



CCG-C-25-15990

**GROUND INVESTIGATION REPORT
FOR SITE AT**

**AVONDALE NURSING HOME
SANDSTONE DRIVE
WHISTON
L35 7LS**

MARCH 2026



Prepared by:

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DOCUMENT CONTROL FORM	
Client:	DELPHSIDE LTD (Trading as Avondale Nursing Home)
Project Title:	GROUND INVESTIGATION REPORT FOR AVONDALE NURSING HOME, WHISTON
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FOR AND BEHALF OF CC GEOTECHNICAL LTD	
Date:	March 2026
Revision Number:	0
Comments:	
Status:	ISSUE
Distribution:	DELPHSIDE LTD (Trading as Avondale Nursing Home)
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1.0 INTRODUCTION

CC GEOTECHNICAL LTD (CCG) is providing ground investigation consultancy services to **DELPHSIDE LTD** (*Trading as Avondale Nursing Home*) – *The Client / property owner*, in connection with resolution of planning issues concerning the recently constructed single storey extension block at Avondale Nursing Home, Whiston, L35 7LS.

Following a review of the previously submitted Phase II Geoenvironmental Report (CCG-C-16-8877; March 2016) in connection with the discharge of relevant planning conditions (**KNOWSLEY COUNCIL** planning application number: 15/00296/FUL), the Council requested (Dec 2025) that a Ground Gas Risk Assessment be carried out to determine if a credible risk to human health is present, due to the presence of 2nr landfills in close proximity to the site.

The purpose of this report is to provide the findings of a ground gas monitoring programme and a resultant Ground Gas Risk Assessment

This report should be read in conjunction with the following documentation:

- Phase I Desk Study Report, prepared by **CCG** under report reference CCG-C-15-8578, September 2015
- Phase II Geoenvironmental Report, prepared by **CCG** under report reference CCG-C-16-8877, March 2016
- **CCG** Notes on Limitations given in Appendix E

2.0 AIMS & OBJECTIVES OF THE INVESTIGATION

The aims & objectives of this Ground Investigation:

- The provision of factual information and interpretative comment on ground conditions in relation to ground gas potential
- The assessment of the nature and extent of gas contamination in relation to potential risks to human health for end users and construction workers
- The assessment of the nature and extent of gas contamination in relation to potential risks to the fabric of buildings and services
- The identification of feasible remediation measures to remove or break any identified gas risk linkages

3.0 SITE DATA

3.1 Site Location and Description

The study site is situated within the curtilage of the Avondale Nursing Home, 11 Sandstone Drive, Prescott, Whiston, Merseyside, L35 7LS, as shown on Drawing No.25-15990-1, presented herein. The Ordnance Survey coordinates for the approximate site centre are 348071E 392251N, the area to be redeveloped stands at an approximate elevation of 80m Above Ordnance Datum.

The overall site is situated within a mixed residential – commercial context and comprises an irregular shaped parcel of land which extends to the approximate dimensions of 110m x 85m, its long axis being on an east-west alignment.

To the south and east it is bound by public pavements extending along Sandstone Drive, beyond which lies a development of residential dwellings and associated private gardens. It is bound to the west by the **DUDLEY WALLIS CENTRE** (NHS) and associated grounds. Its northern boundary adjoins a car parking facility and an extensive parcel of derelict land.

The parcel of land to be redeveloped is located within the south-eastern section of the site where the surface comprises mixed

maintained lawns with areas of ornamental planting, communal lawns and pockets of mixed scrub species.

Photographs of the site taken in January 2026 are presented within Appendix B.

3.2 Documented Geology

3.2.1 Solid & Drift Geology

The geology of the site was proven in Phase II Geoenvironmental Report, prepared by **CCG** under report reference CCG-C-16-8877, March 2016 which showed the site to be underlain by thin superficial deposits of topsoil resting directly on sandstone bedrock. These findings were consistent with the 1:50000 scale British Geological Survey (BGS) Sheet 097 Runcorn (Solid and Drift editions which show the site to be devoid of drift deposits. The solid geology is documented as the Chester Pebble Beds Formation (*formerly the Bunter Pebble Beds*) of moderate - high permeability comprising fine- to coarse-grained, commonly pebbly cross-stratified sandstones with conglomerates and sporadic siltstones horizons of the Early-Triassic Period.

There are no documented geological lines of weakness (faults/coal seams) within 100m of the study site, the nearest being c.128m west.

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level, and hence no radon protection measures are required.

Taking account of the proven geology, the study described herein was required to consider potential gas migration via fractures and fissures in the bedrock formation.

3.2.2 Nearby Landfills

It is recorded that 2nr historic landfills are located in close proximity to the site (c.20m northwest) – former Holt Lane Quarry. An extract of the map is presented in Fig 1 hereunder.

Fig 1. Recorded Landfill



4.0 SCOPE OF INTRUSIVE INVESTIGATION

An Intrusive Investigation was carried out and comprised the sinking of 3nr exploratory boreholes into the underlying natural bedrock, to facilitate the installation of monitoring wells in order to obtain sufficient ground gas data to reliably assess risks to residents and the built environment.

5.0 FIELDWORK

5.1 Introduction

A programme of fieldwork investigation was undertaken January 2026. The fieldwork was planned and carried out in accordance with BS10175:2017, BS5930:2020, and the sampling & monitoring methodologies employed by **CCG**.

The layout of the investigation is illustrated on **CCG** Drawing 25-15990-2 presented in Appendix A.

