

Hinckley Leisure Centre – Ground Gas Assessment Report

Site Investigations



Geologists



Environmental &
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Engineers



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Green4Planning

Date: 6th October 2025

GROUND GAS RISK ASSESSMENT

Former Leisure Centre, Hinckley M25-040/GAS

Dear Sirs

INTRODUCTION

Authorisation

Solmek were instructed by Green4Planning to undertake a site investigation on a parcel of land at The Former Hinckley Leisure Centre LE10 0BY. A drawing showing the position of the site is included in Appendix A (Figure 1).

Sources of information, including previous work undertaken at the site, are detailed below:

- *Solmek Phase 1 Desk Study, Former Hinckley Leisure Centre (M25-040) March 2025*
- *Solmek Phase 2 Site Investigation, Former Leisure Centre, Hinckley (M25-040) August 2025*

Reference should be made to the above report for details of the site's history, environmental/contamination setting and expected underlying geological conditions.

Scope of Works

The proposed development comprises a series of residential units including semi-detached housing, apartments and a care home. All units are to have associated parking and soft landscaping.

The information provided in this Ground Gas Assessment is based on the investigation fieldwork and is subject to the comments and approval of the various Regulatory Authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

GROUND GAS ASSESSMENT

Ground gases such as carbon dioxide (CO₂) and methane (CH₄) can be classed as a form of contamination where there is a potential risk to human health. As a result, gas monitoring has been undertaken. Six visits have been carried out between August 2025 and October 2025 to assess the potential risks posed by ground gases.

The gas was monitored by measuring emissions from monitoring points installed into BH1, BH3 and CP01 during the fieldwork. However, it was discovered during the first monitoring visit (08/08/2025) that CP01 had been vandalised beyond repair, and therefore was unable to be used for monitoring. Figure 2, appended to this letter report, shows the borehole locations.

The monitoring was generally carried out in accordance with current guidance provided within CIRIA C665:2007. The results are attached to this letter report.

Ground Gas Results

The atmospheric pressure has an impact on the concentrations of gas released. The atmospheric pressure ranged between 998 and 1011 millibars during the surveys. Times of falling and rising atmospheric pressure regional trends were noted during the survey. This is considered to be a good range of conditions for the time of year.

- Methane was not detected.
- Carbon dioxide concentrations were recorded between 0.10 and 0.50% (peak).
- Oxygen levels were between 18.50 and 20.00% (steady) with oxygen depletion (<19.0%) noted in BH01 on the final monitoring visit.
- No significant flow rates were recorded.

Ground Gas Analysis

The results obtained have been compared with relevant guidance that includes the following:

- BRE/Environment Agency BR414 (2001) – Protective Measures for Housing on Gas-Contaminated Land
- Wilson & Card (1999) – Reliability and Risk in Gas Protection Design
- CIRIA 149 (1995) – Protecting Development from Methane
- CIRIA C665 (2007) – Assessing Risks Posed by Hazardous Ground Gases to Buildings.
- BS8485 (2015) + A1 (2019) – Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings

The Building Regulations set action levels for both methane and carbon dioxide from which an initial assessment can be made. The action threshold for methane is 1% while for carbon dioxide an initial consideration should be undertaken if gas concentrations exceed 1.5%. Action might be required if carbon dioxide concentrations exceed 5%. If these thresholds are exceeded, reference should be made to specific documentation to determine the nature and extent of the gas control measures required.

A Characteristic Situation ranking of between 1 and 6 is given based on the ground gas monitoring results coupled with the gas flow rate. These combined produces a Gas Screening Value (GSV). Where no flow is recorded a flow rate of 0.1l/hr is assumed. The GSV and risk classification define the characteristic situation, which are comparable to the table below, taken from CIRIA C665, and derived from CIRIA R149 shown in Table 1 below.

CIRIA R149 GAS REGIMES

Characteristic Situation (CS)	Risk Classification	Gas Screening Value CH ₄ or CO ₂ (l/hr)	Additional Factors
1	Very Low Risk	<0.07	CS1 where CH ₄ is <1% and/or CO ₂ is <5%, Otherwise increase to CS2
2	Low Risk	<0.7	
3	Moderate Risk	<3.5	
4	Moderate to High Risk	<15	
5	High Risk	<70	
6	Very High Risk	>70	

The worst case GSV can be taken from the highest flow rate recorded over the visits (0.1l/hr) along with the greatest volume of CO₂ (0.50%). Based on these figures the worst GSV has been calculated as 0.0005(l/hr). The gas screening values from the monitoring visits would place the site in **Characteristic Situation (CS) 1**.

