

Barrow Hill Quarry, Mill Lane, Earl Shilton
Our Ref: 26726-GEO-0402
Ground Gas Protection Measures Technical Note
June 2025

Introduction

This technical note has been prepared by MEC Consulting Group Ltd (MEC) on behalf of AT Contracting and Plant Hire Limited (the Client), and on the instruction of Lion Planning (the Agent), to further review the ground gas risk at the above site. A site location plan is included in **Appendix A**.

This technical note has been prepared to support the discharge of Condition 5, allocated to the planning application by Hinckley & Bosworth Borough Council, ref: 21/01390/FUL, which states the following:

No development approved by this permission shall be commenced until a scheme for gas protection on the site has been submitted to and agreed in writing by the Local Planning Authority which shall include details of how any landfill gas shall be dealt with. The approved scheme shall be implemented in accordance with the agreed details and any remediation works so approved shall be carried out prior to the site first being occupied.

Proposals

The proposed development is to comprise 21 holiday lodges and an ancillary management building in the north-west, with associate infrastructure and balancing/attenuation basins. A proposed development plan is included in **Appendix B**.

Existing Relevant Site Information

The following report, prepared by MEC should be read in conjunction with this Technical Note:

- Phase I Desk Study Report Ref: 26726-04-DS-01 Rev.A dated June 2023; and
- Phase II Ground Investigation Report Ref: 26726-04-GI-01 Rev.A dated June 2023.

Disclaimer

MEC has completed this technical note for the benefit of the Client, the Agent, and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this technical note unless explicit written approval has been gained from MEC.

MEC does not accept responsibility or liability for:

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- b) The issue of this document to any third party with whom approval for use has not been agreed.

This technical note should be read in its entirety, including all associated drawings and appendices. MEC cannot be held responsible for any misinterpretations arising from the use of extracts of this technical note that are taken out of context.

Selected findings and opinions conveyed within this technical note are based on information obtained from external sources, as detailed within the previous reports, which MEC believes are reliable. All reasonable care and skill have been applied in examining the information obtained, nevertheless MEC cannot and does not guarantee the authenticity or reliability of the information it has relied upon from external sources.

Recommendations made or opinions expressed in the technical note are based on the exploratory hole records and ground gas monitoring from the previous investigation. Liability cannot be accepted for conditions not revealed by the exploratory holes, particularly between positions. Whilst every effort is made to ensure accuracy of data supplied, any opinion expressed as to the possible configuration of strata between or below investigation locations is for guidance only and responsibility cannot be accepted as to its accuracy.

The comments on groundwater and ground gases are based on observations made at the time of the investigation and during the subsequent monitoring programme. It should be noted; however, that groundwater levels and ground gas concentrations may vary from those reported due to seasonal or other effects.

Site Description and History

The site comprises undeveloped open scrub land crossed by gravel tracks, covers an area of approximately 2.86ha, and was formerly occupied by a quarry. The site is generally split over two levels, comprising lower and upper sections in the east and west respectively. A quarry high wall face is exposed on the northern boundary, with Mill Lane immediately beyond. The site is covered with areas of presumably self-seeded semi mature trees and shrubs.

In the late 1880's, Barrow Hill Quarry was recorded in the east, which had expanded further west by the 1950's. In the 1960's, the quarry was recorded as disused with spoil heaps mapped in the north-east, east and along the southern boundary, and a pond occupied the base in the east. By the 1980's the eastern pond was no longer mapped, and a new pond occupied the western and central areas of the quarry. Recent aerial photography indicates that the quarry had been at least partially infilled by the mid 1980's and the pond was no longer present.

Intrusive Investigation and Recorded Ground Conditions

An intrusive ground investigation was completed by MEC in 2021 and included the drilling of six dynamic windowless sampler borehole locations (WS10-WS06) to depths of up to 5.00m bgl.

The investigation encountered Made Ground to the full depth of the investigation (5.00m bgl) reflecting the infilling of the former quarry. Natural strata were not encountered as penetration to greater depth was restricted by the thickness of the Made Ground and the presence of concrete obstructions within three locations advanced in the west of the site (WS04 at 4.00m bgl, WS05 at 0.90m bgl and WS06 at 3.00m bgl).

The Made Ground comprised granular fractions of dark brown and yellowish brown silty gravelly fine to medium sand, and cohesive fractions of soft brown mottled blue and orange, sandy gravelly clay. The gravels comprised sub-angular to angular, fine to coarse, brick, chalk, quartzite, ash, glass, sandstone, bituminous material, clinker, flint, chalk, concrete, and wood fragments.

