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CONSULTING STRUCTURAL, CIVIL & GEOTECHNICAL ENGINEERS

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LAND OFF FARLEIGH HILL

MAIDSTONE

KENT

ME15 6RQ

GROUND GAS MANAGEMENT PLAN

November 2020
Revision 1

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Report Status: FINAL		Date of Issue: November 2020
		Signature
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CONTENTS

SITE PLANS

APPENDICES

LAND OFF FARLEIGH HILL
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KENT
ME15 6RQ

GROUND GAS MANAGEMENT PLAN

1. INTRODUCTION

This document proposes guidance for the appropriate management of ground gas which may be encountered during and following completion of redevelopment of the above site.

For the purpose of this report, the proposed development site known as Tovil Quarry or Land off Farleigh Hill is referred to as *the subject site*. The former KCC landfill to the south west is referred to as Tovil Landfill.

The subject site has seen a number of phases of intrusive Site investigation dating back to 2004, with associated laboratory testing of representative samples. The most recent investigation occurred in December 2019. These previous investigations are listed below and have been described at length and issued as Attachments to earlier documents, including Knapp Hicks & Partner's Remediation Strategy (March 2020) and subsequent documents submitted to the Environment Agency in support of an application for a Waste Recovery Permit.

It may be noted that several phases of investigation and associated testing within this site have indicated that it is generally lacking in contamination which would represent a risk to the developer and the end-user and it has been proposed that any remediation may be of a routine nature, i.e. validated clean imported cover soils placed on top of existing site-won soils.

As part of these previous investigations it has been demonstrated that there are no potential sources of ground gas contained within the site boundaries.

The principal potential source of ground gas affecting the site is Tovil Landfill located alongside and to the south west.

The most relevant documents are listed below and have previously been issued.

Details of appropriate remedial measures are provided in the afore-mentioned Remediation Strategy Document and the following documents are also available on request.

1	Tovil Quarry, Site Sub-surface Conditions & Reclamation Method Statement, Liverpool Environmental Engineering Consultants Ltd, May 2006
2	Farleigh Hill, Tovil, Maidstone, supplementary Site Investigation & Review of Site Information, Knapp Hicks & Partners Limited, September 2013
3	Farleigh Hill, Tovil, Maidstone, Interim Report on Remediation Works to July 2017
4	Stockpiles Characterisation Table, 2019
5	Trial Pit & Monitoring information, Tovil Quarry, Farleigh Hill, Maidstone, Letter Reference 27686/L/012A/G/RJM, 20th January 2020
6	Supplementary Ground Gas Monitoring and Groundwater Quality Test Results, to February 2020 (See Note (a)below)

7	Tovil Closed Landfill Site, Maidstone, Environmental Monitoring Summary, prepared by Waterman Limited on behalf of Kent County Council Waste Management
8	Earthworks Specification, Knapp Hicks & Partners, 2017* *See also Document 11 (below) and Note (b) (below)
9	Ground Contamination Review, Remediation strategy and Implementation Plan. Land off Dean Street, Burial Ground Lane, Maidstone, for Fernham Homes Limited, Prepared by Land & Environment, September 2013.
10	Topographical Survey, May 2019 (site unchanged since this date) & Isopachyte drawings showing existing vs proposed levels.
11	Construction Quality Assurance Report, Ground Gas Barrier, Southern Boundary, Land off Farleigh Hill, Maidstone, Kent, ME15 6RQ, Reference 27686G.L.016.RJM, July 2020
Notes	
(a)	Updated monitoring results to October 2020 are appended to this report. This includes Gas Screening Values (GSV's) calculated in accordance with CIRIA C665 (2007) – Assessing Risks from Hazardous Ground Gases. Characteristic Situation Classes are also included, calculated in accordance with BS8485:2015 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
(b)	The 2017 Earthworks Specification included a Specification for a Ground Gas Barrier to be installed along the length of the boundary between the subject site (Tovil Quarry) and the adjoining Landfill Site to the South West. The construction of the Ground Gas Barrier has been documented in full in a Construction Quality Assurance Report prepared by Knapp Hicks & Partners Limited, dated July 2020 (Document 11 above)

2. BACKGROUND

2.1 Introduction

The subject site is located on the southern side of Farleigh Hill, Tovil approximately 2km south west of Maidstone town centre. The centre of the site is at approximate grid reference TQ752541.

The site is roughly 'L' – shaped and approximately 300m by 220m at its largest dimensions, the entrance to the site is off Farleigh Hill. There are a number of temporary site buildings located adjacent to the site entrance, along with an area set aside for plant storage and another for car parking. There are no other buildings located on the site.

A proportion of the site area is occupied by stockpiles and these are described in Reference 4 which includes historical testing.

A more recent set of test results for each stockpile is also provided in Reference 5.

2.2 Review of Site History

Dates	Use
1884	Agricultural land.
1897 – 1958	Quarrying for building stone.
1950 – 1976 (approximately)	Backfilling with refuse including ash, domestic refuse and paper pulp.
1980 – late 1990's	Fuel depot on the north western corner.
1992	Tipped soils re-excavated and recycled.
2000	Extensive remodelling, re-excavation and recycling.
2002	Low area on northern eastern side was infilled.
2010- 2014	Overspill of domestic refuse excavated and screened to remove unsuitable deposits.
2017-2018	Installation of gas barrier between subject site and adjacent KCC site (Refer Document 11 above)

2.3 Geology

The 1:50,000 Geological Map (Sheet No. 288, Maidstone) indicates the site geology to be Hythe Beds (Sandstone and Limestone) with a band of Atherfield Clay running south-west to north-east across the centre of the site. No superficial deposits are recorded.

Previous investigations proved Hythe Beds strata overlain by significant depths, in excess of 20m, of Made Ground. The Made Ground was present as two layers comprising landfill waste overlying inert site-derived Quarry Waste Materials (mix of natural ragstone, and hassock - a silty sandy clayey by-product of ragstone quarrying).

The Quarry Waste material is generally quite well compacted and Standard Penetration test N Values from previous investigations (See Appendix A) generally indicate that they are medium dense or better.

Further information on the geology and the make-up of the filled ground is provided in References 1 & 2 above.

2.4 Groundwater

The Hythe Beds are classified as a Major Aquifer, and groundwater is expected to flow in a northerly direction towards the River Medway. The underlying Atherfield Clay is a Non-Aquifer.

Based on existing records the site does not lie within a groundwater abstraction zone.

Groundwater has been recorded at various times in a number of boreholes across the site from 25.7mbgl to 36mbgl. Recent monitoring and testing is provided in References 5 & 6.

Where the Atherfield Clay was exposed in the deepest excavations in the site, the groundwater was generally located only as a slow inflow at the top of the clay so it appears that there is little groundwater flow passing through the site.

2.5 P J Burke (KENT) Ltd Works to construct a Ground Gas Barrier

The site is bound to the south west by a Kent County Council (KCC) owned historic landfill that is currently occupied by an open field.

On the south western boundary a near vertical face marked the boundary with the adjoining KCC landfill. This was approximately 19m high at its maximum and a 1m to 19m height of landfill waste was exposed along the boundary. During 2017, PJ Burkes installed a landfill gas barrier along the length of this boundary, consisting of an engineered earth bund placed against the KCC landfill waste with a continuous gas membrane installed by Butek along the length of the bund and anchored into natural ground at its base and anchored at the top into the upper surface of the earth bund. A rubble filled venting trench was installed to depths of up to 6m to the KCC landfill side of the gas membrane.

2.6 Site Levels Topography

The levels across the site vary considerably, however the site generally slopes down from the south and west towards the north and east.

The most recent topographic survey was carried out in 2019 and no further earthworks or related activites have been carried out since the topographical survey in May 2019 (Ref. 10).

A copy of this survey is appended to this report and another drawing is provided showing the proposed residential development. Lines have been added to these above drawings which illustrate the distance from the gas bund / site boundary relative to the proposed development.