5.2 Boreholes (BH1 to BH3)

In accordance with the ground investigation plan, 3nr boreholes (BH1 to BH3) were sunk into the bedrock using rotary coring methods using a Comacchio GEO 205 rig, each borehole extending to 5mbgl.

Logs of the boreholes, annotated with samples, rock parameters (BH3 only) of TRC, SCR and RQD values, rock core descriptions, and strength classifications are given in Appendix C.

Photographs of rock cores (BH3) are also presented in Appendix C.

5.3 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted tube set in bentonite and non-limestone pea gravel surrounds were installed in all 3nr boreholes (BH1 to BH3). Each standpipe was fitted with a gas valve connector, and was protected by a flush, lockable cover set in concrete. Construction details are contained in the tabulation below:

Table 1: Standpipe Construction

BOREHOLE	DEPTH OF BOREHOLE [mbgl]	DEPTH OF STANDPIPE [mbgl]	RESPONSE ZONE	
			FROM [mbgl]	TO [mbgl]
BH1	5.0	5.0	1.0	5.0
BH2	5.0	5.0	1.0	5.0
BH3	5.0	5.0	1.0	5.0

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GA infra-red analyser. The installations were also monitored for standing water levels with an electronic dip meter. The results of the gas and groundwater monitoring data are given in Appendix D.

6.0 OBSERVED GROUND CONDITIONS

6.1 Stratigraphy

The stratigraphy of the boreholes was generally consistent with the predicted geology.

As anticipated, the site was observed to be underlain by a thin veneer of grassed topsoil extending to around 0.6mbgl, underlain by reddish brown weathered SANDSTONE, proven to 5.0mbgl.

6.2 Groundwater Regime

Groundwater was not encountered during the borehole sinking nor in subsequent standpipe monitoring.

7.0 GROUND GAS RISK ASSESSMENT

The potential sources of gas identified in the Tier 1 Risk Assessment were generally considered as sources of “Low” generation potential, and, given the “High” sensitivity commercial end use, a programme of standpipe monitoring comprising 6 rounds

distributed over a period of a 3 month period, in accordance with the guidance of CIRIA C665.

From the data obtained in the programme, a ground gas risk assessment may be carried out by the CIRIA C665 method which uses typical maximum soil gas concentrations and worse case borehole flow rates to define a “Characteristic Situation” for the shallow gas regime. The volumetric gas flow rate used by the risk assessment is termed a ‘Gas Screening Value’ (GSV) and is defined as follows:

$$GSV \text{ (litres/hr)} = \text{borehole flow rate (litres/hr)} \times \text{gas concentration}$$

The results are contained in Appendix D and tabulated hereunder.

Table 2: Gas Monitoring Data

Position	BH1	BH2	BH3
No Monitoring Visits	6	6	6
Highest CH ₄ (%)	Nil	Nil	Nil
Highest CO ₂ (%)	2.4	2.6	0.7
Lowest O ₂ (%)	18.0	16.8	19.1
Highest H ₂ S (ppm)	Nil	Nil	Nil
Highest CO (ppm)	Nil	Nil	Nil
Highest Flow (l/hr)	<0.1	<0.1	<0.1
Water Levels (m)	Dry	Dry	Dry
PID response	0	0	0
Pressure Range (mb)	973 to 1002		

These above results give a Gas Screening Value (GSV) of 0.0024 l/hr for CO₂. Using the GSV value, the risk to the proposed development was assessed in line with building Situation A as defined in CIRIA C665. On the basis of this building classification, the results conform to Characteristic Situation 1, under which gas protection measures are not required.

8.0 CONCLUSIONS & RECOMMENDATIONS

Based on the gas monitoring data obtained within this investigation, the original conclusions remain valid and gas protection measures are not required.



