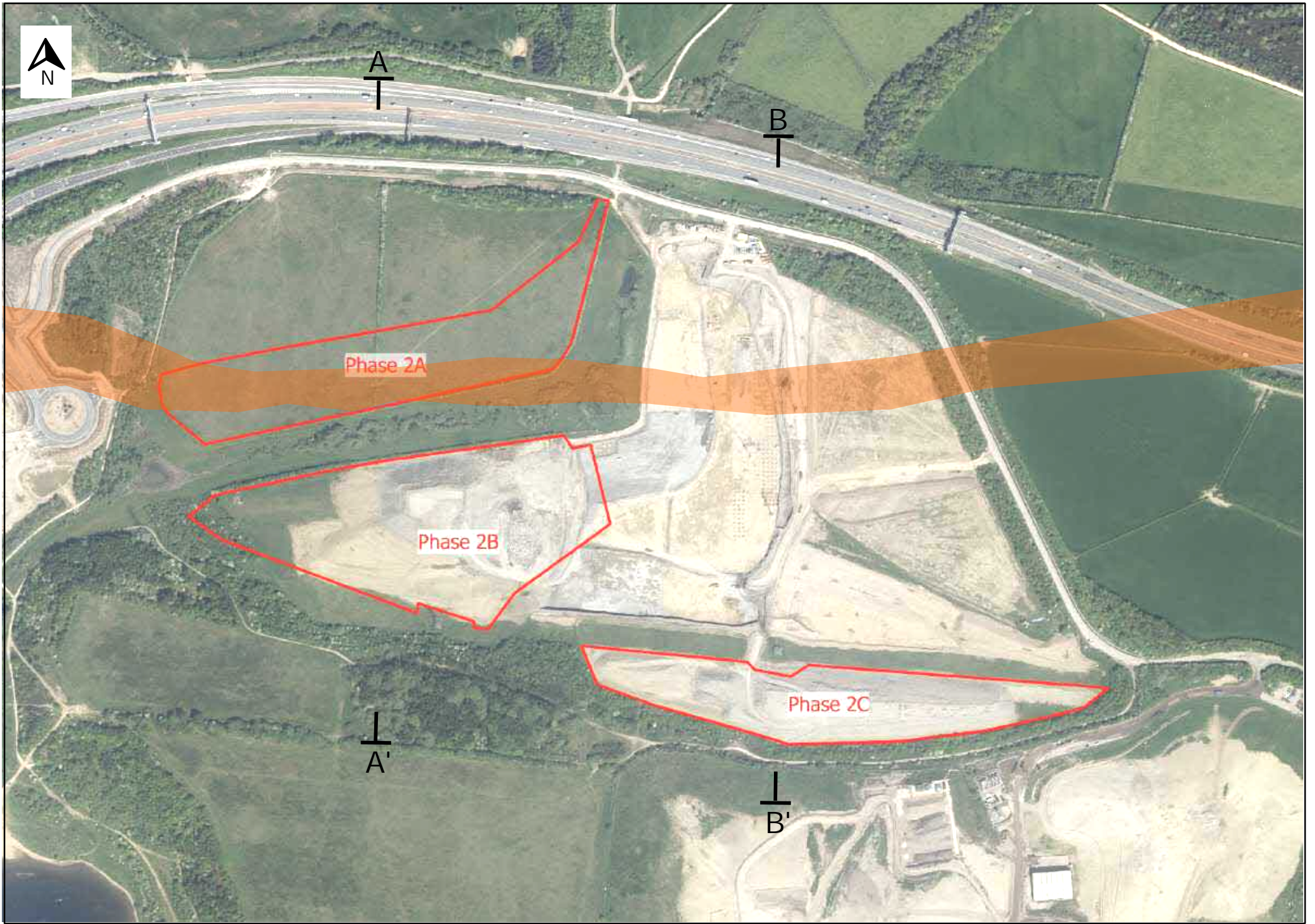
This certificate is issued in accordance with laboratory requirements of the National Institute of Standards and Technology. It provides traceability of measurement to recognized national standards, and to units of measurement realized at the National Institute of Standards and Technology or other recognized 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.

Page 1 of 1

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix I

Conceptual Site Model schematic



Key:	
	CSM Cross Section Line
	Approx. Fault Zone
	Phase Boundary Lines (Approx.)

Rev.	Date	Dwn.	Description	App'd
0	01/12/2020	SM		JD

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 © Copyright Bing Maps.

