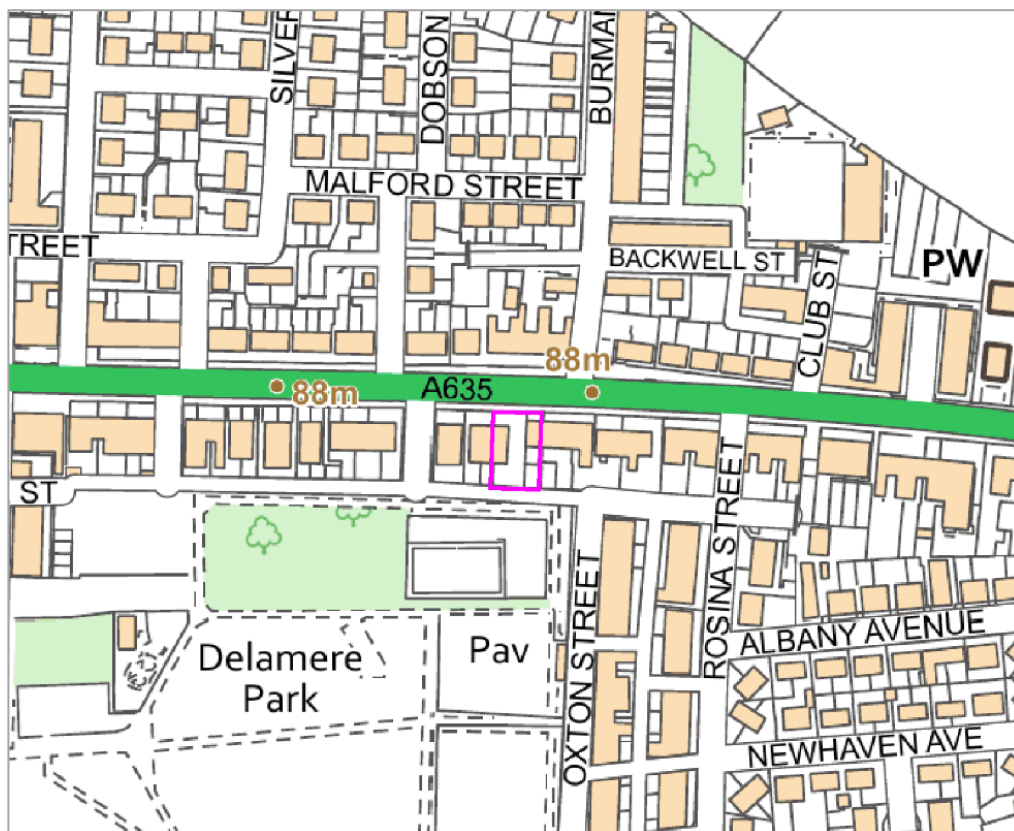


Carley Daines and Partners Limited

Consulting Civil and Structural Engineers

1468 ASHTON OLD ROAD
OPENSHAW
MANCHESTER M11 1HH



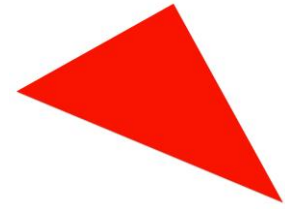
SUPPLEMENTARY REPORT ON GAS MONITORING UNDERTAKEN FOR MSV HOUSING

Ref:23-B-13881

Revision '0'

23rd February 2024

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
VAT Number: **285 0439 91**



SUPPLEMENTARY REPORT ON GROUND GAS MONITORING, PROPOSED DEVELOPMENT AT 1468 ASHTON OLD ROAD, MANCHESTER M11 1HH

INTRODUCTION AND OBJECTIVES

Reference should be made to the Geo-Environmental Report dated 16th October 2023.

This supplementary report deals strictly with ground gas monitoring issues, together with recommendations for the mitigation thereof, in respect of the proposed development.

A full set of ground gas monitoring results were not available at the time of writing the previous report.

GROUND GAS MONITORING

Ground gas monitoring was undertaken at the site with 2 boreholes converted to gas monitoring wells.

Ground gas measurements were undertaken on 6 occasions between 26th September 2023 and 6th December 2023. A full set of results are included in Appendix A.

The concentration by volume of methane (CH₄) varied with a maximum concentration of 0.5%.

The concentration by volume of carbon dioxide (CO₂) was also found to vary, with a maximum concentration of 5.3%.

Peak gas flow was recorded at 0.7 litres/hr.

Measurements were undertaken in a variety of atmospheric pressure conditions varying between 989 and 1012 bars.

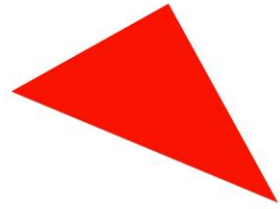
Equipment used was a GA5000 infra red gas analyser, complete with flow pod.

CONCLUSIONS

Reference should be made to the table included in Appendix B. This is based upon Table 6.4 – NHBC Classification for Low Rise Housing (Boyle & Witherington, 2007; CIRIA, 2006), contained in Ground Gas Handbook by Wilson, Card & Haines.

Gas monitoring for methane indicated a maximum value of 0.5%. Combining this with a maximum flow of 0.7 litres/hr gives a GSV of 0.004, falling within the “Green” category.

