

Ground Gas Technical Note

Land off Cotswold Dene, Standlake, Witney, OX29 7PL

Presented to: **Infoteam International**

Delta-Simons Report Number: 91624.611606

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01	Final	14/03/2024				
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1.0 Introduction

Delta-Simons has been instructed by Infoteam International Services Limited (the "Client") to provide a ground gas addendum technical note to support planning discharges of an area of land off Cotswold Dene, Standlake Business Park, Witney, OX29 7PL (the "Site").

The Site is subject to planning application 23/00301/FUL by West Oxford District Council and this report relates specifically to the following condition;

- 1. *No development shall take place until a site investigation of the nature and extent of contamination has been carried out in accordance with a methodology which has previously been submitted to and approved in writing by the local planning authority. The results of the site investigation shall be made available to the local planning authority before any development begins. If any significant contamination is found during the site investigation, a report specifying the measures to be taken to remediate the site to render it suitable for the development hereby permitted shall be submitted to and approved in writing by the local planning authority before any development begins.*

The following previous site-specific Delta-Simons reports have been submitted -

- Geo-Environmental Assessment Report, Land off Cotswold Dene, Lakeside Industrial Estate, Standlake, Witney, OX29 7PL (ref.21-2605.01). Dated 9th March 2022.
- Updated Preliminary Geo-Environmental Risk and Ground Gas Assessment Report, Land off Cotswold Dene, Standlake Business Park, Witney (ref 91624.559141). Dated 8th March 2023.

The Client has reliance on both reports.

It is understood from liaison with the Planning Officer at West Oxford District Council that further assessment of the ground gas potential at the Site was required in order to discharge the planning condition. A supplementary two rounds of monitoring was agreed with the Council prior to undertaking the works.

Although no significant sources of ground gas had been identified in the previous assessments of the Site, Delta-Simons understands that the Council had concerns regarding a record about an adjacent historic landfill (c.20m south-east) and history of infilled gravel pits in the surrounding area.

Following the first of the supplementary visits in 2024, only one of the monitoring wells was viable and only one round has been undertaken due to the limited additional data. As such, this technical note has been written to provide an updated ground gas assessment summary using all the lines of evidence in line with current guidance (e.g. NHBC, 2023).

2.0 Ground Gas Monitoring Data

2.1 Geo-Environmental Assessment Report, March 2022

Delta-Simons initial ground investigation was completed from 8th to 10th February 2022, with a subsequent two rounds of ground gas monitoring undertaken at roughly weekly intervals thereafter.

Ground conditions were found to comprise Made Ground (both cohesive and granular) overlying the Summertown-Radley Sand and Gravel Member (sands and gravels) and the bedrock of the Oxford Clay Formation. The depth to groundwater was encountered between 73.24 and 74.16 AOD within the Made Ground / Summertown-Radley Sand and Gravel Member.

The location of the monitoring positions are included within Figure 1 and the results of the monitoring are included within appendix B.

The results are summarised in the below table:

Location	Maximum Steady Methane (%v/v)	Maximum Steady Carbon Dioxide (%v/v)	Maximum Steady Flow Rate (l/hr)	GSV/Classification				Flooded?
				Methane		Carbon Dioxide		
				GSV	Classification	GSV	Classification	
DS101	<0.1	3.1	<0.1	0.0001	CS1	0.0031	CS1	N
DS102	<0.1	7.2	<0.1	0.0001	CS1	0.0072	CS2	N
DS103	<0.1	0.8	<0.1	0.0001	CS1	0.0008	CS1	N
DS105	1.2	6.6	<0.1	0.0012	CS1	0.0066	CS1	N
DS107	<0.1	8.0	<0.1	0.0001	CS1	0.008	CS2	N

The highest recorded concentration of methane is 1.2%v/v in DS105 though below detection in all other locations. The highest carbon dioxide concentration is 8%v/v within DS102. However, steady flow rates are considered to be negligible as below the limits of equipment detection on both monitoring events.