A series of tables adapted from **BS:8485** are attached to the rear of this letter. The type of building and gas protection level generate a minimum gas protection points score, in this case a private building (Type A) combined with CS2 has a score of **0 points**. In this case no ground gas protection is required for the development. However, given the low oxygen levels extra ventilation could be considered.

No radon protection measures are required, based the comments in the Phase 1 Desk Study Report.

Yours sincerely,



L Richards
On behalf of Solmek Ltd.

APPENDIX A



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Figure Title

Site Location Plan

Project Number

M25-040

Project Name

Former Leisure Centre, Hinckley

Client

Green4Planning

Date

October 2025

DRG Number

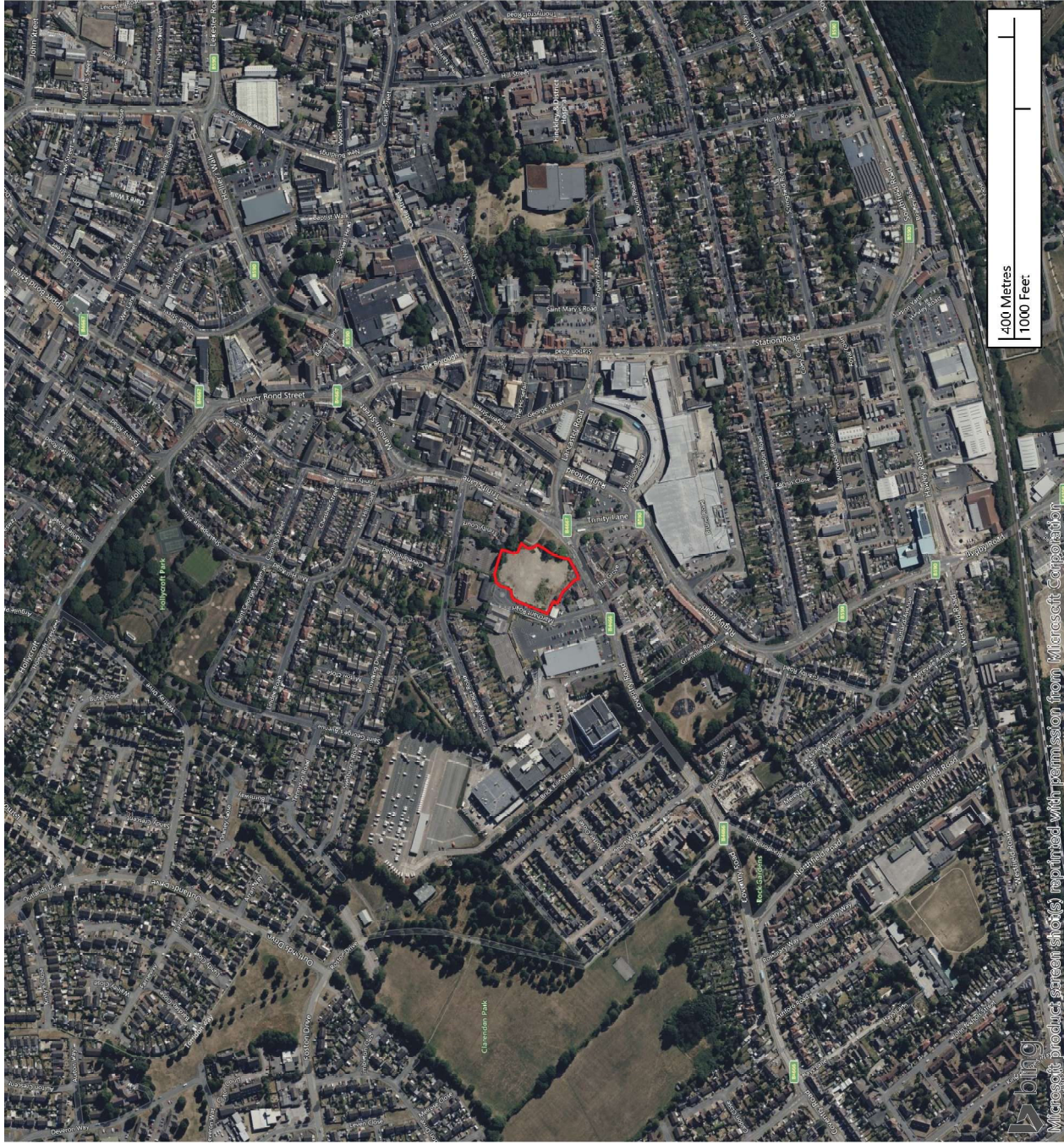
Figure 1

Scale

1:8500 @ A4 [DO NOT SCALE]

Legend Key

 Project Bounds - Project Bounds





12-16 Yarm Road, Stockton on Tees, TS18 3NA
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Figure Title

Location Plan

Project Number

M25-040

Project Name

Former Leisure Centre, Hinckley

Client

Green4Planning

Date

October 2025

DRG Number

Figure 2

Scale

1:1000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - Empty
- Locations By Type - BH
- Locations By Type - CP
- Project Bounds - Project Bounds



APPENDIX B



GAS MONITORING RESULTS

Project number	M25-040
Project name	Former Hinkley Leisure Centre
Client	Green4Planning
Visit no	1
Date	08/08/2025
Equipment	GFM 435 Gas Analyser
Operator	LR

Weather Conditions	Sunny
Ground Conditions	Dry
Ambient Atmospheric Pressure	1000
Regional Pressure Trend	Steady

Position	Flow (l/hr)	Pressure	CH4			CO2			O2		PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)						