2.7 Gas Monitoring at KCC Historic Landfill

KCC continue to monitor a number of gas wells installed in the adjacent landfill. The following information is derived from a recent report (November 2019) on monitoring of the landfill:

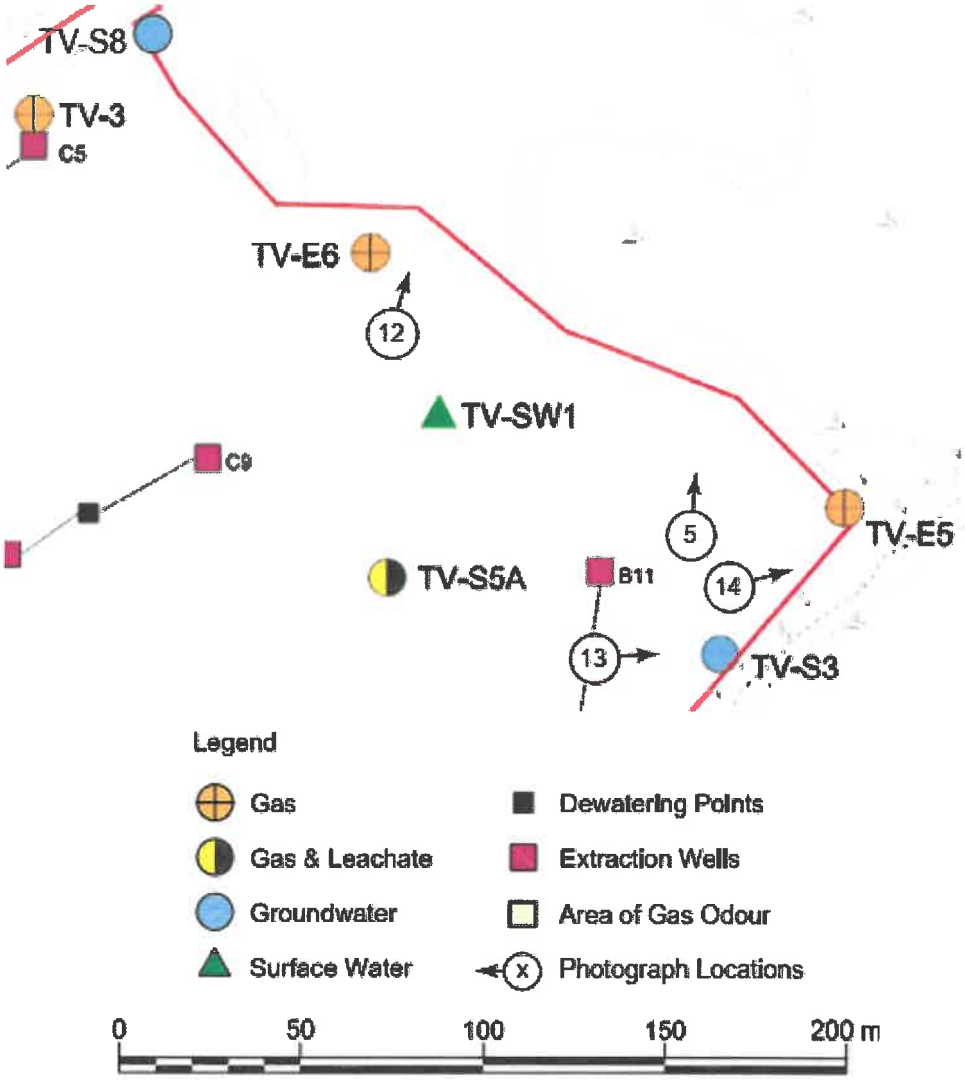
- Two combined ground gas and leachate monitoring wells installed in the waste on the northern Site half (TV-S5A) and southern half (TV-S4A), and one ground gas monitoring borehole (TV-E2) for the purposes of monitoring the ground gas generation of the landfill waste;
- Twelve monitoring wells on the western Site boundary monitoring the landfill gas migration off the western Site boundary (TV-4 – TV-9, TV-S6, TV-S7, TV-E7 – TV-E9).
- Three monitoring wells on the northern Site boundary monitoring the landfill gas migrating off the northern Site border (TV-3, TV-E6, TV-E5).
- Two monitoring wells on the eastern boundary monitoring the landfill gas migrating off the eastern boundary (TV-E3 – TV-E4).
- Two monitoring wells in the south western Site corner monitoring the landfill gas migrating off the southern boundary (TV-E1, TV-2).

Landfill gases are extracted from the Site using a flare on the western boundary which is fed by three lines.

The most relevant of these wells to the PJ Burke site are as follows:

Ground Gas: TV-3, TV-E6 & TV-E5

Groundwater: TV-S3 & TV-S8



The following monitoring information has been provided by KCC:

Borehole	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Comments
Western Boundary				
TV-3 (2m)	<0.1	<0.1 – 1.8	21	Near Atmospheric
Northern Boundary				
TV-E5	0.1 – 0.5	2.4 – 16.4	2.6 – 17.8	Variable
TV-E6	<0.1 – 0.2	<0.1 – 0.7	21 - 22	Near Atmospheric

2.8 KCC Gas Monitoring at adjacent closed Tovil Landfill site (2019-2020)

KCC (Reference 7) have prepared a risk assessment based upon their ongoing monitoring results and this is reproduced below. It can be seen that their assessment of risk rating to property adjoining their site is generally Low, and this is because there is little evidence of significant lateral migration of ground gas.

Table 6: Conceptual Site Model

Source	Receptor	Potential Transport Pathways	Associated Hazard	Probability	Potential Consequence	Risk Classification	Comments
Landfill Gas	Human health	Lateral migration through the ground and build up in buildings	Asphyxiation Explosion	Unlikely	Severe	Moderate/low	Evidence of significant lateral ground gas migration has not been recorded.
		Vertical migration through landfill capping	Headaches, shortness of breath	Unlikely	Minor	Very low	A SES should be completed during the following EMS period to quantify the risk.
	Flora and fauna on site	Vertical migration through landfill capping	Toxicity	Likely	Minor	Low	
	Property (crops to west of the site)	Lateral migration through the ground	Toxicity	Unlikely	Mild	Very low	Boreholes along western boundary generally do not indicate lateral migration is occurring.
	Property (crops to the east of the site)	Lateral migration through the ground	Toxicity	Low likelihood	Mild	Low	Boreholes along eastern boundary indicate the potential for lateral ground gas migration. The monitoring and assessment of ground gas flow is required to confirm the risk.
	Property (buildings)	Lateral migration through the ground and build up in buildings	Explosion	Unlikely	Mild	Very low	Gas extraction system is effective at controlling lateral landfill gas migration towards the south.
	Global environment	Lateral and vertical migration with release to atmosphere	Greenhouse gas (contribution to global warming)	Likely	Minor	Low	A SES should be completed during the following EMS period to quantify the risk.
Leachate (infiltration through waste and leaching out of base)	Controlled waters (groundwater & River Medway)	Leaching through base of site	Pollution of controlled waters	Likely	Medium	Moderate	Groundwater monitoring point TV-S3 records a significant deterioration in groundwater quality compared to results from TV-S1 and TV-S2 but overall stays within historic ranges.

2.9 Ground Gas Monitoring at Tovil Quarry (Subject site)

Following a review of gas levels reported on the KCC Landfill Site, and discussions with the Local Authority EHO, PJ Burkes installed 5No gas monitoring wells (G1 to G5) within the subject site to facilitate assessment of the ground gas risk to the proposed residential development. The borehole logs and details of the installed gas wells are attached as Appendix A.

Each borehole was located approximately 20m to 30m into the Tovil Quarry site from the exposed top of the completed ground gas barrier which follows the boundary between Tovil Quarry and the adjacent Tovil Landfill. Their locations are plotted on the attached Site Plans.

Monitoring is ongoing and the results of ten monitoring visits to October 2020, carried out at a range of barometric pressures, are attached for reference in Appendix B. Each monitoring visit is accompanied by a set of test results and, for each individual gas reading, we have included a calculated Gas Screening Value (GSV) and equivalent Characteristic Situation (CS). These are discussed in greater detail in Section 4 of this report.

3. CONCEPTUAL SITE MODEL - GROUND GAS

For the assessment of contamination, a risk-based approach is utilised in accordance with the Environment Agency's 'Model Procedures for the Management of Land Contamination' (CLR11). In the development of a conceptual site model, consideration is given to potential sources of contamination, potential targets (receptors) and how the sources and targets may be linked (the pathway). Significant risk due to ground gas will only be considered to exist where a reasonable linkage from the source to target can be identified.

Potential Sources	Potential Pathways	Potential Receptors
On Site Deposits of Made Ground generated from • Historic quarrying i.e. reject quarried materials. • Landfill activities (Note: the various documents referenced in Section 1 of this report have demonstrated that landfill deposits On SITE have been adequately remediated and the potential for ground gas generation has been removed.) *Off Site* The site is located in a mixed setting, and the following potential sources of contamination have been identified by this assessment: • Other historical quarries which have been used as landfills (southern boundary, i.e. Tovil Landfill) or are part filled with quarry waste materials or engineered fill to facilitate development (to south west to other side of Farleigh Hill)	Inhalation of outdoor and indoor dust and vapours. Migration of ground gas through strata. Migration via buried services.	Human receptors in the proposed redevelopment. Neighbouring residents. Construction workers during development. Site structures and utilities.

Table 3.1 – Conceptual Site Model

Information gained from the desk study and historic maps is summarised in the Remediation Strategy and associated documents.

Based on the Conceptual Site Model presented above, and information gained from the earlier investigations, it is considered that risk from ground gas is limited to Tovil Landfill to the south west of the subject site..