Made Ground soils were generally found to contain low organic content, with soil organic matter ranging from 1.2 – 7.8%.

The preliminary data indicated that the Site be provisionally classified as a Characteristic Situation 2, and further ground gas monitoring was recommended to provide further assessment for design purposes and in line with the requirements of CIRIC 665 for a commercial development which requires c. four visits.

2.2 Updated Preliminary Geo-Environmental Risk and Ground Gas Assessment, March 2023

Delta-Simons undertook an updated Geo-Environmental Risk Assessment for the Site in March 2023, which included an additional two rounds of ground gas monitoring to confirm the findings of the in investigation in line with CIRIA 665.

The two further rounds of ground gas monitoring were undertaken on 28th February & 3rd March 2023, and the results are included within Appendix B.

A summary of the results is included within the below table:

Location	Maximum Steady Methane (%v/v)	Maximum Steady Carbon Dioxide (%v/v)	Maximum Steady Flow Rate (l/hr)	GSV/Classification				Flooded?
				Methane		Carbon Dioxide		
				GSV	Classification	GSV	Classification	
DS101	<0.1	1.7	<0.1	0.0001	CS1	0.0017	CS1	N
DS102	<0.1	4.4	<0.1	0.0001	CS1	0.0044	CS1	N
DS103	<0.1	1.5	<0.1	0.0001	CS1	0.0015	CS1	N
DS105	<0.1	4.4	<0.1	0.0012	CS1	0.0044	CS1	N
DS107	<0.1	5.0	<0.1	0.0001	CS1	0.005	CS1	N

No recordings of steady state flow or methane above the equipment level of detection (0.1l/hr & 0.1%v/v) were identified during the two monitoring visits. However, initial recordings of flow recorded flow rates up to 1.0l/hr were recorded within DS101. This is likely due to the opening effect of ground gas wells which had been sealed for a year and are not considered to reflect steady state conditions. The highest carbon dioxide concentration is 5%v/v within DS107 which was consistent with the findings of the initial assessment. Groundwater was encountered to rest between 1.32 and 2.18m bgl.

Based on the results of the initial and additional monitoring (four visits total), the Site was therefore recommended to be classified as a Characteristic Situation 1, based on the absence of steady state flow rates and CO₂ rates not being sustained (subject to regulatory approval).

2.3 Ground Gas Addendum Monitoring, January 2023

Delta-Simons complete further ground gas monitoring at the Site following liaison with West Oxford District Councils Planning Officer.

An initial visit was completed on 26th January 2023. During the visit, only one of the original positions was found to be serviceable.

The result of the monitoring is summarised below and included within appendix B.

Location	Maximum Steady Methane (%v/v)	Maximum Steady Carbon Dioxide (%v/v)	Maximum Steady Flow Rate (l/hr)	GSV/Classification				Flooded?
				Methane		Carbon Dioxide		
				GSV	Classification	GSV	Classification	
DS103	<0.1	2.1	<0.1	0.0001	CS1	0.0021	CS1	N

Negligible steady state flow rates / methane concentrations (0.1l/hr & 0.1%v/v) were recorded within DS103 during the visit, with steady state CO₂ recorded at 2.1%v/v.

The results of the monitoring are broadly similar to historical monitoring of the borehole which indicated recordings of flow rates / methane below the equipment's limit of detection and CO₂ <5.0%v/v, indicative of a Characteristic Situation 1.

3.0 Commentary

Delta-Simons has completed ground gas monitoring at the Site on a total of five occasions between 8th February 2022 and 26th January 2024.

Combined ground gas monitoring data indicates that negligible steady state flow rates are present around the Site (none recorded above the equipment's limits of detection (0.1 l/hr) on any visit). Additionally, methane concentrations have only been recorded within one borehole on one visit in 2022.

No significant ground gas generating soils or soils with significant organic content were encountered during the ground investigation works.

The conceptual site model outlined in the previous Delta-Simons report had not identified any significant source of ground gas generation on-site, however it is understood that the Councils concerns were

regarding an adjacent historical landfill (located c.20m south-east) and history of infilled gravel pits in the surrounding area.