Title:
CSM Schematic Cross Section Plan

Project:
GGS2158 Skelton Grange, Phase 2

Drawing No.:
GGS2158_CSMCSP01



Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix J

Qualitative Risk Classification Matrix

Qualitative Risk Classification Matrix

Probability (likelihood)	Consequence			
	Minor	Mild	Medium	Severe
High likelihood	Low risk	Moderate risk	High risk	Very high risk
Likely	Low risk	Low to moderate risk	Moderate risk	High risk
Low likelihood	Very low risk	Low risk	Low to moderate risk	Moderate risk
Unlikely	Very low risk	Very low risk	Low risk	Low to moderate risk
No Pollutant Linkage	No potential risk			
Consequence Ratings	Minor	Mild	Medium	Severe
	<ul style="list-style-type: none"> -No measureable effect on humans -Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems -Repairable effects of damage to buildings, structures and services 	<ul style="list-style-type: none"> -Exposure to human healthy unlikely to lead to "significant harm" -Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce -Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long term maintenance of the population -Minor damage to crops, buildings or property 	<ul style="list-style-type: none"> -Elevated concentrations which could result in "significant harm" to humans health as defined by EPA 1990, Part 2A if exposure occurs -Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce -Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long term maintenance of the population -Significant damage to crops, buildings or property 	<ul style="list-style-type: none"> -Highly elevated concentrations likely to result in "significant harm" to humans healthy as defined by EPA 1990, Part 2A if exposure occurs -Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce -Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long term maintenance of the population -Catastrophic damage to crops, buildings or property
Probability Classification	Unlikely	Low likelihood	Likely	High likelihood
	<p>Improbable that exposure/event would occur even in the long term</p>	<p>Possible that exposure/event could occur. However, not certain that even over a long period that exposure/event would occur and is less likely in the shorter term</p>	<p>Probable that exposure/event would occur. However, exposure/event is not inevitable, but is possible in the short term and likely over the long term</p>	<p>Exposure/event very likely in the short term and almost inevitable over the long term, or evidence at the receptor of harm or pollution</p>

Ground Gas Verification (Post-Earthworks)
Phase 2A Development at Skelton Grange, Leeds

Appendix K

Flux Box Test Records



Experts in Continuous Monitoring

PROJECT: GGS3070

SITE: Skelton Grange, Phase 2

DATE: 18/10/2023

SPECIALIST: MR

EQUIPMENT	
Model	Serial Number
TDL - 500	4520413
GFM 226	13793

WEATHER CONDITIONS						GROUND CONDITIONS / GENERAL COMMENTS Frost, Wet etc.?			
General Comments: Sunny with a gentle breeze.						Generally bare ground, little vegetation. Some cracks in ground.			
Ambient Air Temp	15	Wind Direction	E	Start Wind Speed (m/sec)	7				
Start Pressure (mb):	999	End Pressure (mb):	999	End Wind Speed (m/sec)	7	Gas Management System Operational? Y/N	N	Atmospheric Pressure Trend	Falling

What3words ref	///little.fool.faces		Start Time	13:20	End Time	13:35
			Flux box ID	FB01		

Flux box Volume (ltrs)	165	Ground Seal?	Sand and bentonite	Pressure equalised & valve closed? Y/N	Y
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	CH4 (ppmv)	CO2 (ppmv)	Maximum Sampling Period 30 Secs? Y/N	Comments?
Fresh Air	2.4	372	N/A	
30 Sec	2.2	482	Y	
1 Min	2.4	470	Y	
2 Min	2.2	470	Y	
3 Min	2.0	464	Y	
4 Min	2.1	418	Y	
5 Min	2.2	421	Y	
10 Min	2.4	434	Y	
15 Min	2.5	388	Y	
20 Min				
25 Min				
30 Min				
40 Min				
50 Min				
60 Min				
Fresh Air	2.0	362	N/A	

Flux box duration (mins)	15
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KEY: ND = No Detection, NM = Not Measured, NR = Not Recorded, N/A = Not Applicable, * = see comments, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, Ltr/hr = litres per hour, mbgl = metres below ground level, SWL = standing water level, m/sec = metres per second, Sec = Second. Mins = minutes, Pa = Pascals, Ltrs = Litres



PROJECT: GGS3070

SITE: Skelton Grange, Phase 2

DATE: 18/10/2023

SPECIALIST: MR

EQUIPMENT	
Model	Serial Number
TDL - 500	4520413
GFM 226	13793

WEATHER CONDITIONS						GROUND CONDITIONS / GENERAL COMMENTS Frost, Wet etc.?			
General Comments: Sunny with gusts of wind.						Dry ground with no vegetation. Cracks in ground.			
Ambient Air Temp	15	Wind Direction	E	Start Wind Speed (m/sec)	7				
Start Pressure (mb):	998	End Pressure (mb):	997	End Wind Speed (m/sec)	7	Gas Management System Operational? Y/N	N	Atmospheric Pressure Trend	Falling