4. GROUND GAS RISK ASSESSMENT & SELECTION OF APPROPRIATE GROUND GAS PROTECTION MEASURES

4.1 Earthworks

Details of a proposed engineering methodology for the excavation and re-placement of site won soils to re-profile the site to the proposed landform are available in Reference 8 (2017), prepared by Knapp Hicks & Partners. It is anticipated this will be reviewed and updated as part of the Waste Recovery Plan for the site.

Testing has also indicated that the soils are suitably uncontaminated and that their geotechnical properties are acceptable for use as engineering fill to reprofile the site as suggested above.

Site won materials will be used to re-profile the site, however an import of 9,000 cubic metres will be required to bring the levels up to an approximate formation level of 750mm below the proposed finished ground level.

The remaining 750mm will be made up of hard construction materials (roads, hardstandings, foundations etc) or imported soils for landscaping (See 6.1.2 below).

4.2 Foundations for Proposed Development

The methodology used to calculate the Ground Gas Screening Value for the site is summarised further below and is to be reviewed as the site is re-profiled and as ground gas monitoring continues.

It is anticipated that the proposed reprofiling of the site and associated earthworks will mean that piled foundations will provide the optimum foundation solution for much of this site, particularly the southern portion. Other foundation methods may be considered in due course on condition that appropriate ground gas protection measures can be incorporated to the same standard as proposed.

It is also assumed that vented suspended floor slabs will be adopted for all plots for structural engineering reasons, for example, to take account of the depth of made ground which will exceed 600mm. Ground floors will be constructed in association with the piled foundations, and dimensions of sub-floor void spaces and provision of gas resistant membranes within the ground floor construction will be determined based on the findings of ongoing Ground Gas Risk Assessment and in relation to the relevant Guidance provided in BS8485:2015 (see below).

4.3 Monitoring Visits

Ground gas monitoring is ongoing and has been undertaken at the five representative monitoring locations within the subject site. These are located along the length of the installed Ground Gas Barrier and readings have been taken at a range of barometric pressure from 983mb to 1021mb.

To date, ten gas monitoring visits have taken place as follows:

Visit	Date	Visit	Date
1	3/12/2019	6	22/5/2020
2	12/12/2019	7	5/6/2020
3	10/1/2020	8	9/7/2020
4	11/2/2020	9	2/10/2020
5	21/4/2020	10	27/10/2020

4.4 Ground Gas Risk Assessment - Introduction

The following calculations to assess methane and carbon dioxide ground gas risk are based on the worst measured results obtained to date at the subject site and are considered to be reasonably representative of worst credible gas concentrations. However, monitoring is ongoing and will be continued throughout any forthcoming reprofiling earthworks and therefore the relevant criteria will automatically be reviewed following each monitoring visit and at each stage of the earthworks.

The following assessment is based on the following equation which is taken from BS 8485:2015, *Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. In addition, reference was made to CIRIA Report C735, 2014, *Good Practice on the testing and verification of protection systems for buildings against hazardous ground gases.*

Borehole hazardous gas flow rates (Q_{hg}) have been calculated for assessment of methane and carbon dioxide at the site. These are derived from the measured flow rate of combined gases from the monitoring standpipe (litres/hour) and the measured hazardous gas concentration in percentage volume/volume.

$$Q_{hg}\ (l/hr) = q\ (C_{hg}/100)$$

Qhg - *Borehole hazardous gas flow rate*

q - *Measured flow rates (in litres per hour) of combined gases from the monitoring standpipe*

C_{hg} - *Measured hazardous gas concentration (in percentage volume/volume)*

The gas monitoring has been carried out using acceptable industry standard equipment for routine ground gas monitoring work. The limit of detection of gas flow is 50ml/minute (i.e. 3 l/hr) and the limit of detection for methane and carbon dioxide levels below 5%v/v is 0.5%. Therefore, where gas flow rates are reported as 0 litres/hour we revert to the limit of flow detection or where gas levels below the limit of detection are reported, i.e. <0.5%, we adopt the limit of detection as a more conservative approach.

BS8485:2015 advises that Qhg may be used as the Ground Gas Screening Value (GSV). The GSV is then used to determine a Hazard rating and 'Characteristic Situation' class upon which decisions about ground gas protection measures will be made. This is regarded as an appropriate methodology on condition that the site is close to the potential gas source. However, if the site is located further away from the source then this method can be conservative.

In this instance, we propose to assume the Qhg value as our GSV but the model can be modified as necessary to take account of more of the sites specific characteristics if the result seems overly conservative.

The following Table summarises the GSV ranges upon which Hazard Ratings and Characteristic Situation classes are based.

GSV (Qhg)	Hazard	Characteristic Situation (CS)
<0.07	Very Low	CS1
0.07 to <0.7	Low	CS2
0.7 to <3.5	Moderate	CS3
3.5 to <15	Moderate to High	CS4
15 to <70	High	CS5
>70	Very High	CS6

4.5 Ground Gas Risk Assessment – Selection of Appropriate Protection Measures (BS8485)

BS8485 provides clear guidance on the selection of appropriate Ground Gas Protection Measures and this is summarised below:

1.Select Type of Building
(BS8485 Table 3)
At subject site this means High Risk Property i.e. Type A or Type B (covers all residential buildings)

2.Confirm Gas Protection Score
(BS8485 Table 4)
At subject site confirm Gas Protection Score based on CS Rating
Eg CS1 – requires 0 points
CS2 – Type A and Type B Buildings require 3.5 points
CS3 – Type A buildings require 4.5 points
CS3 – Type B buildings require 4 points

3. Proceed to review points obtained for provision of the following protection measures

3a.Calculate Points for structural barrier (BS8485 Table 5)
e.g. Beam & Block Floor - 0 Points
Cast in situ ground bearing floor slab – 0.5 Points
Reinforced cast in situ suspended floor slab with minimal penetrations – 1 or 1.5 points (depending on reinforcement)

3b.Calculate Points for Ventilation Protection Measures (BS8485 Table 6)
e.g. Pressure relief pathway (low fines gravel layer) – 0.5 points
Passive sub-floor dispersal - 1.5 to 2.5 points (depending on performance)

3c.Calculate Points for Gas Resistant Membrane (BS8485 Table 7)
Gas resistant membrane satisfying BS8485 criteria – 2 points

4.6 Methane Assessment & Appropriate Ground Gas Protection Measures

The peak Methane measured across all 5 boreholes and all monitoring visits to date has been recorded as 3.4%v/v (Borehole G3, Visit 4). The flow was noted to be high during the first three visits (not untypical for fresh installations), but was recorded at 4.1l/hr in BHG3, also during Visit 4.

Therefore, the 4.1l/hr value is used for the following analysis.

Q_{hg} CH_4 = 4.1 x (3.4/100) = 0.1394

By reference to BS 8485:2015, Table 2, if the above Qhg value is adopted as the GSV, the above equation using the worst case results measured to date calculates a **Low** hazard potential (0.07 to <0.7l/h) for methane.

This equates to a Characteristic Situation of CS2 for methane and. based on the proposed development being residential with Type A/B buildings, will require Gas Protection Measures providing a Gas Protection Score of 3.5 or better.

4.7 Carbon Dioxide Assessment & Appropriate Ground Gas Protection Measures

The peak Carbon Dioxide measured across all 5 boreholes and all monitoring visits to date was recorded as 8.7%.v/v (Visit 7, BH G5). The flow was noted to be high during the first three visits, (not untypical for fresh installations), but was also recorded at 8.0 l/hr during the same visit. Therefore these value are used for the following analysis.

Q_{hg} CO_2 = 8.0 x (8.7/100) = 0.696

By reference to BS 8485:2015, Table 2, if the above Qhg value is adopted as the GSV, the above equation calculates a **Low** hazard potential (0.07 to <0.7l/h) for carbon dioxide.
This equates to a Characteristic Situation of CS2 for carbon dioxide and is based on the proposed development being residential with Type A/B buildings, will require Gas Protection Measures providing a Gas Protection Score of 3.5 or better.

4.8 Groundwater Levels

The groundwater levels were also monitored during the visits. No groundwater was encountered within any of the newly installed boreholes which were installed to depths of 6.82 to 7.00mbgl (G1, G2, G3 & G5) and 14.10mbgl (G4). Further details are found on the gas monitoring record sheets in Reference 6.

4.9 Ground Gas Conclusions

Ten monitoring visits have been completed at both high and low barometric pressure. Based on the monitoring data obtained from our visits, the worst case measurements are representative of Characteristic Gas Situation **CS2** due to the low Gas Screening Values derived from the monitoring results, i.e. 0.07 to <0.7 (l/h).

This means that the site has a Low Hazard Potential (BS 8485:2015, Table 2).

Therefore, some gas protection measures are required to be incorporated in the proposed development at the site as the required Gas Protection Score for CS2 is **3.5** (BS 8485:2015 - Table 4). We propose that these measures are installed to all properties located within 250m of the boundary with Tovil Landfill and will comprise of (a) and (b) as described below.