BH01	0.1	1000	0.0	0.0	0.0000	0.3	0.2	0.0003	20.2	19.3	N/A	0.0	0.0	1.55	3.30	
BH03	0.1	1000	0.0	0.0	0.0000	0.2	0.1	0.0002	20.1	20.0	N/A	0.0	0.0	N/A	4.60	

KEY

CH₄ = Methane, CO₂ = Carbon Dioxide, O₂ = Oxygen, CO = Carbon Monoxide, H₂S = Hydrogen Sulphide, GSV = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.



GAS MONITORING RESULTS

Project number	M25-040
Project name	Former Hinkley Leisure Centre
Client	Green4Planning
Visit no	2
Date	14/08/2025
Equipment	GFM 435 Gas Analyser
Operator	LR

Weather Conditions	Sunny
Ground Conditions	Dry
Ambient Atmospheric Pressure	998
Regional Pressure Trend	Falling

Position	Flow (l/hr)	Pressure	CH4			CO2			O2		PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)						
BH01	0.1	998	0.0	0.0	0.0000	0.2	0.2	0.0002	19.2	19.0	N/A	0.0	0.0	1.4	3.30	
BH03	0.1	998	0.0	0.0	0.0000	0.4	0.4	0.0004	19.0	19.0	N/A	0.0	0.0	N/A	4.60	

KEY

CH₄ = Methane, CO₂ = Carbon Dioxide, O₂ = Oxygen, CO = Carbon Monoxide, H₂S = Hydrogen Sulphide, GSV = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.



GAS MONITORING RESULTS

Project number	M25-040
Project name	Former Hinkley Leisure Centre
Client	Green4Planning
Visit no	3
Date	20/08/2025
Equipment	GFM 435 Gas Analyser
Operator	LR

Weather Conditions	Sunny
Ground Conditions	Dry
Ambient Atmospheric Pressure	1008
Regional Pressure Trend	Rising

Position	Flow (l/hr)	Pressure	CH4			CO2			O2		PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)	GSV (l/hr)	Peak (% v/v)	Steady (% v/v)						
BH01	0.1	1008	0.0	0.0	0.0000	0.3	0.2	0.0003	20.0	19.4	N/A	0.0	0.0	1.42	3.30	
BH03	0.1	1008	0.0	0.0	0.0001	0.5	0.3	0.0005	20.1	19.6	N/A	0.0	0.0	N/A	4.60	

KEY

CH₄ = Methane, CO₂ = Carbon Dioxide, O₂ = Oxygen, CO = Carbon Monoxide, H₂S = Hydrogen Sulphide, GSV = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.