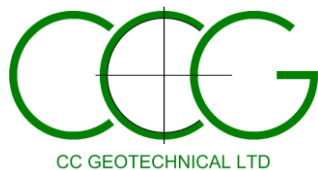
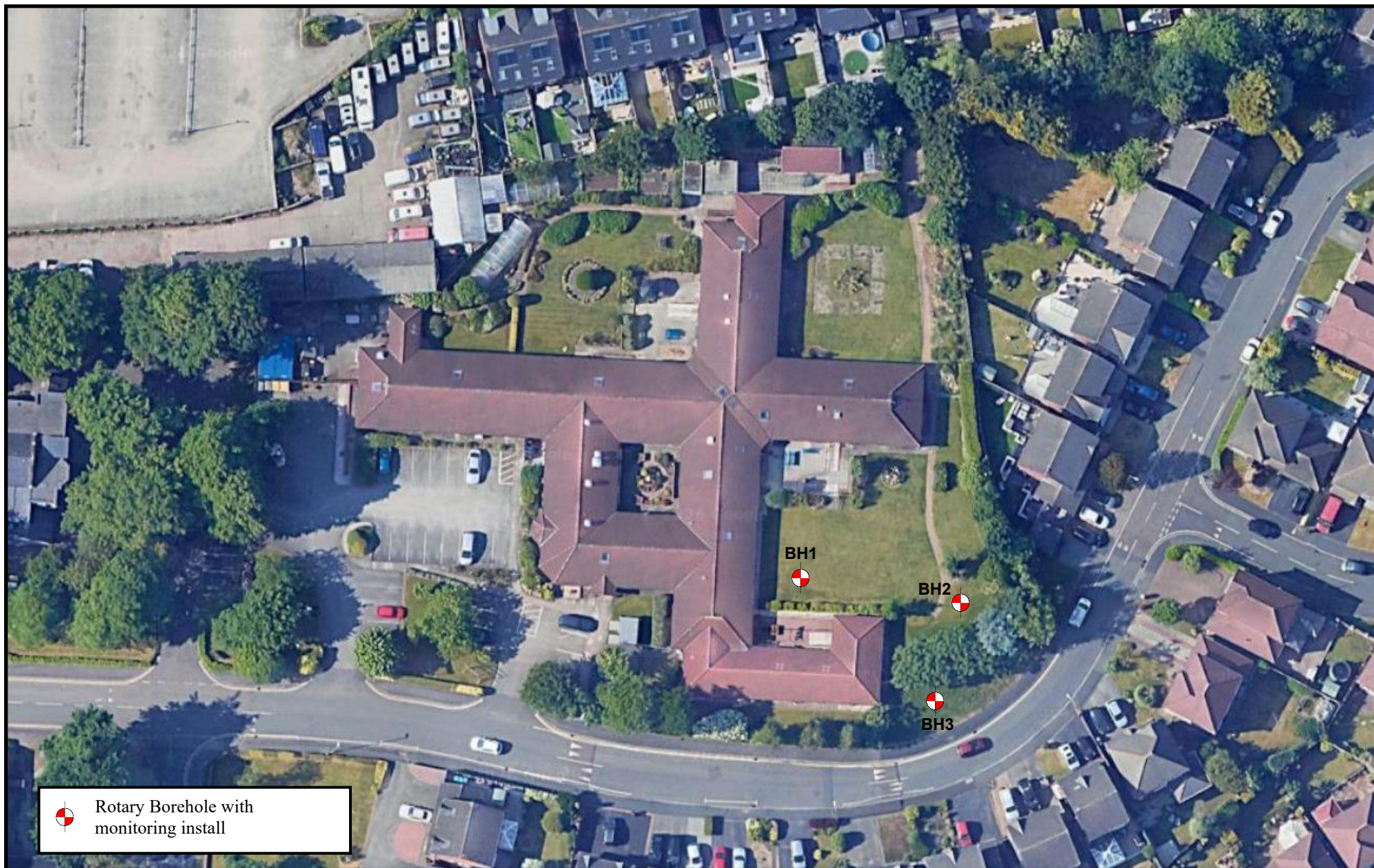
APPENDIX A

DRAWINGS



Unit 1
 Deltic Way
 Knowsley Industrial Estate
 Merseyside
 L33 7BA
 e: enquiries@ccgeotechnical.com
 w: www.ccgeotechnical.com

Site	Avondale Nursing Home, Whiston
Job Number:	25-15990
Drawing:	Site Location Plan
Drawing Number:	25-15990-1



Unit 1
Deltic Way
Knowsley Industrial Estate
Merseyside
L33 7BA
e: enquiries@ccgeotechnical.com
w: www.ccgeotechnical.com

Site	Avondale Nursing Home, Whiston
Job Number:	25-15990
Drawing:	Site Investigation Plan
Drawing Number:	25-15990-2



APPENDIX B

SITE PHOTOGRAPHS

Plate 1:
South eastern corner
looking south



Plate 2:
South eastern corner
looking north west



Plate 3:
South eastern corner
looking north



Plate 4:
South eastern corner
looking west



Plate 5:
South eastern corner
looking east



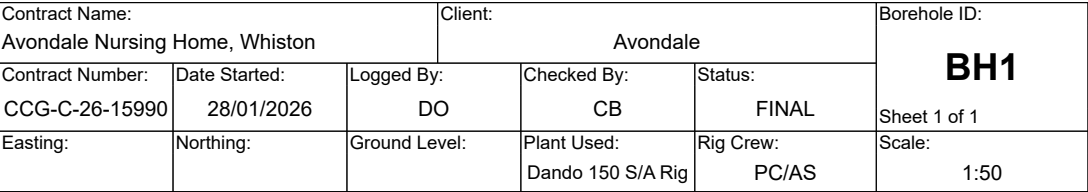
Plate 6:
South eastern corner
outside of site looking
north