To achieve this score we recommend the following:

(a) Incorporate a gas protection membrane in the ground floor construction, which has a minimum thickness of 0.4mm. This would give a score of **2**.
(b) Incorporate a passive sub floor dispersal layer for a 1.5-2.5 score. We suggest that a **1.5** score is assumed for Good Performance. (Note: A score of 2.5 is possible for Very Good Performance but the feasibility of achieving this score should be reviewed during ground floor design.). Note: We assume this will consist of a clear vented sub-floor void.
(c) The structural barrier for piled properties is likely to be a beam and block floor which give a 0 score. Please refer to Table 5 & BS 8485:2015. A higher specification reinforced cast in situ suspended floor slab with minimal penetrations can score 1 or 1.5 points but, again, the feasibility of this should be reviewed during ground floor design.

However, we propose that properties within 50m of the ground gas barrier should be upgraded to Characteristic Gas Situation CS3. This can be achieved by upgrading the ground floor construction detail as described in Point (c) above.

Appropriate void spaces and exact gas protection details should be specified by the structural engineer appointed to design foundations.

5. GROUND GAS MANAGEMENT PLAN

The ground gas management plan will incorporate the following actions and activities:

- Continued monthly monitoring up to and throughout the remaining earthworks required to re-profile the site. (Approx. 6-8 months)
- Continued monthly monitoring for a period of 6 months following completion of earthworks activities to Formation Ground Levels. This will conclude a total of approximately 24 months of monthly monitoring and, assuming there is no change to the Characteristic Situation, we propose that construction should be able to proceed thereafter.
- A significant proportion of monitoring visits to be carried out at low barometric pressures.
- Review Characteristic Situation following each round of monitoring and advise if there is any increase in Characteristic Situation above CS2.
- Incorporate Ground Gas Protection Measures suitable for Characteristic Situation CS2 in ground floor designs for all property within 250m of Tovil Landfill as indicated in Section 4.9 of this report. The exception to this is where property is located wholly or partly within 50m of Tovil Landfill, where we recommend that Ground Gas Protection Measures are upgraded to CS3 by providing a higher specification reinforced cast in situ suspended floor slab with minimal penetrations.
- Provide validation records for all of the above, including validation of installation of ground gas protection measures to current standards, i.e. BS8485:2015[1] and CIRIA C735[2]. Detailing to be in general accordance with BRE Document BR414[3] on condition that the requirements of the preceding two references are met in full in addition to Architects and/or third party/manufacturers specifications and details for Gas Protection Measures, DPC's and DPM's.

References

[1]BS8485:2015 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
[2]CIRIA C735 – Good Practice on the testing and verification of protection systems for buildings against hazardous ground gases, 2014
[3]BRE Document BR414: Protective Measures for housing on gas-contaminated land

6. VALIDATION & REPORTING

All validation sampling and testing should be undertaken by an appropriately qualified subcontractor using a specialist UKAS accredited testing company.

Monitoring of ground gases should be continued at monthly intervals up to and during the proposed re-profiling of the site up to formation ground level to assess for any changes which occur to the overall ground gas situation on site.

Within areas to be occupied by buildings or general landscaping, a 200mm protective capping layer of 6F2-compliant recycled secondary aggregate is to be placed on top of the formation level. A tolerance of +/-50mm is considered appropriate. This is provided for engineering purposes, but it is considered that this will provide an additional route by which any residual ground gases migrating from the adjacent Tovil Landfill will be dispersed.

A daily site diary of the backfilling and related operations is to be maintained. The following information has previously been specified in the Remediation Strategy:

- Date.
- Prevailing weather conditions including detail of when any earthworks operations were suspended due to inclement weather.
- Records of Materials imported and stockpiled, including details of provenance and chemical testing and any non-compliant materials received
- Details of any unacceptable/unsuitable materials encountered during the earthworks/reprofiling including records for their appropriate disposal.
- Details of all samples dispatched for laboratory testing.
- Volume of material placed compacted and record keeping to demonstrate that adequate compaction has been achieved.
- Daily records of plant operating to carry out the earthworks, and any changes of equipment used, e.g. compaction plant
- Details of field testing including co-ordinates and levels.
- Stockpiles management and details of approvals based on Material Classification Tests.
- Details of any test failures and remedial works completed.

In addition to the above, we recommend the following in relation to Gas Management:

- Records of amendments made to ground gas wells as the ground level is raised.
- Continued monthly readings at representative range of barometric pressures to confirm the Characteristic Situation has not changed.
- Validation Records to demonstrate that Ground Gas Protection Measures, in particular gas membranes have been installed to be compliant with the requirements of BS8485:2015 (Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings) and all related documentation & guidance , including BR414; CIRIA C735; and all Architects and/or specialist third party/manufacturers specifications and details for Gas Protection Measures, DPC's, and DPM's.

This information shall be collated and presented together with all the results of geotechnical field and laboratory testing, in addition to any contamination or other classification sampling undertaken, in the form of a Validation Report. The results of all environmental monitoring undertaken shall also be included.

A further six-month period of monthly ground gas monitoring at a range of barometric pressures is recommended upon completion of the re-profiling to proposed formation levels.

Our assessment of appropriate Ground Gas Protection Measures based on the monitoring results collected to date is included in Section 4.9 of this report. These recommendations should be reviewed as further data is collected.

Further supplementary Validation Reports will be required in due course which should include (a) Construction Quality Assurance (CQA) Inspection Reports and associated site photographs and certificates etc to validate the materials used and workmanship associated with gas protection measure

installation, and (b) Details of all sources of imported subsoil and topsoil, inspection records and laboratory certificates for all verification sampling and testing to confirm the imported soils are suitable for their proposed end-use.

SITE PLANS

- EXISTING TOPOGRAPHY WITH GROUND GAS MONITORING LOCATIONS AND GROUND GAS BARRIER
- PROPOSED DEVELOPMENT LAYOUT WITH GROUND GAS MONITORING LOCATIONS AND GROUND GAS BARRIER

CDM REGULATIONS 2015 RESIDUAL HAZARDS

RESIDUAL HAZARDS IDENTIFIED

CONSTRUCTION

1. THE SITE IS BELIEVED TO BE A FORMER HOUSEHOLD REFUSE TIP. CONTRACTORS AND OTHERS ENGAGED TO WORK ON THE SITE SHOULD BE MADE AWARE OF THE POTENTIAL FOR CONTAMINATED GROUND CONDITIONS AND HAZARDOUS SUBSTANCES.
2. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

FUTURE DEMOLITION

A. THE SITE'S ORIGINAL USE AND ITS POTENTIAL FOR CONTAMINATED OR HAZARDOUS GROUND CONDITIONS SHOULD BE HIGHLIGHED TO THE END USER.
B. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

THIS REGISTER IS A NON-EXHAUSTIVE LIST OF RESIDUAL HAZARDS RELATING TO THE WORKS SHOWN ON THIS DRAWING THAT HAVE BEEN IDENTIFIED DURING THE DESIGN STAGE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A CONTRACTOR WITH THE APPROPRIATE SKILLS, KNOWLEDGE & EXPERIENCE, AND IF THEY ARE AN ORGANISATION, THE ORGANISATIONAL CAPABILITY NECESSARY TO FULFIL THE ROLE.

Historic data provided by Kreap Hicks Consulting Civil, Structural and Geotechnical Engineers.

J.C.White drawing 17/004/03-02 titled 'Orthographic Aerial Image & Level Survey', dated April 2019 has been used to define the existing ground level surface profile.

BHD Architects drawing 2989-PD001-Rev E titled 'Site Plan', dated October 2015 has been used to define the proposed ground surface profile.

Various surfaces were developed from the survey and design information extracted from the above drawings, these are defined below;

EG
Existing ground level defined by the J.C.White survey data.

ASL
No surface strip has been allowed for.

Proposed Finish
Finished surface site profile as defined by the BDH Architects drawing with additional points introduced to define the road profiles and car parks & garden levels interpolated between plots and roads.

Proposed Formation
Formation level (underside) of the permanent works defined by the proposed finished surface level reduced by an assumed 750mm construction thickness.

EG to Formation
Comparison between EG (existing ground level) and Proposed Formation surfaces delivering total volume of cut and fill for the whole site re-grade operation based on assumed construction thickness.

Contours in red at 0.50m intervals represent areas of cut. Contours in blue at 0.50m intervals represent areas of fill. Major contours displayed in light grey at 1.00m intervals and minor contours displayed in dark grey at 0.20m intervals represent existing ground level.

A grid is presented at 25.00m intervals.

No allowance has been made for bulking or compaction

This assessment has been produced based on preliminary and assumed data. A more detailed volumetric assessment from a comprehensive set of proposed levels and construction thicknesses will be required if greater confidence is required in the assessment conclusion.