Gas monitoring for carbon dioxide indicated a maximum concentration of 5.3% and when combined with a maximum recorded flow of 0.7 litres/hr gives a GSV of 0.04. This is considered to fall into the



"Amber 1" category as the concentration of 5.3% exceeds the 5% upper limit of the "Green" category.

The Phase 1 PRA indicated the site as being in an area unaffected by Radon.

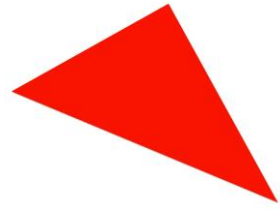
RECOMMENDATIONS

Gas protection measures are recommended to the new property to an "Amber 1" level.

SIGNED

A handwritten signature in blue ink, appearing to read 'D.J. Middleton', with a horizontal line underneath.

D.J. MIDDLETON
CARLEY DAINES & PARTNERS LIMITED



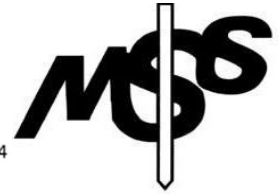
APPENDIX A
GAS MONITORING RESULTS

MINI • SOIL • SURVEYS

MINI SOIL SURVEYS (NORTH) LTD

Unit 30 Atlantic Business Centre, Atlantic Street, Broadheath, WA15 5NQ

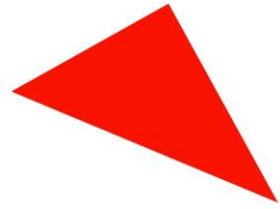
Tel: 0161 980 0044



Gas Monitoring – 1468 Ashton Old Road

Date	BH	CH4%	CO2%	O2%	Press	Flow l/h	Weather/Temp
26/09/2023	1	0.5	5.3	18.0	1003	0.4	12°C Clear
12/10/2023	1	0.5	4.9	17.3	1003	0.4	12°C Sunny/Clear
25/10/2023	1	0.1	5.1	18.7	989	0.7	8°C Clear
07/11/2023	1	0.0	4.6	17.6	1003	0.6	10°C Overcast/Raining
23/11/2023	1	0.0	4.2	17.9	1012	0.5	12°C Overcast/Windy
06/12/2023	1	0.0	4.8	17.4	1008	0.6	0°C Clear / Frosty

Date	BH	CH4%	CO2%	O2%	Press	Flow l/h	Weather/Temp
26/09/2023	2	0.2	4.9	17.9	1004	0.3	12°C Clear
12/10/2023	2	0.3	4.5	17.1	1008	0.6	12°C Sunny/Clear
25/10/2023	2	0.0	4.2	17.9	989	0.7	8°C Clear
07/11/2023	2	0.0	3.9	17.8	1002	0.6	10°C Overcast/Raining
23/11/2023	2	0.0	2.8	17.6	1012	0.5	12°C Overcast/Windy
06/12/2023	2	0.0	4.5	17.9	1008	0.6	0°C Clear / Frosty

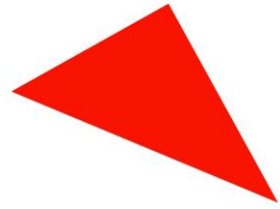


A P P E N D I X B

NHBC CLASSIFICATION TABLE

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
VAT Number: **285 0439 91**

NHBC classification for low rise housing (150 mm void) (Boyle & Witherington, 2007; CIRIA, 2006)				
Traffic Light Classification	Methane		Carbon dioxide	
	Typical maximum concentration (%v/v)	Gas screening value (l/h)	Typical maximum concentration (%v/v)	Gas screening value (l/h)
Green				
	1	0.16	5	0.78
Amber 1				
	5	0.63	10	1.56
Amber 2				
	20	1.56	30	3.10
Red				



APPENDIX C
SUMMARY OF GAS MONITORING

Summary of gas monitoring					
Methane			Carbon dioxide		
Typical maximum concentration (%v/v)	Flow (l/h)	Gas screening value	Typical maximum concentration (%v/v)	Flow (l/h)	Gas screening value
0.5	0.7	0.004	5.3	0.7	0.04

CERTIFICATION OF CALIBRATION



Date Of Calibration: 21-Dec-2020

Certificate Number: G501677_2/27146

Issued by: QED Environmental Systems Ltd.

Customer: Mini Soil Surveys (Northern) Ltd
12 Beech Walk Leigh Lancashire
WN7 3LH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G501677

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.1	0.072
15.0	15.1	0.13
60.0	59.7	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.7	0.074
15.0	14.6	0.13
39.9	40.0	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.4	21.5	0.25

The inwards assessment was carried out 08-Dec-2020.

The maximum adjustment is larger than the inwards assessment uncertainty.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 32.7 °C ± 2.5 °C

O₂ readings recorded at : 24.1 °C ± 2.5 °C

Barometric Pressure : 0990 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:111 IGC Instance:111

Page 1 of 2 | LP015GIUKAS-2.4

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: 21-Dec-2020

Certificate Number: G501677_2/27146

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
990	991

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	5.2
10.0	10.3

Date of Issue : 22-Dec-2020

Approved by Signatory

Nick Sidgwick

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:111 IGC Instance:111

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