

Carley Daines and Partners Limited

Consulting Civil and Structural Engineers

**DOWNLEY DRIVE
MANCHESTER
M4 7JU**



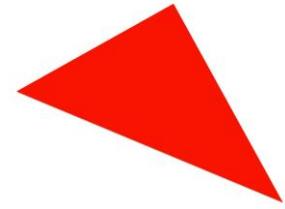
**SUPPLEMENTARY REPORT ON GAS MONITORING
UNDERTAKEN FOR
GREAT PLACES HOUSING ASSOCIATION**

Ref:19-B-12490/Downley Drive

Revision '0'

9th March 2021

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 DOWNLEY DRIVE, MANCHESTER, M4 7JU

INTRODUCTION AND OBJECTIVES

Reference should be made to the Geo-Environmental Report dated 25th January 2021.

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 4 boreholes converted to gas monitoring wells.

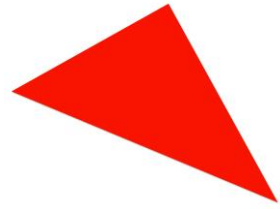
Ground gas measurements were undertaken on 6 occasions between January 2021 and March 2021. A full set of results are included in Appendix A.

The concentration by volume of methane (CH₄) was zero on all occasions.

The concentration by volume of carbon dioxide (CO₂) was found to vary, with a maximum concentration of 3.7%.

Measurements were undertaken in a variety of atmospheric pressure conditions varying between 974 and 1029 bars. The maximum recorded flow was 0.4 litres/hr. This flow coincided with a concentration of CO₂ of 4.0%.

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



RECOMMENDATIONS

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.

The gas screening values taken from the worst-case site measurements are zero for methane, falling within the "green" category.

Gas monitoring for carbon dioxide indicated a maximum concentration of 3.7% and when combined with a flow of 0.4 litres/hr gives a GSV of 0.015. This is considered to fall into the "Green" category.

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

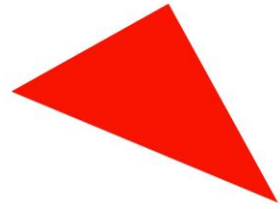
Therefore, it is considered that ground gas protection measures are not required.

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

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
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MINI · SOIL · SURVEYS



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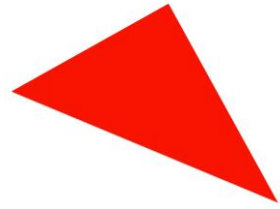
Tel: (01942) 269769
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GAS MONITORING

SITE:- Downley Drive Manchester

Date	BH No	CH4%	CO2%	O2%	l.e.l. %	Press mb	Flow l/hr	Weather/Temp
06/01/21	1	0.0	2.3	17.5	0.0	1018	0.2	Dry, clear 1deg.
	4	0.0	0.3	20.5	0.0	1018	0.2	Pressure rising
	6	0.0	3.7	15.3	0.0	1018	0.2	
	8	0.0	2.9	16.1	0.0	1018	0.3	
21/01/21	1	0.0	0.2	21.4	0.0	974	0.4	Overcast 2deg
	4	0.0	1.3	20.0	0.0	974	0.4	Pressure rising
	6	0.0	2.8	17.1	0.0	974	0.3	
	8	0.0	3.0	16.3	0.0	974	0.4	
04/02/21	1	0.0	0.6	20.8	0.0	988	0.3	Dry, clear 2deg
	4	0.0	1.1	20.5	0.0	988	0.3	Pressure steady
	6	0.0	2.9	16.8	0.0	988	0.3	
	8	0.0	2.7	16.2	0.0	988	0.2	
19/02/21	1	0.0	0.4	21.1	0.0	996	0.2	Overcast 8deg.
	4	0.0	2.2	18.4	0.0	996	0.2	Pressure rising
	6	0.0	2.4	18.9	0.0	996	0.3	
	8	0.0	2.6	16.1	0.0	996	0.2	
05/03/21	1	0.0	1.1		0.0	1029	0.3	Dry, clear 5deg
	4	0.0	0.4		0.0	1029	0.2	Pressure rising
	6	0.0	2.6		0.0	1029	0.3	
	8	0.0	2.4		0.0	1029	0.3	
19/03/21	1	0.0	1.5	19.0	0.0	1027	0.2	Light rain 8deg
	4	0.0	0.3	20.9	0.0	1027	0.2	Pressure rising
	6	0.0	2.8	15.8	0.0	1027	0.2	
	8	0.0	2.1	18.0	0.0	1027	0.2	

Instrument GA5000

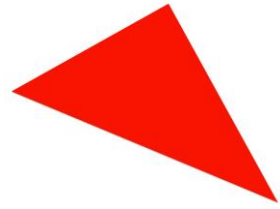


A P P E N D I X B

NHBC CLASSIFICATION TABLE

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
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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				



A P P E N D I X C

S U M M A R Y O F G A S M O N I T O R I N G

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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	0	0	3.7	0.4	0.015