154300mN
154250mN
154200mN
154150mN
154100mN
154050mN
154000mN
153950mN

200m FROM GAS BARRIER
150m FROM GAS BARRIER
100m FROM GAS BARRIER
50m FROM GAS BARRIER
GAS BARRIER
300m FROM GAS BARRIER
250m FROM GAS BARRIER
200m FROM GAS BARRIER
150m FROM GAS BARRIER
100m FROM GAS BARRIER
50m FROM GAS BARRIER

G1
43.064m AOD
G2
41.833m AOD
G3
40.106m AOD
G4
38.467m AOD
G5
39.381m AOD

GAS WELL

GAS BARRIER RADIAL MARKER

Rev	Date	Description	By
A	21.01.2020	D1 & BHA symbols corrected	MJW

Morgan Thacker

Title:-
INSTALLED GAS BARRIER
RELATIVE TO EXISTING GROUND

Project:-
P.J.BURKE
FARLEIGH HILL
TOVIL

Design by:-	Date	Scale:-	Sheet number:-
MJW	7th July 2020	1:625 @ A0	1 of 1

Drawing number:- MTL-127-21 Revision:- /

Waste Disposal Site

Hopper

Burial Ground

Track

Track

BM 44.99m

42.7m

29.3m

Posts

25.0m

Playground

BM 35.84m

44.8m

4.5m

154300mN

154250mN

154200mN

154150mN

154100mN

154050mN

154000mN

153950mN

678000mE

678100mE

678200mE

678300mE

678400mE

678500mE

678600mE

678700mE

678800mE

250m FROM GAS BARRIER

150m FROM GAS BARRIER

100m FROM GAS BARRIER

50m FROM GAS BARRIER

300m FROM GAS BARRIER

250m FROM GAS BARRIER

200m FROM GAS BARRIER

150m FROM GAS BARRIER

100m FROM GAS BARRIER

50m FROM GAS BARRIER

GAS BARRIER

G1
43.064m AOD

G2
41.833m AOD

G3
40.106m AOD

G4
38.467m AOD

G5
39.381m AOD

El Sub Sta

WB

El Sub Sta

Tank

CDM REGULATIONS 2015 RESIDUAL HAZARDS

RESIDUAL HAZARDS IDENTIFIED

CONSTRUCTION

1. THE SITE IS BELIEVED TO BE A FORMER HOUSEHOLD REFUSE TIP. CONTRACTORS AND OTHERS ENGAGED TO WORK ON THE SITE SHOULD BE MADE AWARE OF THE POTENTIAL FOR CONTAMINATED GROUND CONDITIONS AND HAZARDOUS SUBSTANCES.
2. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

FUTURE DEMOLITION

A. THE SITE'S ORIGINAL USE AND ITS POTENTIAL FOR CONTAMINATED OR HAZARDOUS GROUND CONDITIONS SHOULD BE HIGHLIGHTED TO THE END USER.
B. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

THIS REGISTER IS A NON-EXHAUSTIVE LIST OF RESIDUAL HAZARDS RELATING TO THE WORKS SHOWN ON THIS DRAWING THAT HAVE BEEN IDENTIFIED DURING THE DESIGN STAGE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A CONTRACTOR WITH THE APPROPRIATE SKILLS, KNOWLEDGE & EXPERIENCE, AND IF THEY ARE AN ORGANISATION, THE ORGANISATIONAL CAPABILITY NECESSARY TO FULFIL THE ROLE.

Historic data provided by Knapp Hicks Consulting Civil, Structural and Geotechnical Engineers.

J.C.White drawing 17/00293-02 titled 'Orthographic Aerial Image & Level Survey', dated April 2019 has been used to define the existing ground level surface profile.

BHD Architects drawing 2989-PD001-Rev E titled 'Site Plan', dated October 2015 has been used to define the proposed ground surface profile.

Various surfaces were developed from the survey and design information extracted from the above drawings, these are defined below;

EG
Existing ground level defined by the J.C.White survey data

ASL
No surface strip has been allowed for.

Proposed Finish
Finished surface site profile as defined by the BDH Architects drawing with additional points introduced to define the road profiles and car parks & garden levels interpolated between plots and roads.

Proposed Formation
Formation level (underside) of the permanent works defined by the proposed finished surface level reduced by an assumed 750mm construction thickness.

EG to Formation
Comparison between EG (existing ground level) and Proposed Formation surfaces delivering total volume of cut and fill for the whole site re-grade operation based on assumed construction thickness.

Contours in red at 0.50m intervals represent areas of cut. Contours in blue at 0.50m intervals represent areas of fill. Major contours displayed in light grey at 1.00m intervals and minor contours displayed in dark grey at 0.20m intervals represent existing ground level.

A grid is presented at 25.00m intervals.

No allowance has been made for bulking or compaction.

This assessment has been produced based on preliminary and assumed data. A more detailed volumetric assessment from a comprehensive set of proposed levels and construction thickness will be required if greater confidence is required in the assessment conclusion.

GAS WELL

GAS BARRIER RADIAL MARKER

Rev	Date	Description	By
A	21.01.2020	D1 & BHA symbols corrected	MJW

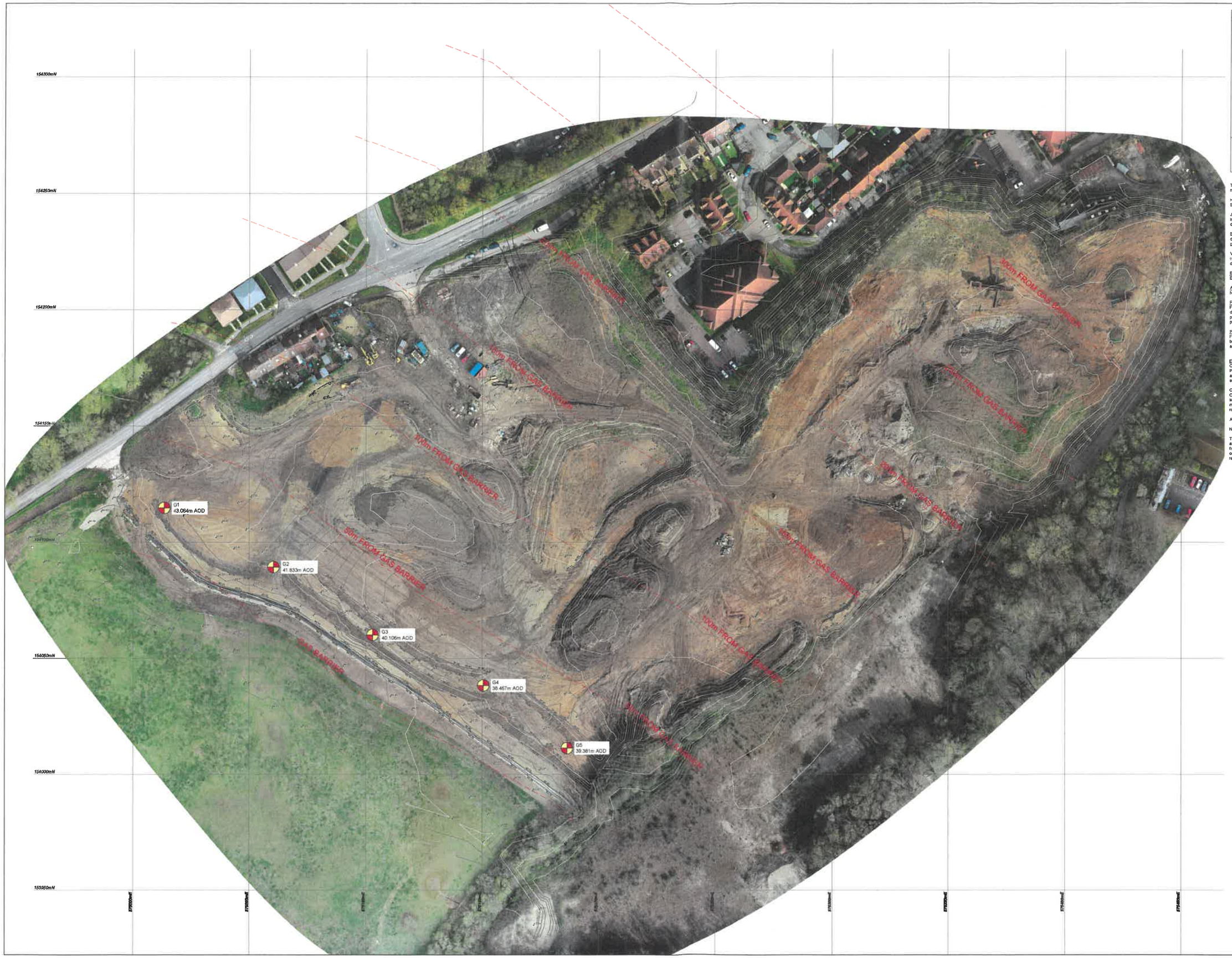
Morgan Thacker

Title:-
INSTALLED GAS BARRIER
RELATIVE TO PROPOSED DEVELOPMENT

Project:-
P.J.BURKE
FARLEIGH HILL
TOVIL

Drn by:- MJW	7th July 2020	Scale:- 1:500 @ A0	Sheet number:- 1 of 1

Drawing number:- MTL-127-20 Revision:- /



CDM REGULATIONS 2015 RESIDUAL HAZARDS

RESIDUAL HAZARDS IDENTIFIED

CONSTRUCTION

1. THE SITE IS BELIEVED TO BE A FORMER HOUSEHOLD REFUSE TIP. CONTRACTORS AND OTHERS ENGAGED TO WORK ON THE SITE SHOULD BE MADE AWARE OF THE POTENTIAL FOR CONTAMINATED GROUND CONDITIONS AND HAZARDOUS SUBSTANCES.
2. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

FUTURE DEMOLITION

A. THE SITE'S ORIGINAL USE AND ITS POTENTIAL FOR CONTAMINATED OR HAZARDOUS GROUND CONDITIONS SHOULD BE HIGHLIGHED TO THE END USER.
B. NO SIGNIFICANT OTHER HAZARDS BEYOND THOSE KNOWN TO AN EXPERIENCED CONTRACTOR.