Black staining and a strong hydrocarbon odour were noted within soils from four of the six locations (WS01, WS02, WS03, and WS06).

Ground Gas Summary and Risk Assessment

Ground gas monitoring was completed on six occasions between 3rd December 2021 and 17th January 2022, and the results are presented in **Appendix C**. During two of the visits, atmospheric pressure was recorded below 1000mb and under falling and static conditions. Generally, ground gas emissions increase when atmospheric pressure falls, particularly below 1000mb. On this basis the worst-case gassing scenario was captured by the monitoring. The results are summarised in Table 1 below.

Table 1: Summary of Ground Gas Results

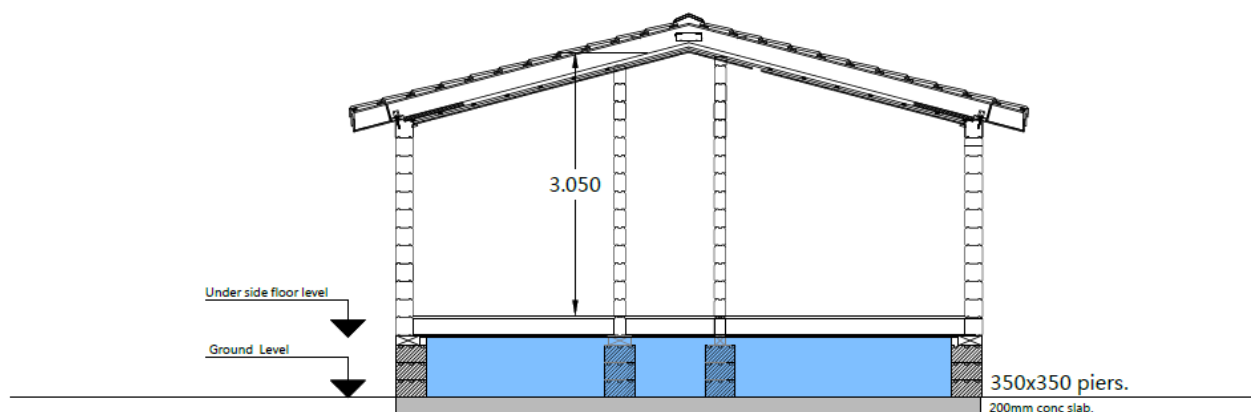
Location	Maximum Methane Concentrations (% v/v)	Maximum Carbon Dioxide Concentrations (% v/v)	Maximum Flow Rates (l/hr)	Maximum GSV(l/hr)
WS01	<0.1	0.5	0.6	0.0606
WS02	<0.1	10.1	0.1	
WS03	<0.1	4.3	<0.1	
WS04	7.2	2.0	0.3	
WS06	6.6	7.1	0.1	

A maximum GSV of 0.0606 l/hr was calculated in accordance with BS8485:2015+A1:2019 based on the maximum recorded gas flow rate and carbon dioxide concentration. This would typically place the site within Characteristic Situation 1 (CS1); however, given that concentrations of both carbon dioxide and methane exceeded 5% and 1%

respectively it was considered that an increase to CS2 would be required for traditional development.

The development proposals comprise lodges or mobile homes, which would typically not require sub-surface foundations, and would be placed upon concrete slabs or plinths with open underfloor ventilation above. This will mitigate the accumulation of hazardous ground gas, and therefore negate the requirement for protection measures within the proposed structures. Site specific construction details are not currently available; however, a typical detail provided by the Agent is presented in Figure 1 below:

Figure 1: Typical Lodge Construction Details



On this basis, Condition 5 associated with the planning application approval can be discharged as gas protection measures will not be required for the current proposed development.

If any ground bearing structure is proposed for the site, or if there is assessed to be a potential for ground gases to accumulate in enclosed areas beneath the buildings, ground gas protection measures will be required in accordance with BS8485 to satisfy CS2 conditions.

REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
June 2025	-	First issue	Jimesh Mistry MSci MSc FGS Geo-Environmental Engineer	Christopher Wall MSc BSc (Hons) AMIEEnvSc RSoBRA Associate Geo-Environmental	David Torrance BSc (Hons) CGeol FGS Director

Appendices

- A. Site Location Plan
- B. Proposed Site Plan
- C. Ground Gas and Groundwater Monitoring Results

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APPENDICES



APPENDIX A



SITE LOCATION PLAN

Project: Barrow Hill Quarry, Mill Lane, Earl Shilton
File Ref: 26726
O.S. Grid Ref: 448809 297112
Postcode: LE9 7TR





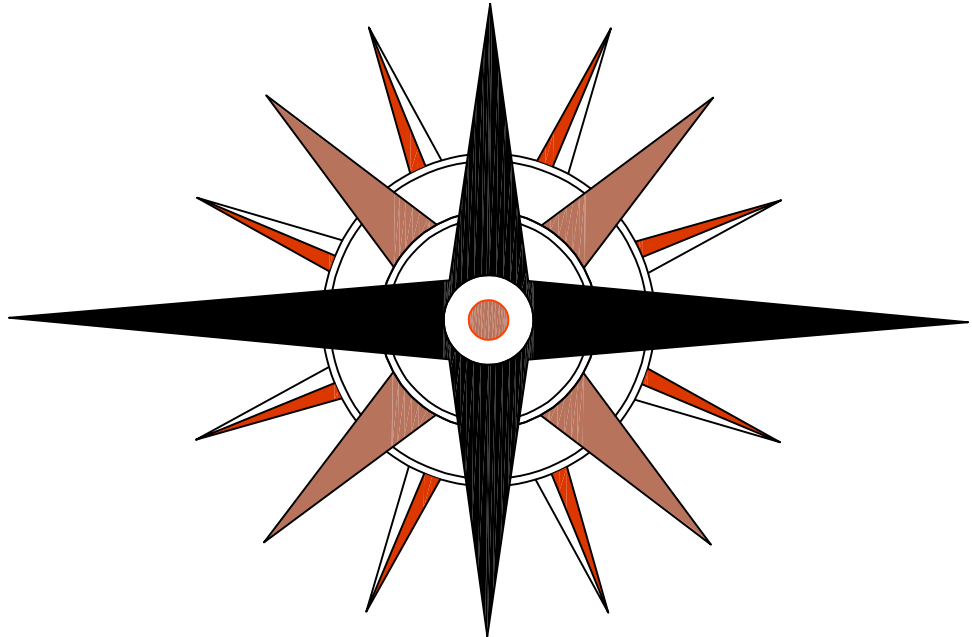
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APPENDICES



APPENDIX B

N



D Balancing ponds indicated. 22/1/21

Barrow Hill Quarry
Earl Shilton

Plans

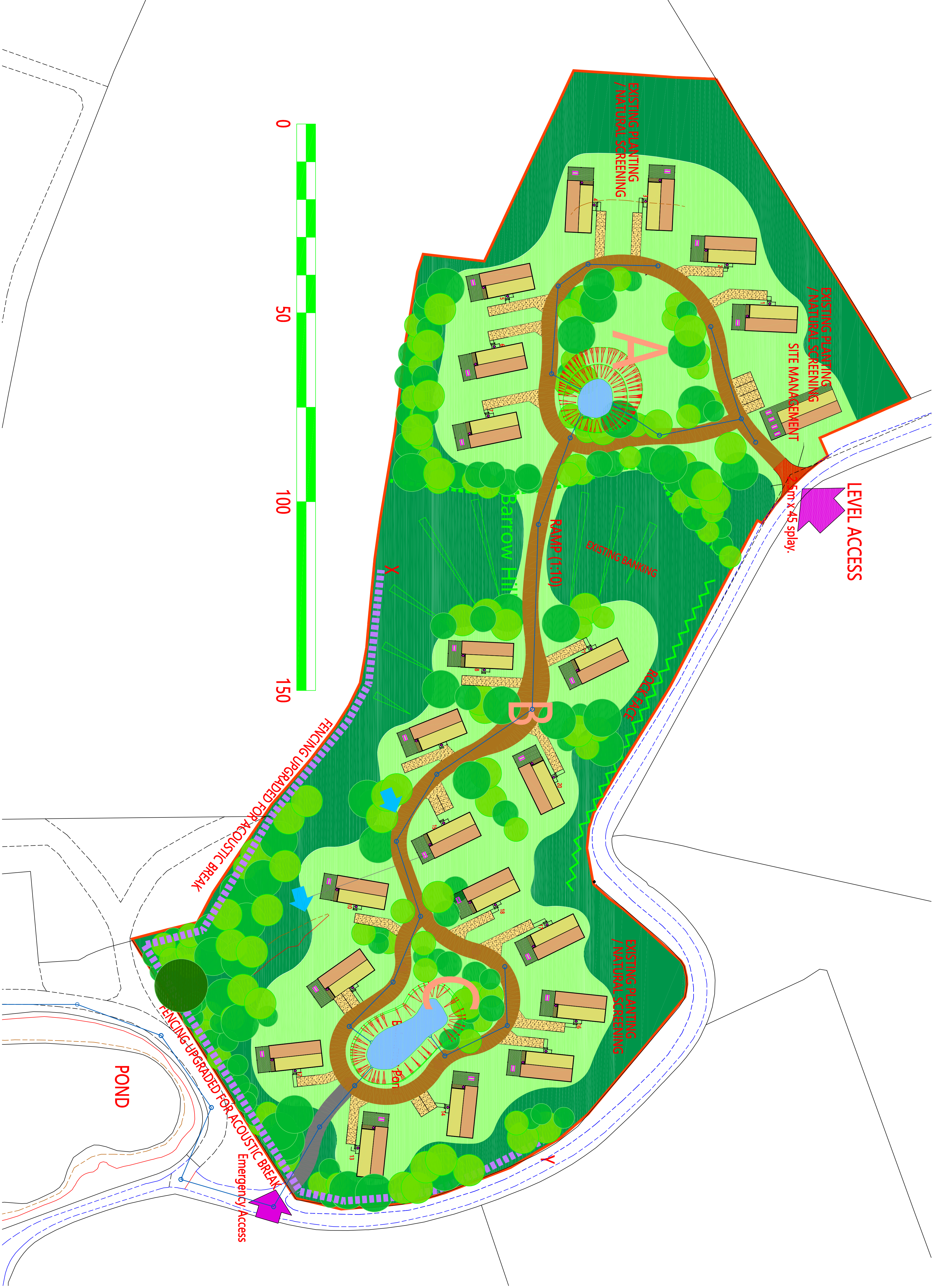
Scale.	1:500@ A1	Date.	Oct 2021
Dwg No.	1001	Revision.	D