APPENDIX C

BOREHOLE LOGS

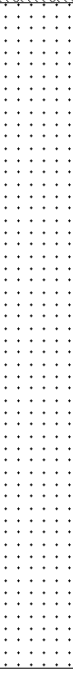


Weather: Dry

Termination: Scheduled depth

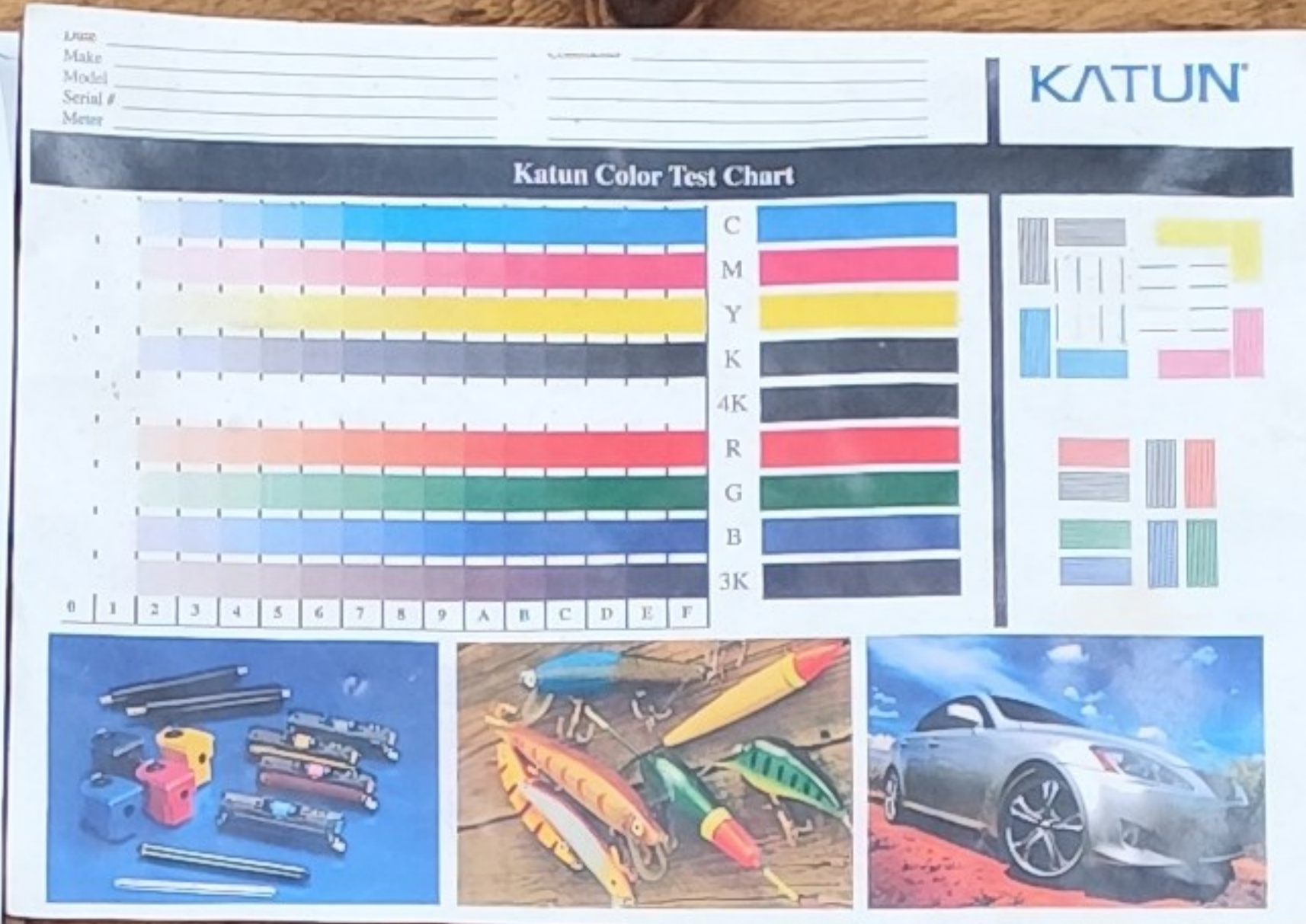
Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.50	B			(0.60)		Grassed TOPSOIL		
0.65	B			0.60		Reddish brown weathered SANDSTONE		
1.00	B						1	
							2	
				(4.40)			3	
							4	
				5.00		End of Borehole at 5.00m	5	
							6	
							7	
							8	
							9	
							10	

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit. Borehole sunk to 5.0mbgl by rotary open hole methods.					
									Water Strikes					
Chiselling					Installation				Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)				0		Dry
					0.00 1.00	1.00 5.00	PLAIN SLOTTED							
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.co.uk														

	Contract Name: Avondale Nursing Home, Whiston				Client: Avondale			Borehole ID: BH2						
	Contract Number: CCG-C-26-15990		Date Started: 28/01/2026		Logged By: DO	Checked By: CB	Status: FINAL	Sheet 1 of 1						
	Easting:		Northing:		Ground Level:	Plant Used: Dando 150 S/A Rig	Rig Crew: PC/AS	Scale: 1:50						
Cable Percussion Borehole Log					Weather: Dry					Termination: Scheduled depth				
Samples & In Situ Testing					Strata Details					Groundwater				
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation			
0.50	B			(0.60)		Grassed TOPSOIL								
0.70	B			0.60		Reddish brown weathered SANDSTONE								
1.00	B									1				
										2				
										3				
				(4.40)						4				
										5				
				5.00		End of Borehole at 5.00m				6				
										7				
										8				
										9				
										10				
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit. Borehole sunk to 5.0mbgl by rotary open hole methods.					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	
				0.00	1.00	PLAIN					0		Dry	
				1.00	5.00	SLOTTED								
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.co.uk														