A Local Authority registered landfill for aircraft oils, builders scrap metals and plastics is recorded to the south-east, this is noted to be very small (along the site of a former track) and unlikely to be significantly gas generating. This has not been observed on any historical mapping. A licensed waste management facility present to the east (waste transfer station – Adler and Allen) is considered likely to be related to a scrap yard adjacent to the east of the Site along with a Waste Transfer Station (relating to Standlake Waste Oil Storage Facility – Adler and Allen). This land use is unlikely to result in any significant ground gas risks given the above ground nature of the works and site hardstanding.

Older gravel pits in the surrounding area date back to at least 1970's with limited records of domestic landfilling observed. The closest putrescible landfill is located circa 100m to the north (noting that boundaries are approximate on mapping) which differs from EA historical landfills located further to the north. For potential former gravel pits at closer proximity to the north-east with unknown infill, as stated within the NHBC ground gas guidance, features of this age are unlikely to be producing significant ground gas.

No evidence of ground gas generation or significant flow from these off-site features have been recorded at levels on-site which are considered to be a risk during the ground gas monitoring to date. All flows have been negligible on-site which is reflective of the variably cohesive Made Ground (with low organic content) recorded on-Site, limiting the risk of lateral migration of any potential gases onto Site. Shallow groundwater within the River Terrace Deposits with the strata was found to be partially saturated with clay bands which is considered to limit the likelihood of lateral migration from off-Site sources.

It should be noted that the surrounding land to the south and west of the Site comprises open agricultural land (which is considered to be freely venting) and the proposed development has areas of soft landscaping, as such ground gas impact from off-site sources if present, are not likely to [preferentially] migrate to buildings on-site.