What3words ref	///buns.cube.claps	Start Time	14:03	End Time	14:19
		Flux box ID	FB02		

Flux box Volume (ltrs)	165	Ground Seal?	Sand and bentonite	Pressure equalised & valve closed? Y/N	Y
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	Hydrogen	Spare	Maximum Sampling Period 30 Secs? Y/N	Comments?
Fresh Air	2.0	362	N/A	
30 Sec	2.0	365	Y	
1 Min	2.1	364	Y	
2 Min	2.1	358	Y	
3 Min	2.2	367	Y	
4 Min	2.2	367	Y	
5 Min	2.4	391	Y	
10 Min	2.5	389	Y	
15 Min	2.6	394	Y	
20 Min				
25 Min				
30 Min				
40 Min				
50 Min				
60 Min				
Fresh Air	2.2	353	N/A	

Flux box duration (mins)	15
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KEY: ND = No Detection, NM = Not Measured, NR = Not Recorded, N/A = Not Applicable, * = see comments, %v/v = Percentage volume by volume, ppmv = parts per million by volume, mb = millibar, Ltr/hr = litres per hour, mbgl = metres below ground level, SWL = standing water level, m/sec = metres per second, Sec = Second. Mins = minutes, Pa = Pascals, Ltrs = Litres



PROJECT: GGS3070

SITE: Skelton Grange, Phase 2

DATE: 18/10/2023

SPECIALIST: MR

EQUIPMENT	
Model	Serial Number
TDL - 500	4520413
GFM 226	13793

WEATHER CONDITIONS					GROUND CONDITIONS / GENERAL COMMENTS Frost, Wet etc.?				
General Comments: Sunny with gusts of wind.					Dry ground with little vegetation. Cracks in ground.				
Ambient Air Temp	15	Wind Direction	E	Start Wind Speed (m/sec)					
Start Pressure (mb):	997	End Pressure (mb):	996	End Wind Speed (m/sec)	7	Gas Management System Operational? Y/N	N	Atmospheric Pressure Trend	Falling

What3words ref	///jelly.only.parks	Start Time	14:35	End Time	14:50
		Flux box ID	FB03		

Flux box Volume (ltrs)	165	Ground Seal?	Sand and bentonite	Pressure equalised & valve closed? Y/N	Y
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	Hydrogen	Spare	Maximum Sampling Period 30 Secs? Y/N	Comments?
Fresh Air	2.2	353	N/A	
30 Sec	2.1	357	Y	
1 Min	2.3	360	Y	
2 Min	2.2	360	Y	
3 Min	2.3	359	Y	
4 Min	2.3	358	Y	
5 Min	2.4	360	Y	
10 Min	2.3	379	Y	
15 Min	2.1	377	Y	
20 Min				
25 Min				
30 Min				
40 Min				
50 Min				
60 Min				
Fresh Air	2.1	348	N/A	

Flux box duration (mins)	15
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PROJECT: GGS3070

SITE: Skelton Grange, Phase 2

DATE: 18/10/2023

SPECIALIST: MR

EQUIPMENT	
Model	Serial Number
TDL - 500	4520413
GFM 226	13793

WEATHER CONDITIONS					GROUND CONDITIONS / GENERAL COMMENTS Frost, Wet etc.?				
General Comments: Sunny with a gentle breeze.					Flat ground with tufts of vegetation. Landfill odour present.				
Ambient Air Temp	15	Wind Direction	E	Start Wind Speed (m/sec)					
Start Pressure (mb):	996	End Pressure (mb):	996	End Wind Speed (m/sec)	7	Gas Management System Operational? Y/N	N	Atmospheric Pressure Trend	Falling

What3words ref	///they.lively.length	Start Time	15:08	End Time	15:23
		Flux box ID	FB04		

Flux box Volume (ltrs)	165	Ground Seal?	Sand and bentonite	Pressure equalised & valve closed? Y/N	Y
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	Hydrogen	Spare	Maximum Sampling Period 30 Secs? Y/N	Comments?
Fresh Air	2.1	348	N/A	
30 Sec	2.2	358	Y	
1 Min	2.4	358	Y	
2 Min	2.1	382	Y	
3 Min	2.3	411	Y	
4 Min	2.5	415	Y	
5 Min	2.3	409	Y	
10 Min	2.0	435	Y	
15 Min	2.0	478	Y	
20 Min				
25 Min				
30 Min				
40 Min				
50 Min				
60 Min				
Fresh Air	2.1	367	N/A	

Flux box duration (mins)	15
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