	Contract Name: Avondale Nursing Home, Whiston				Client: Avondale				Borehole ID: BH3						
	Contract Number: CCG-C-26-15990		Date Started: 28/01/2026		Logged By: DO		Checked By: CB		Status: FINAL		Sheet 1 of 1				
	Easting:		Northing:		Ground Level:		Plant Used: Rotary Rig		Rig Crew: PC/AS		Scale: 1:50				
Rotary Core Drilling Log				Weather: Dry				Termination: Scheduled depth							
Samples & In Situ Testing						Strata Details						Groundwater			
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/Installation		
							(0.50)		Grassed TOPSOIL						
0.50 - 2.00	97	47	8	NR			0.50		Reddish brown occasionally grey fine to medium grained SANDSTONE. Moderately weathered. Recovered locally as sandy gravel and gravel. Discontinuities are extremely close to medium spaced, horizontal, clean and rough			1			
				NO RECOVERY - 0.50-0.55mbgl											
				NON-INTACT, RECOVERED AS CLAYEY SAND - 0.55-0.62mbgl											
				NON-INTACT, RECOVERED AS SANDY GRAVEL - 0.95-1.25mbgl											
				NON-INTACT, RECOVERED AS GRAVEL - 1.34-1.71mbgl											
2.00 - 3.50	100	55	31	NI			(4.50)		NON-INTACT, RECOVERED AS VERY GRAVELLY SAND - 2.00-2.51mbgl			2			
				NON-INTACT, RECOVERED AS GRAVEL - 2.60-2.65mbgl											
				NON-INTACT, RECOVERED AS GRAVEL - 2.82-3.00mbgl											
3.50 - 5.00	93	91	83	NR			5.00		NO RECOVERY - 3.50-3.60mbgl			3			
												4			
												5			
												6			
												7			
												8			
												9			
												10			
Start & End of Shift Observations						Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit. Borehole sunk to 5.0mbgl by rotary coring methods.						
Flush Information						Top (m)		Base (m)		Water Strikes					
						0.00		1.00		Strike (m) Casing (m) Sealed (m) Time (mins) Rose to (m) Remarks					
Top (m)	Base (m)	Flush Type	Return	Flush Colour	0.00	1.00	PLAIN SLOTTED		0 Dry						
									Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %						
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REF: CCG-C-25-15990
SITE: AVONDALE NURSING
HOME, LIVERPOOL
CLIENT: AVONDALE NURSING
HOME
BH3 0.5-3.5mbgl