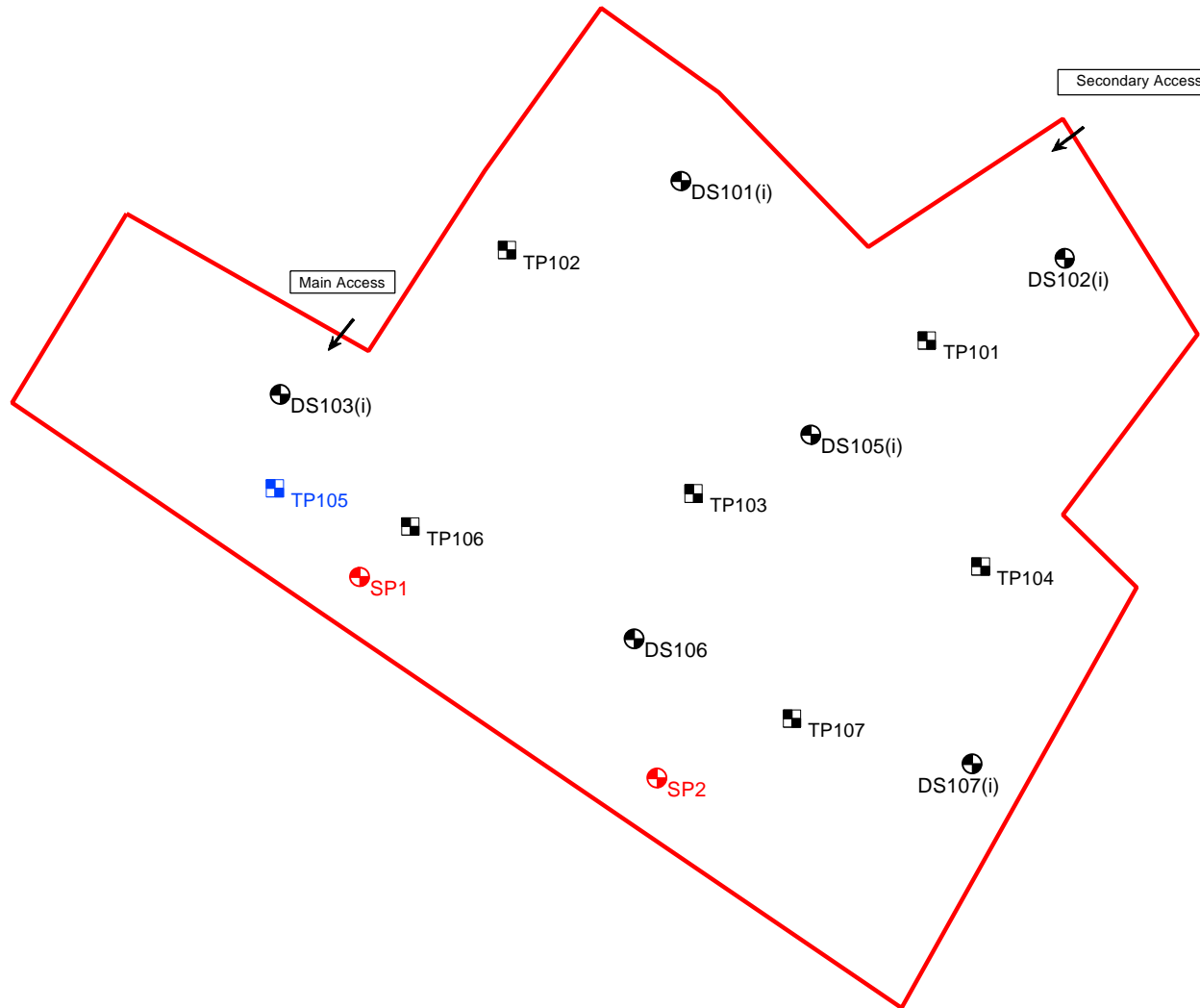
4.0 Conclusions

Based on the above, and in the context of the proposed development (low risk commercial development with soft landscaping), we believe that the ground gas generation risk at the Site is low given the absence of any significant flow on-site, and further monitoring would not be necessary to further our current assessment.

Ground gas data collected to date indicates that a Characteristic Situation 1 classification for the Site would be suitable for design purposes, subject to regulatory approval.

Figures

Figure 1 – Exploratory Location Plan



LEGEND	
	Site Boundary
	DSx Dynamic Sampler Borehole
	TPx Trial Pit
	Trial Pit Targeting Bund in South of Site
	SPx Stockpile Sampling Location

Bing maps

Appendices

Appendix A – Limitations

Limitations

This Report was prepared by Delta-Simons Ltd (Delta-Simons) for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. Delta-Simons does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Delta-Simons. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Delta-Simons' Standard Terms and Conditions as included within our proposal to the Client.

The recommendations contained within this Report represent Delta-Simons professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the Report.

Where Delta-Simons has obtained, reviewed and evaluated information in preparing this Report from the Client and others and Delta-Simons conclusions, opinions and recommendations has been reasonably determined using this information, Delta-Simons does not warrant the accuracy of the third-party information provided to it and cannot be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

Site surveys document the conditions encountered at the time of survey only and conditions may change due to natural processes or human intervention. As such, surveys represent an assessment at a specific point in time and Delta-Simons cannot be responsible for adverse conditions which arise or become apparent after the time of the survey or for conditions which sit outside the scope for which the survey or Report was commissioned.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work period and on the results of laboratory and field tests performed during the investigation. Ground conditions are inherently variable such that no investigation can be exhaustive to the extent that all adverse conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed or obtained as part of this assessment. It should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions. Where risk assessment is undertaken, this is based upon the standards, guidance and common practice at the time of the assessment and Delta-Simons cannot be responsible for conditions which become apparent following changes in guidance or practice or advancements in scientific knowledge which change the position in relation to assessment of risk.

No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

Where budgets are prepared and presented within the Report, these are for information only to indicate the likely magnitude of a cost and do not represent an invitation to treat for the works. All budgets and programmes presented should be reviewed and verified by appropriately qualified and experienced independent Project Managers and Cost Consultants.

Appendix B – Ground Gas Monitoring Data