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Historic data provided by Knapp Hicks Consulting Civil, Structural and Geotechnical Engineers.

J.C.White drawing 17/00/033-02 titled 'Orthographic Aerial Image & Level Survey', dated April 2019 has been used to define the existing ground level surface profile.

BHD Architects drawing 2989-PD001-Rev E titled 'Site Plan', dated October 2015 has been used to define the proposed ground surface profile.

Various surfaces were developed from the survey and design information extracted from the above drawings, these are defined below;

EG
Existing ground level defined by the J.C.White survey data.

ASL
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Proposed Finish
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Comparison between EG (existing ground level) and Proposed Formation surfaces delivering total volume of cut and fill for the whole site re-grade operation based on assumed construction thickness.

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A grid is presented at 25.00m intervals.

No allowance has been made for bulking or compaction.

This assessment has been produced based on preliminary and assumed data. A more detailed volumetric assessment from a comprehensive set of proposed levels and construction thickness will be required if greater confidence is required in the assessment conclusion.

GAS WELL

GAS BARRIER RADIAL MARKER

Rev	Date	Description	By
A	21.01.2020	D1 & BH symbols corrected	MJW

Morgan Thacker Ltd

Title:
INSTALLED GAS BARRIER
RELATIVE TO EXISTING GROUND
PLUS RASTER IMAGE

Project:
P J BURKE
FARLEIGH HILL
TOVIL

Drn by: MJW	7th July 2020	Scale: 1:500 @ A0	Sheet number: 1 of 1

Drawing number: MTL-127-22 Revision: /

Appendices

A	Tovil Quarry Ground Gas Monitoring Wells – Boreholes Logs

Rotary Core Log

Borehole No. G1
Sheet 1 of 1

Project Name: Tovil	Project No. 27686	Co-ords: -	Hole Type RC
Location: Maidstone		Level:	Scale 1:50
Client: P J Burke		Dates: 14/11/2019 - 14/11/2019	Logged By

Well	Water Strikes	Depth (m)	Type / Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
										Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE and LIMESTONE.
							3.50			Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE LIMESTONE and brick.
							5.00			Made Ground recovered as- fine to boulder sized gravel of brick, SANDSTONE and LIIMESTONE.
							6.00			End of borehole at 6.00 m

Remarks
1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 6.00 mbgl. 3. No Roots or groundwater were encountered. 4. Boreholes were open-hole rotary drilled with air mist flush.

Rotary Core Log

Borehole No. G2

Sheet 1 of 1

Project Name: Tovil	Project No. 27686	Co-ords: -	Hole Type RC
Location: Maidstone		Level:	Scale 1:50
Client: P J Burke		Dates: 15/11/2019 - 15/11/2019	Logged By CD

Well	Water Strikes	Depth (m)	Type / Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
										Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE and LIMESTONE.
							6.00			End of borehole at 6.00 m

Remarks

1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 6.00 mbgl. 3. No Roots or groundwater were encountered. 4. Boreholes were open-hole rotary drilled with air mist flush.

Rotary Core Log

Borehole No. G3
Sheet 1 of 1

Project Name: Tovil	Project No. 27686	Co-ords: -	Hole Type RC
Location: Maidstone		Level:	Scale 1:50
Client: P J Burke		Dates: 15/11/2019 - 15/11/2019	Logged By

Well	Water Strikes	Depth (m)	Type / Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
										Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE and LIMESTONE.
							6.30			Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE LIMESTONE and brick.
							6.50			End of borehole at 6.50 m

Remarks
1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 6.50 mbgl. 3. No Roots or groundwater were encountered.

Rotary Core Log

Borehole No. G4

Sheet 1 of 2

Project Name: Tovil	Project No. 27686	Co-ords: -	Hole Type RC
Location: Maidstone		Level:	Scale 1:50
Client: P J Burke		Dates: 15/11/2019 - 15/11/2019	Logged By CD

Well	Water Strikes	Depth (m)	Type / FI	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
										Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE and LIMESTONE.
							8.00			Made Ground recovered as Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE LIMESTONE and brick.
										Continued on next sheet

1 2 3 4 5 6 7 8 9 10

Remarks

1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 14.00 mbgl. 3. No Roots or groundwater were encountered. 4. Boreholes were open-hole rotary drilled with air mist flush.

AGS

Rotary Core Log

Project Name: Tovil	Project No. 27686	Co-ords: -	Borehole No. G4 Sheet 2 of 2
Location: Maidstone		Level:	Hole Type RC
Client: P J Burke		Dates: 15/11/2019 - 15/11/2019	Scale 1:50
			Logged By CO

Well	Water Strikes	Depth (m)	Type / Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
							13.00			Grey slightly silty CLAY.
							14.00			End of borehole at 14.00 m

11 12 13 14 15 16 17 18 19 20

Remarks

1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 14.00 mbgl. 3. No Roots or groundwater were encountered. 4. Boreholes were open-hole rotary drilled with air mist flush.

Rotary Core Log

Borehole No. G5
Sheet 1 of 1

Project Name: Tovil	Project No. 27686	Co-ords: -	Hole Type RC
Location: Maidstone		Level:	Scale 1:50
Client: P J Burke		Dates: 20/11/2019 - 20/11/2019	Logged By

Well	Water Strikes	Depth (m)	Type / Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
										Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE and LIMESTONE.
							4.00			Made Ground recovered as- Yellowish brown sandy CLAY with fine to boulder sized, gravel of SANDSTONE LIMESTONE and brick.
							6.00			End of borehole at 6.00 m

1 2 3 4 5 6 7 8 9 10

Remarks
1. Location was CAT scanned prior to works commencing. 2. A monitoring well was installed to 6.00 mbgl. 3. No Roots or groundwater were encountered. 4. Boreholes were open-hole rotary drilled with air mist flush.

AGS

Appendices

B	Tovil Quarry Ground Gas Monitoring Results Calculated Ground Gas Screening Values Calculated Characteristic Situation Ratings

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Job No: 27686
Client: PJ Burke
Visit No: Initial
Site: Tovil Quarry
Operator: CD
Date: 25/11/2019

Monitoring Point	Gas Concentrations										Flow Data				Well & Water Data			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady						
G1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Dry	6.82	Fill	1m upstand measured to top
G2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Dry	6.83	Fill	1m upstand measured to top
G3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Dry	7.00	Fill	1m upstand measured to top
G4	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Dry	14.10	Fill	1m upstand measured to top
G5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Damp at Base	6.83	Fill	1m upstand measured to top

Meteorological and Site Information:

State of ground:		Dry		Moist	x	Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong		
Cloud Cover:		None		Slight		Cloudy		Overcast	x	
Precipitation:		None		Slight		Moderate	x	Heavy		

NM- Not monitored

Barometric Pressure (mbar): 997

Date: 03/12/2019

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.00	0.00	1.20	0.40	2.60	2.60	0.03	0.02	16.10	16.00	5.80	5.70	51	20	1.8	Dry	6.82	Fill	1m upstand measured to top	0.1508	0	CS2	CS1
G2	0.00	0.00	0.00	0.00	4.30	4.30	0.02	0.02	8.80	8.00	5.80	5.70	51	15	1.0	Dry	6.83	Fill	1m upstand measured to top	0.2494	0	CS2	CS1
G3	1.20	1.20	27.00	27.00	2.30	2.30	0.06	0.04	0.30	0.30	5.80	5.70	51	30	1.5	Dry	7.00	Fill	1m upstand measured to top	0.1334	0.0696	CS2	CS1
G4	0.00	0.00	0.00	0.00	3.60	3.60	0.02	0.01	8.50	8.00	5.80	5.70	51	20	1.0	Dry	14.10	Fill	1m upstand measured to top	0.2088	0	CS2	CS1
G5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	19.70	18.00	5.80	5.70	51	30	1.0	Damp at Base	6.83	Fill	1m upstand measured to top	0	0	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Meteorological and Site Information:

State of ground:		Dry	x	Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong	
Cloud Cover:		None	x	Slight		Cloudy		Overcast	
Precipitation:	x	None		Slight		Moderate		Heavy	

NM- Not monitored

Barometric Pressure (mbar): 1021

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 12/12/2019

Job No: 27686
Visit No: 2 of 3
Operator: CD

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.00	0.00	0.00	0.00	2.60	2.60	0.02	0.02	16.80	16.00	5.80	5.70	52	20	1.0	Dry	6.82	Fill	1m upstand measured to top	0.1508	0	CS2	CS1
G2	1.20	1.20	28.60	25.00	4.30	4.30	0.06	0.04	6.50	6.50	5.10	5.00	51	20	1.0	Dry	6.83	Fill	1m upstand measured to top	0.2193	0.0612	CS2	CS1
G3	1.60	1.40	42.60	30.00	2.30	2.30	0.09	0.08	0.20	0.20	5.20	5.00	44	20	1.9	Dry	7.00	Fill	1m upstand measured to top	0.1196	0.0832	CS2	CS2
G4	1.30	1.00	13.20	10.00	3.60	3.60	0.05	0.04	0.50	0.50	5.80	5.70	53	20	1.3	Dry	14.10	Fill	1m upstand measured to top	0.2088	0.0754	CS2	CS2
G5	1.20	1.00	27.90	20.00	0.00	0.00	0.07	0.06	2.50	2.50	5.70	5.70	51	35	1.0	Damp at Base	6.83	Fill	1m upstand measured to top	0	0.0684	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Meteorological and Site Information:

State of ground:		Dry		Moist	x	Wet		Snow		Frozen
Wind:		Calm		Light	x	Moderate		Strong		
Cloud Cover:		None		Slight		Cloudy		Overcast	x	
Precipitation:		None		Slight		Moderate	x	Heavy		

NM- Not monitored

Barometric Pressure (mbar): 986

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 10/01/2020

Job No: 27686
Visit No: 3 of 3
Operator: CD

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.00	0.00	0.00	0.00	2.50	2.40	0.03	0.02	16.80	16.00	5.80	5.70	72	20	1.0	Dry	6.82	Fill	1m upstand measured to top	0.145	0	CS2	CS1
G2	1.20	1.20	22.00	20.00	4.30	4.30	0.05	0.04	6.50	6.50	5.00	4.80	60	20	1.0	Dry	6.83	Fill	1m upstand measured to top	0.215	0.06	CS2	CS1
G3	3.30	3.20	84.60	83.00	2.40	2.30	0.16	0.12	0.80	0.60	6.20	6.00	72	20	3.6	Dry	7.00	Fill	1m upstand measured to top	0.1488	0.2046	CS2	CS2
G4	1.30	1.00	13.20	10.00	3.60	3.60	0.05	0.04	20.00	17.00	5.60	5.40	55	20	1.3	Dry	14.10	Fill	1m upstand measured to top	0.2016	0.0728	CS2	CS2
G5	1.20	1.00	25.00	21.00	0.00	0.00	0.06	0.05	17.40	16.00	5.60	5.50	53	35	1.0	Damp at Base	6.83	Fill	1m upstand measured to top	0	0.0672	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Meteorological and Site Information:

State of ground:	x	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong	
Cloud Cover:		None		Slight		Cloudy	x	Overcast	
Precipitation:	x	None		Slight		Moderate		Heavy	

NM- Not monitored

Barometric Pressure (mbar): 1020

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry **Job No:** 27686

Client: PJ Burke **Visit No:** 4

Site: Tovil Quarry **Operator:** CD

Date: 11/02/2020

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.00	0.00	0.00	0.00	2.40	2.30	0.04	0.03	16.50	16.10	1.0	0.0	0.0	20.0	1.0	Dry	6.82	Fill	1m upstand measured to top	0.024	0	CS1	CS1
G2	1.20	1.20	26.00	22.00	4.20	4.00	0.06	0.05	6.80	6.50	1.0	1.0	0.0	20.0	1.0	Dry	6.83	Fill	1m upstand measured to top	0.042	0.012	CS1	CS1
G3	3.40	3.20	82.00	78.00	2.30	2.00	0.14	0.13	1.20	1.00	4.1	3.8	1.0	20.0	3.6	Dry	7.00	Fill	1m upstand measured to top	0.0943	0.1394	CS2	CS2
G4	1.25	1.00	14.00	12.00	3.20	3.00	0.06	0.05	18.50	16.00	1.0	1.0	0.0	20.0	1.3	Dry	14.10	Fill	1m upstand measured to top	0.032	0.0125	CS1	CS1
G5	1.25	1.00	23.00	20.00	0.00	0.00	0.06	0.05	17.60	15.00	1.0	1.0	0.0	20.0	1.0	Damp at Base	6.83	Fill	1m upstand measured to top	0	0.0125	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Meteorological and Site Information:

State of ground:		Dry	x	Moist		Wet		Snow		Frozen
Wind:		Calm		Light		Moderate		Strong	x	
Cloud Cover:		None	x	Slight		Cloudy		Overcast		
Precipitation:	x	None		Slight		Moderate		Heavy		

NM- Not monitored

Barometric Pressure (mbar): 1003

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 21/04/2020

Job No: 27686
Visit No: 5
Operato KB

Monitoring Point	Gas Concentrations: Methane (%v/v) Peak	Methane (%v/v) Steady	% LEL Peak	% LEL Steady	Carbon Dioxide Peak	Carbon Dioxide Steady	Hydrogen Peak	Hydrogen Steady	Oxygen (%v/v) Peak	Oxygen (%v/v) Steady	Flow Data: Flow rate (l/hr) Peak	Flow rate (l/hr) Steady	Differential borehol	Time for flow to	PID PID %	Well & Water Data: Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	Situation Classification (BS8485:2015+A1:2019): GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
G1	0.10	0.10	2.70	2.50	0.00	0.00	0.00	0.00	20.40	20.30	0.0	0.0	0.0	60.0	1.0	Dry	6.82	Fill	1m upstand	0	0	CS1	CS1
G2	0.10	0.10	3.10	2.90	0.00	0.00	0.00	0.00	20.40	20.40	0.0	0.0	0.0	60.0	1.0	Dry	6.83	Fill	1m upstand	0	0	CS1	CS1
G3	0.80	0.70	19.00	18.70	2.80	2.70	0.00	0.00	4.10	4.00	0.4	0.1	0.0	90.0	1.3	7.77	7.00	Fill	1m upstand	0.0112	0.0032	CS1	CS1
G4	0.20	0.10	4.80	4.60	2.00	1.90	0.00	0.00	19.70	19.60	0.1	0.0	0.0	90.0	1.0	Dry	14.10	Fill	1m upstand	0.002	0.0002	CS1	CS1
G5	0.30	0.30	8.20	8.00	1.80	1.80	0.00	0.00	16.60	16.60	0.0	0.0	0.0	90.0	1.1	5.91	6.83	Fill	1m upstand	0	0	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitoring	WELL & WATER DATA: Water Level		Base of Well
BH-A	21.94		31.00
BH-B1	18.80		24.00
BH-TV S3	20.85		25.05
BH-TV S8	>30.25		39.40

Meteorological and Site Information:

State of ground:		Dry	x	Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong	
Cloud Cover:		None	x	Slight		Cloudy		Overcast	
Precipitation:		None	x	Slight		Moderate		Heavy	

NM- Not monitored

Barometric Pressure (mbar): 1011

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 22/05/2020

Job No: 27686
Visit No: 6
Operator: PB

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (mb)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.10	0.10			0.00	0.00	0.00	0.00	20.40	20.30	0.0	0.0	0.0	60.0	1.0	Dry	6.82	Fill	1m upstand	0	0	CS1	CS1
G2	0.10	0.10			0.00	0.00	0.00	0.00	20.40	20.40	0.0	0.0	0.0	60.0	1.0	Dry	6.83	Fill	1m upstand	0	0	CS1	CS1
G3	0.80	0.70			2.80	2.70	0.00	0.00	4.10	4.00	0.4	0.1	0.0	90.0	1.3	7.77	7.00	Fill	1m upstand	0.0112	0.0032	CS1	CS1
G4	0.20	0.10			2.00	1.90	0.00	0.00	19.70	19.60	0.1	0.0	0.0	90.0	1.0	Dry	14.10	Fill	1m upstand measured	0.002	0.0002	CS1	CS1
G5	0.30	0.30			1.80	1.80	0.00	0.00	16.60	16.60	0.0	0.0	0.0	90.0	1.1	5.91	6.83	Fill	1m upstand measured	0	0	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitoring Point	WELL & WATER DATA		
	Water Level (m - top of pipe)		Base of Well (m)
BH-A	21.94		31.00
BH-B1	18.80		24.00
BH-TV S3	20.85		25.05
BH-TV S8	>30.25		39.40