0.5

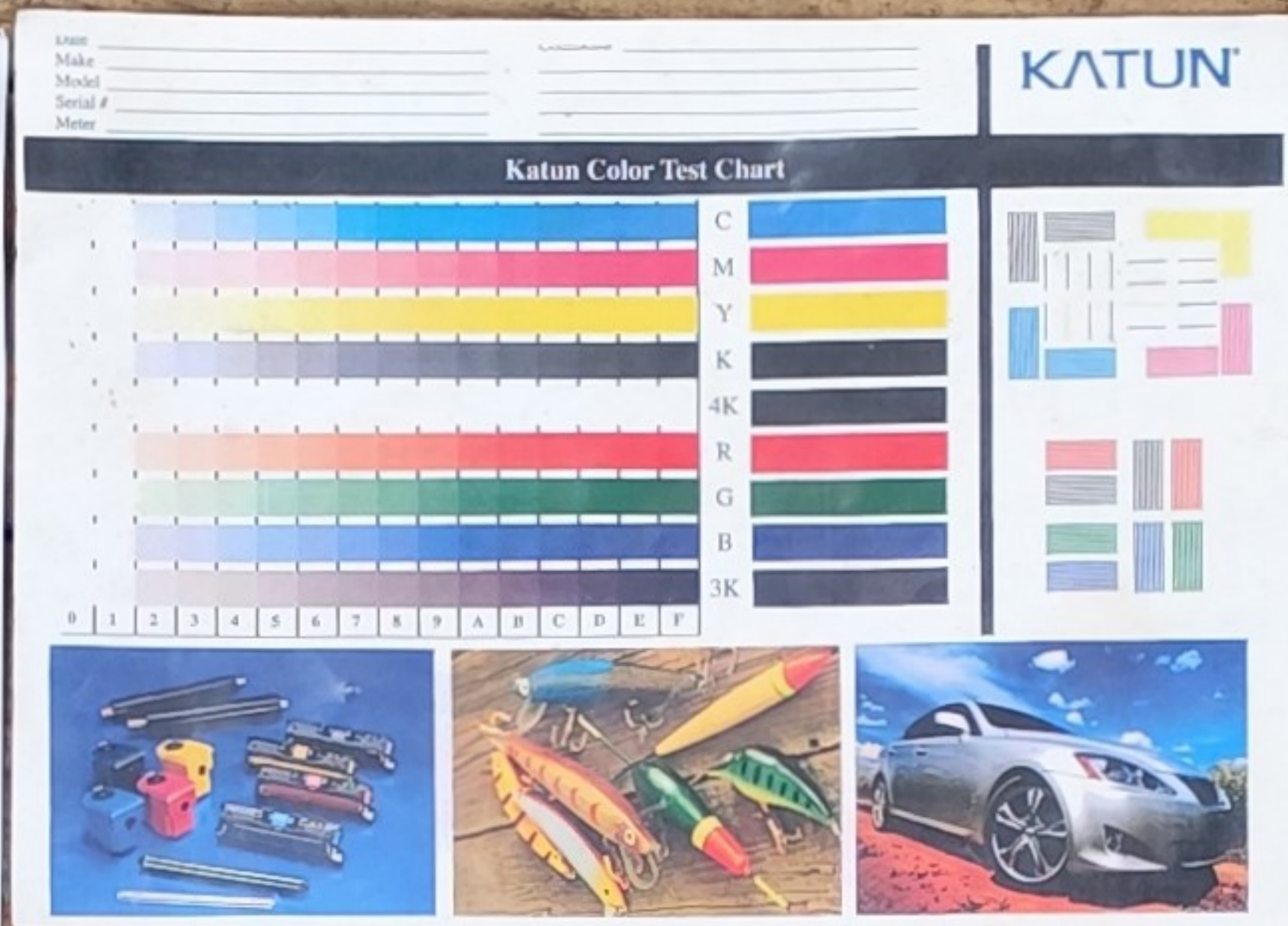
2.0

2.0

3.5



REF: CCG-C-25-15990
SITE: AVONDALE NURSING
HOME, LIVERPOOL
CLIENT: AVONDALE NURSING
HOME
BH3 3.5-5.0mbgl



3.5

5.0





APPENDIX D

GAS MONITROING DATA

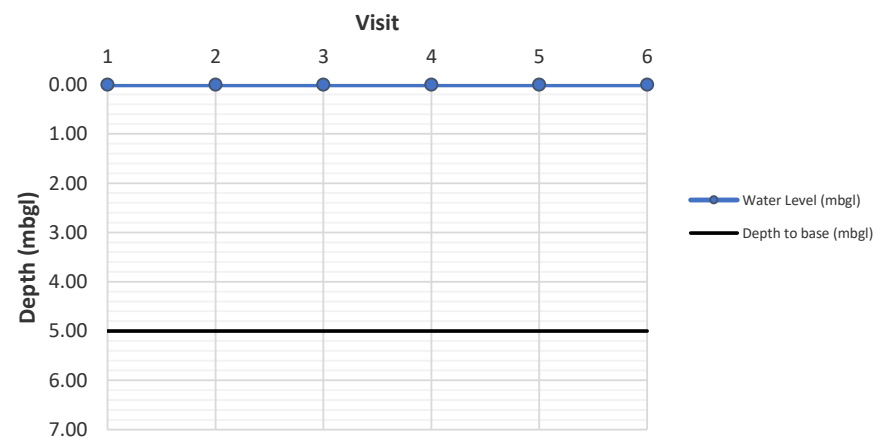
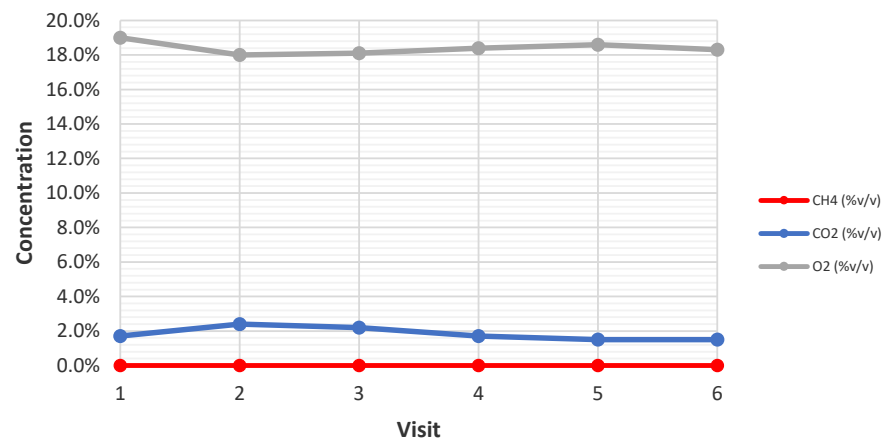
GROUND GAS AND GROUNDWATER MONITORING DATA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers



Job Number:	CCG-C-26-15990	Date of Installation:	28/01/2026
Site:	Avondale Care Home, Whiston	Monitoring programme:	6 visits / 3 Months
Client:	Avondale Care Home, Whiston	Instrument used:	GFM
Location Reference:	BH1	Logged by:	LT
Installation Depth (mbgl):	5.00	Approved by:	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH ₄ (%v/v)	CO ₂ (%v/v)	O ₂ (%v/v)	Flow Rate (l/hr)	H ₂ S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	29/01/2026	Overcast	Moderate	Dry	Damp	990	0.0%	1.7%	19.0%	<0.01	0.0	0.0	DRY	5.00
2	05/02/2026	Overcast	Strong	Rain	Wet	973	0.0%	2.4%	18.0%	<0.01	0.0	0.0	DRY	5.00
3	12/02/2026	Overcast	Light	Dry	Damp	983	0.0%	2.2%	18.1%	<0.01	0.0	0.0	DRY	5.00
4	19/02/2026	Overcast	Moderate	Dry	Damp	997	0.0%	1.7%	18.4%	<0.01	0.0	0.0	DRY	5.00
5	26/02/2026	Overcast	Moderate	Dry	Damp	999	0.0%	1.5%	18.6%	<0.01	0.0	0.0	DRY	5.00
6	11/03/2026	High Cloud	Moderate	Dry	Dry	1002	0.0%	1.5%	18.3%	<0.01	0.0	0.0	DRY	5.00