Brook House Consulting

BHC

72 Boston Road
Leicester
LE4 1HB

Landscape indicative only





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APPENDICES



APPENDIX C

GAS AND GROUNDWATER MONITORING

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		03 December 2021
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

NR = Not Recorded
Dry = No Groundwater

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Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	8	8
Wind Strength (m/s)	NR	NR
Wind Direction (from)	NR	NR
Temperature (°C)	10.0	10.0
Barometric Pressure (mb)	992	989
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

[illegible]

GAS AND GROUNDWATER MONITORING

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		06 December 2021
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	Heavy Rain	Rain
Cloud Cover (Oktas)	8	8
Wind Strength (m/s)	2.3	1.6
Wind Direction (from)	NR	NR
Temperature (°C)	4.0	4.0
Barometric Pressure (mb)	997	997
(Rising/ Falling)	Static	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

[illegible]

NR = Not Recorded
Dry = No Groundwater

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NR = Not Recorded
Dry = No Groundwater

Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	6	6
Wind Strength (m/s)	1.1	1
Wind Direction (from)	NR	NR
Temperature (°C)	13.0	13.0
Barometric Pressure (mb)	1012	1011
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		15 December 2021
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

[illegible]

GAS AND GROUNDWATER MONITORING

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	0	0
Wind Strength (m/s)	0.3	0.5
Wind Direction (from)	NR	NR
Temperature (°C)	5.0	5.0
Barometric Pressure (mb)	1004	1004
(Rising/ Falling)	Static	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		06 January 2022
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

[illegible]

NR = Not Recorded
Dry = No Groundwater

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NR = Not Recorded
Dry = No Groundwater

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		13 January 2022
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	0	0
Wind Strength (m/s)	0.2	0.2
Wind Direction (from)	NR	NR
Temperature (°C)	4.0	4.0
Barometric Pressure (mb)	1031	1027
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

[illegible]

GAS AND GROUNDWATER MONITORING

Site:		Barrow Hill Quarry
Client:		AT Contracting & Plant Hire Limited
Job No.:		26726
Date:		17 January 2022
Start / End Time:		NR
Engineer:		CC
Monitoring Equipment:	Gas Meter ID	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	0	0
Wind Strength (m/s)	NR	NR
Wind Direction (from)	NR	NR
Temperature (°C)	6.0	5.0
Barometric Pressure (mb)	1029	1027
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	NR	NR

[illegible]

SITE WIDE		GSV	
Maximum Carbon Dioxide Concentration (steady)	10.1 %	0.0606	(CO₂)
Maximum Methane Concentration (peak)	7.2 %	0.0432	(CH₄)
Maximum Flow Rate	0.6 l/hr	0.0606	(worst)
NHBC	Amber 2		
Characteristic Situation (W&C)	2		

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