

# Carley Daines and Partners Limited

Consulting Civil and Structural Engineers

DALTON AVENUE  
FALLOWFIELD  
MANCHESTER M14 7NR



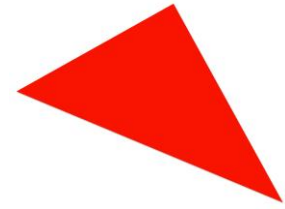
## SUPPLEMENTARY REPORT ON GAS MONITORING *UNDERTAKEN FOR* MSV HOUSING

Ref:22-B-13509

Revision '0'

22<sup>nd</sup> 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 SITE AT DALTON AVENUE, MANCHESTER M14 7NR**

### **INTRODUCTION AND OBJECTIVES**

Reference should be made to the Geo-Environmental Report dated 2<sup>nd</sup> 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 26<sup>th</sup> September 2023 and 6<sup>th</sup> December 2023. A full set of results are included in Appendix A.

The concentration by volume of methane (CH<sub>4</sub>) varied with a maximum concentration of 0.4%.

The concentration by volume of carbon dioxide (CO<sub>2</sub>) was also found to vary, with a maximum concentration of 10.1%.

Peak gas flow was recorded at 0.8 litres/hr.

Measurements were undertaken in a variety of atmospheric pressure conditions varying between 994 and 1018 bars. The maximum recorded flow was 0.8 litres/hr.

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

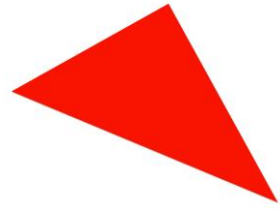
### **CONCLUSIONS**

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 0.4%. Combining this with a maximum flow of 0.8 litres/hr gives a GSV of 0.003., falling within the “Green” category.

Gas monitoring for carbon dioxide indicated a maximum concentration of 10.1% and when combined with a maximum recorded flow of 0.8 litres/hr gives a GSV of 0.08. This is considered to fall into the

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"Amber 2" category as the concentration of 10.1% exceeds the 10% upper limit of the "Amber 1" category.

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

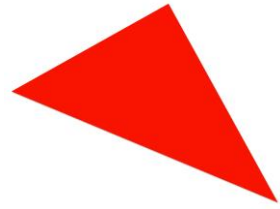
#### **RECOMMENDATIONS**

Gas protection measures are recommended to new properties to an "Amber 2" 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**



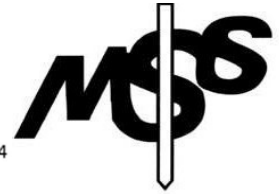
**APPENDIX A**  
**GAS MONITORING RESULTS**

# MINI • SOIL • SURVEYS

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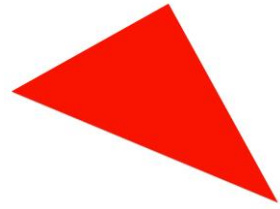
Tel: 0161 980 0044



## Gas Monitoring – Dalton Avenue

| Date       | BH | CH4% | CO2% | O2%  | Press | Flow l/h | Weather/Temp          |
|------------|----|------|------|------|-------|----------|-----------------------|
| 26/09/2023 | 1  | 0.4  | 4.6  | 17.2 | 1010  | 0.4      | 12°C Clear            |
| 12/10/2023 | 1  | 0.3  | 1.9  | 18.5 | 1009  | 0.6      | 12°C Sunny/Clear      |
| 25/10/2023 | 1  | 0.2  | 1.3  | 18.9 | 994   | 0.7      | 8°C Foggy             |
| 07/11/2023 | 1  | 0.2  | 1.9  | 18.8 | 1008  | 0.7      | 10°C Overcast/Raining |
| 23/11/2023 | 1  | 0.2  | 2.0  | 18.7 | 1018  | 0.8      | 12°C Overcast/Windy   |
| 06/12/2023 | 1  | 0.1  | 1.7  | 19.4 | 1014  | 0.7      | 0°C Clear / Frosty    |

| Date       | BH | CH4% | CO2% | O2%  | Press | Flow l/h | Weather/Temp          |
|------------|----|------|------|------|-------|----------|-----------------------|
| 26/09/2023 | 3  | 0.3  | 10.1 | 16.5 | 1010  | 0.4      | 12°C Clear            |
| 12/10/2023 | 3  | 0.2  | 7.2  | 17.7 | 1010  | 0.6      | 12°C Sunny/Clear      |
| 25/10/2023 | 3  | 0.0  | 5.4  | 17.9 | 995   | 0.7      | 8°C Foggy             |
| 07/11/2023 | 3  | 0.0  | 6.8  | 17.8 | 1008  | 0.6      | 10°C Overcast/Raining |
| 23/11/2023 | 3  | 0.2  | 5.5  | 18.0 | 1018  | 0.6      | 12°C Overcast/Windy   |
| 06/12/2023 | 3  | 0.0  | 6.9  | 18.4 | 1015  | 0.7      | 0°C Clear / Frosty    |

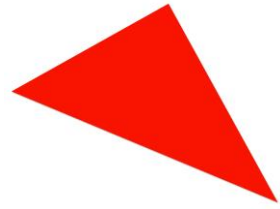


## **A P P E N D I X   B**

### **NHBC CLASSIFICATION TABLE**

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| <b>NHBC classification for low rise housing (150 mm void)</b><br><b>(Boyle &amp; Witherington, 2007; CIRIA, 2006)</b> |                                      |                           |                                      |                           |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------|--------------------------------------|---------------------------|
| 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 |
| 0.4                                  | 0.8        | 0.003               | 10.1                                 | 0.8        | 0.08                |