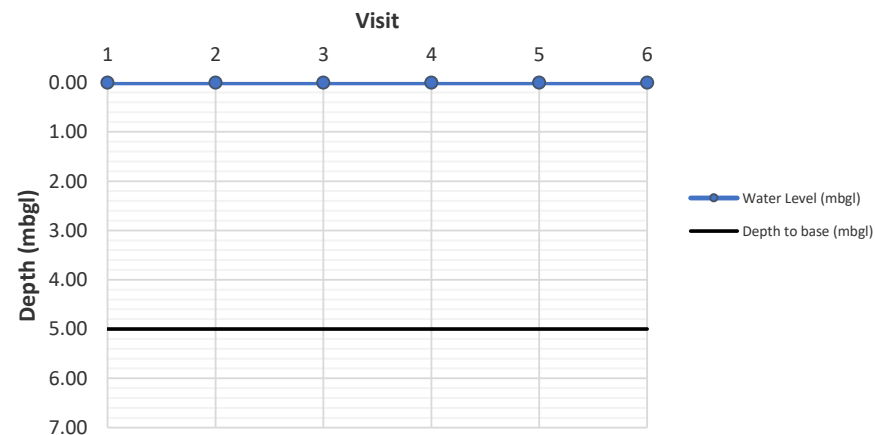
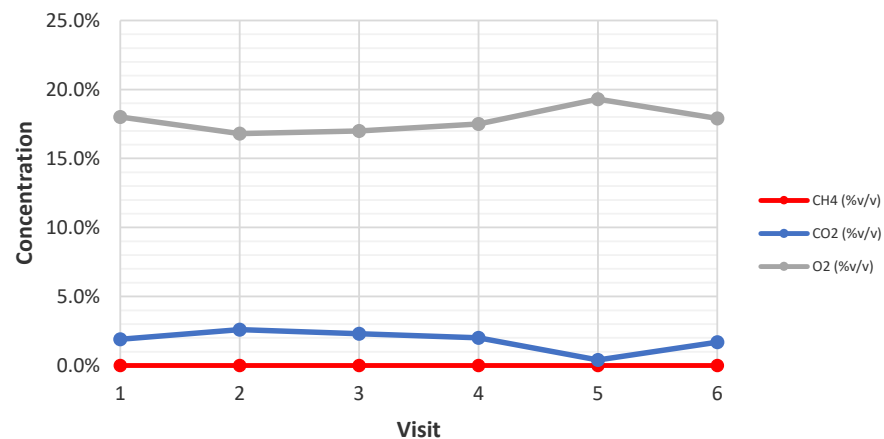
GROUND GAS AND GROUNDWATER MONITORING DATA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers



Job Number:	CCG-C-26-15990	Date of Installation:	28/01/2026
Site:	Avondale Care Home, Whiston	Monitoring programme:	6 visits / 3 Months
Client:	Avondale Care Home, Whiston	Instrument used:	GFM
Location Reference:	BH2	Logged by:	LT
Installation Depth (mbgl):	5.00	Approved by:	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH ₄ (%v/v)	CO ₂ (%v/v)	O ₂ (%v/v)	Flow Rate (l/hr)	H ₂ S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	29/01/2026	Overcast	Moderate	Dry	Damp	990	0.0%	1.9%	18.0%	<0.01	0.0	0.0	DRY	5.00
2	05/02/2026	Overcast	Strong	Rain	Wet	973	0.0%	2.6%	16.8%	<0.01	0.0	0.0	DRY	5.00
3	12/02/2026	Overcast	Light	Dry	Damp	983	0.0%	2.3%	17.0%	<0.01	0.0	0.0	DRY	5.00
4	19/02/2026	Overcast	Moderate	Dry	Damp	997	0.0%	2.0%	17.5%	<0.01	0.0	0.0	DRY	5.00
5	26/02/2026	Overcast	Moderate	Dry	Damp	999	0.0%	0.4%	19.3%	<0.01	0.0	0.0	DRY	5.00
6	11/03/2026	High Cloud	Moderate	Dry	Dry	1002	0.0%	1.7%	17.9%	<0.01	0.0	0.0	DRY	5.00



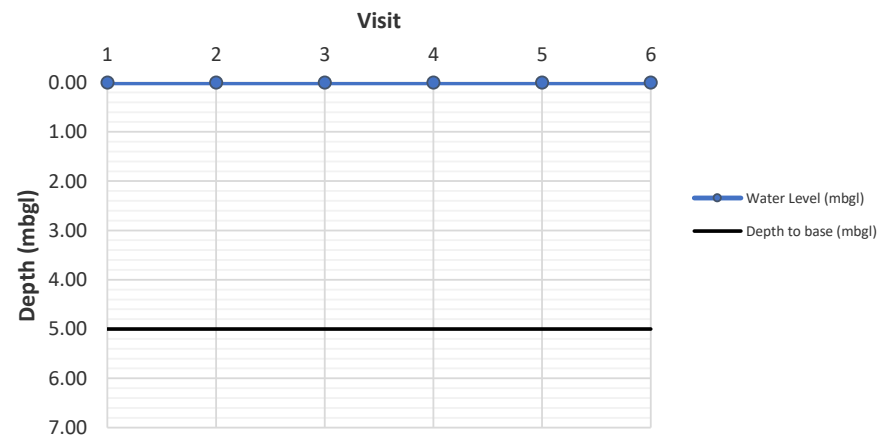
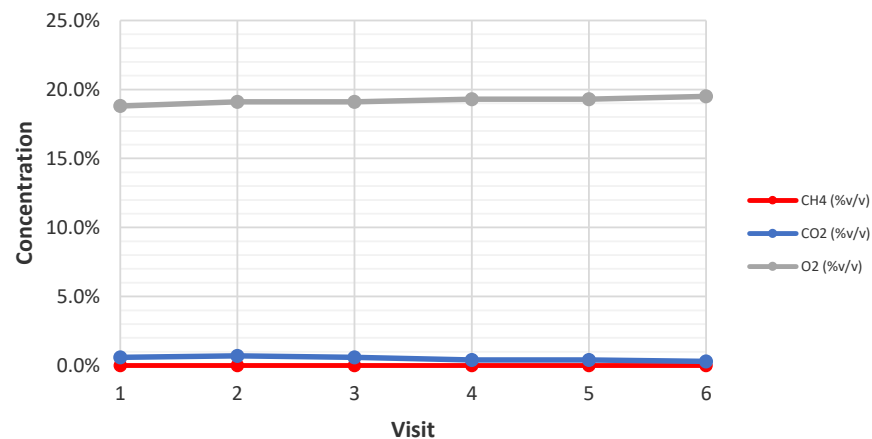
GROUND GAS AND GROUNDWATER MONITORING DATA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers



Job Number:	CCG-C-26-15990	Date of Installation:	28/01/2026
Site:	Avondale Care Home, Whiston	Monitoring programme:	6 visits / 3 Months
Client:	Avondale Care Home, Whiston	Instrument used:	GFM
Location Reference:	BH3	Logged by:	LT
Installation Depth (mbgl):	5.00	Approved by:	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH ₄ (%v/v)	CO ₂ (%v/v)	O ₂ (%v/v)	Flow Rate (l/hr)	H ₂ S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	29/01/2026	Overcast	Moderate	Dry	Damp	990	0.0%	0.6%	18.8%	<0.01	0.0	0.0	DRY	5.00
2	05/02/2026	Overcast	Strong	Rain	Wet	973	0.0%	0.7%	19.1%	<0.01	0.0	0.0	DRY	5.00
3	12/02/2026	Overcast	Light	Dry	Damp	983	0.0%	0.6%	19.1%	<0.01	0.0	0.0	DRY	5.00
4	19/02/2026	Overcast	Moderate	Dry	Damp	997	0.0%	0.4%	19.3%	<0.01	0.0	0.0	DRY	5.00
5	26/02/2026	Overcast	Moderate	Dry	Damp	999	0.0%	0.4%	19.3%	<0.01	0.0	0.0	DRY	5.00
6	11/03/2026	High Cloud	Moderate	Dry	Dry	1002	0.0%	0.3%	19.5%	<0.01	0.0	0.0	DRY	5.00



TEST DATE AND CONDITIONS			
Date		14/07/2025	
Atmospheric Pressure Ambient Temperature Envionics Serial No.		993	mB
		22.1	°C
		5089	

***GFM436 Final Inspection & Calibration
Check Certificate***

GAS DATA LTD

Unit D

Earlplace Business Park

Fletchamstead Highway

Coventry

CV4 9XL

Tel 02476303311

Fax 02476307711



GAS DATA
LISTEN • ANALYSE • INFORM

Customer	Gas Data
Certificate Number	126441
Order Number	344192

Serial Number	14102
Software Version	G436-00.0037/0010

Recalibration DUE Date
14/07/26

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	450	Accept > 200 cc/min	Pump Flow @ -200mB	300	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %
	Readings %		Readings %		Readings %	
	59.7	60	39.8	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% N2	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	
H2S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0%
CO	2000	1000	0	Accept ±0.0	1002	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	80		1002		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		993	Accept ± 2.0
AP Port (Internal)	+800 mB	800	Accept ± 5.0
	+1200mb	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	-29.8	Accept ± 3.0	-347	-346	Accept ± 50
-3	-3.0	Accept ± 1.0	-17	-17	Accept ± 6.0
0	0.0	Accept ± 0.0	0	0	Accept ± 0.5
3	3.0	Accept ± 0.5	15	15	Accept ± 3.0
30	30.2	Accept ± 3.0	358	364	Accept ± 50
60	59.8	Accept ± 6.0	1083	1082	Accept ± 130
90	94.3	Accept ± 9.0	2350	2350	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:
<i>Jack Rutland</i>

Date Tested:
<i>14/07/2025</i>

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.

Gas Data Ltd is certified to BS EN ISO9001:2015, BS EN ISO14001:2015, BS EN ISO45001:2018.



APPENDIX E

NOTES ON LIMITATIONS

Notes on Limitations For Geoenvironmental and Geotechnical Consultancy Services

General

This document has been prepared by CC GEOTECHNICAL LTD within the terms of the contract, scope of work, and resources agreed in writing with the client. The limitations of liability of CC GEOTECHNICAL LTD for the contents of this document have been agreed with the Client, as set out in the terms and conditions of offer and related contract documentation.

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The findings and opinions provided in this document are made in good faith and are subject to the limitations imposed by employing site assessment methods and techniques, appropriate to the time of investigation and within the limitations and constraints defined in this document.

The findings and opinions are relevant to the dates when the assessment was undertaken, but should not necessarily be relied upon to represent conditions at a substantially later date. In particular, seasonal groundwater levels, with the effects of precipitation, may affect the conditions found during the investigation. The report should be read in conjunction with the further Notes on Limitations included in Appendix A.

Where opinions expressed in this report are based on current available guidance and legislation, no liability can be accepted by CC GEOTECHNICAL LTD for the effects of any future changes to such guidelines and legislation. Additional information, improved practices, new guidance, changes in legislation, or amendments to design proposals, may necessitate this report having to be reviewed in whole or in part after that date. Opinions and interpretations are not accredited by UKAS.

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1. the consequences of this document being used for any purpose or project other than for which it was commissioned and/or
2. the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by the timescale available, and the locations of the exploratory holes may have been restricted to areas unoccupied by the building(s) on the site, and further restricted by the existence of buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out to provide sufficient information within the agreed scope of the investigation, under the general headings of type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.