Meteorological and Site Information:

State of ground:		Dry	x	Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong	
Cloud Cover:		None	x	Slight		Cloudy		Overcast	
Precipitation:		None	x	Slight		Moderate		Heavy	

NM- Not monitored

Barometric Pressure (mbar): 1011

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 05/06/2020

Job No: 27686
Visit No: 7
Operator: LI

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.10	0.10	4.90	4.70	1.30	1.20	0.00	0.00	16.90	16.70	7.8	7.8	7.8	45.0	1.0	6.9	6.96	Fill		0.1014	0.0078	CS2	CS1
G2	0.20	0.20	6.00	6.00	6.20	6.20	0.00	0.00	9.30	9.30	8.0	8.0	8.0	45.0	1.0	DRY	6.98	Fill		0.496	0.016	CS2	CS1
G3	0.10	0.10	3.80	3.80	2.50	2.50	0.00	0.00	0.40	0.40	7.9	7.9	7.8	45.0	1.0	DRY	7.70	Fill		0.1975	0.0079	CS2	CS1
G4	0.10	0.10	4.00	4.00	3.80	3.80	0.00	0.00	14.40	14.40	7.8	7.8	7.9	45.0	1.0	DRY	14.60	Fill	1m upstand measured to top	0.2964	0.0078	CS2	CS1
G5	3.30	3.30	75.90	75.90	8.70	8.70	0.00	0.00	2.40	2.40	8.0	8.0	7.9	45.0	3.5	5.27	6.83	Fill		0.696	0.264	CS2	CS2

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitoring Point	WELL & WATER DATA			
	Water Level (m - top of pipe)		Base of Well (m)	
BH-A	20.15		31.00	0.30
BH-B1	19.00		24.00	0.25
BH-TV S3	21.53		25.05	0.48
BH-TV S8	35.30		39.40	0.60

7.92

Meteorological and Site Information:

State of ground:		Dry	x	Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong	
Cloud Cover:		None		Slight	x	Cloudy		Overcast	
Precipitation:		None	x	Slight		Moderate		Heavy	

NM- Not monitored

Barometric Pressure (mbar): 991-993

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 09/07/2020

Job No: 27686
Visit No: 8
Operator: LI

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.20	0.10	4.60	4.40	1.40	1.10	0.00	0.00	18.90	18.90	0.4	0.3	0.3	45.0	1.0	DRY	6.93	Fill		0.0056	0.0008	CS1	CS1
G2	0.30	0.10	4.90	4.40	4.90	4.80	0.00	0.00	10.80	10.80	0.3	0.3	1.0	45.0	1.0	DRY	6.98	Fill		0.0147	0.0009	CS1	CS1
G3	0.60	0.20	5.70	5.50	2.90	2.70	0.00	0.00	10.30	9.70	0.3	0.3	1.0	45.0	1.0	DRY	7.82	Fill		0.0087	0.0018	CS1	CS1
G4	0.30	0.20	5.20	4.60	8.30	3.70	0.00	0.00	12.70	12.20	0.2	0.2	0.1	45.0	1.0	DRY	14.05	Fill	1m upstand measured to top	0.0166	0.0006	CS1	CS1
G5	0.30	0.20	5.90	5.50	8.80	8.60	0.00	0.00	7.30	7.10	0.4	0.3	0.3	45.0	1.0	5.15	7.03	Fill		0.0352	0.0012	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitoring Point	WELL & WATER DATA		
	Water Level (m - top of pipe)		Base of Well (m)
BH-A	20.31		31.00
BH-B1	19.15		24.00
BH-TV S3	22.10		25.05
BH-TV S8	31.70		39.40

0.30
0.25
0.48
0.60

Meteorological and Site Information:

State of ground:		Dry		Moist	x	Wet		Snow		Frozen
Wind:		Calm		Light		Moderate	x	Strong		
Cloud Cover:		None		Slight		Cloudy	x	Overcast		
Precipitation:		None	x	Slight		Moderate		Heavy		

NM- Not monitored

Barometric Pressure (mbar): 1006

Ground Gas and Groundwater Monitoring Record Sheet

Job Details: Tovil Quarry **Job No:** 27686

Client: PJ Burke **Visit No:** 9

Site: Tovil Quarry **Operator:** LI

Date: 02/10/2020

Monitoring Point	Gas Concentrations										Flow Data				PID	Well & Water Data				Situation Classification (BS8485:2015+A1:2019)			
	Methane (%v/v)		% LEL		Carbon Dioxide (% v/v)		Hydrogen Sulphide (ppmv)		Oxygen (%v/v)		Flow rate (l/hr)		Differential borehole pressure (Pa)	Time for flow to equalise (secs)	PID %	Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady											
G1	0.40	0.30			0.40	0.10	0.00	0.00	20.90	20.70	0.4	0.4	0.1	45.0		DRY	6.92	Fill		0.0016	0.0016	CS1	CS1
G2	0.30	0.20			4.30	4.00	0.00	0.00	20.80	20.70	0.1	0.1	0.1	45.0		DRY	7.03	Fill		0.0043	0.0003	CS1	CS1
G3	0.40	0.30			1.00	0.80	0.00	0.00	20.80	20.80	0.1	0.1	1.0	45.0		DRY	7.80	Fill		0.001	0.0004	CS1	CS1
G4	0.30	0.20			6.30	3.00	0.00	0.00	20.80	20.60	0.1	0.1	1.0	45.0		DRY	14.50	Fill	1m upstand measured to top	0.0063	0.0003	CS1	CS1
G5	0.20	0.20			2.10	1.60	0.00	0.00	20.30	20.30	0.2	0.2	2.0	45.0		3.43	7.00	Fill		0.0042	0.0004	CS1	CS1

Not reading

Not reading

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitoring Point	WELL & WATER DATA			
	Water Level (m - top of pipe)		Base of Well (m)	
BH-A	20.42		31.07	0.30
BH-B1				0.25
BH-TV S3	22.90		25.09	0.48
BH-TV S8	35.30		37.95	0.60

BH B1 not found

Meteorological and Site Information:

State of ground:		Dry		Moist		Wet	x	Snow		Frozen
Wind:		Calm		Light		Moderate	x	Strong		
Cloud Cover:		None		Slight		Cloudy		Overcast	x	
Precipitation:		None		Slight		Moderate		Heavy	x	

NM- Not monitored

Barometric Pressure (mbar): 983

Ground Gas and Groundwater Monitoring Record Sheet

Job Data Tovil Quarry
Client: PJ Burke
Site: Tovil Quarry
Date: 27/10/2020

Job No: 27686
Visit No: 10
Operator: LI

Monitoring Point	Gas Concentrations: Methane (%v/v) Peak	Methane (%v/v) Steady	% LEL Peak	% LEL Steady	Carbon Dioxide (% v/v) Peak	Carbon Dioxide (% v/v) Steady	Hydrogen Sulphide (ppmv) Peak	Hydrogen Sulphide (ppmv) Steady	Oxygen (%v/v) Peak	Oxygen (%v/v) Steady	Flow Data: Flow rate (l/hr) Peak	Flow rate (l/hr) Steady	Differential borehole pressur	Time for flow to equalise (secs)	PID: PID %	Well & Water Data: Water Level (mbgl)	Depth of well (m)	Response Zone	Comments	Situation Classification: GSV (CO_2)	GSV (CH_4)	Characteristic Situation CO_2	Characteristic Situation CH_4
G1	0.00	0.00	0.00	0.00	2.40	2.00	0.00	0.00	18.90	17.00	0.2	0.2	1.0	45.0	0.020	DRY	6.96	Fill		0.0048	0	CS1	CS1
G2	0.00	0.00	0.00	0.00	2.60	2.30	0.00	0.00	19.80	16.50	0.2	0.2	1.0	45.0	0.021	6.81	6.98	Fill		0.0052	0	CS1	CS1
G3	0.00	0.00	0.00	0.00	3.00	2.50	0.00	0.00	17.10	15.70	0.1	0.1	1.0	45.0	0.021	5.96	7.83	Fill		0.003	0	CS1	CS1
G4	0.40	0.00	0.00	0.00	3.10	2.80	0.00	0.00	16.80	15.70	0.2	0.2	1.0	45.0	0.022	DRY	14.70	Fill	1m upstand	0.0062	0.0008	CS1	CS1
G5	0.00	0.00	0.00	0.00	0.70	0.50	0.00	0.00	20.30	20.10	0.2	0.2	1.0	45.0	0.022 (Hexane)	3.37	7.01	Fill		0.0014	0	CS1	CS1

Characteristic Situation	Upper Limit
1	0.07
2	0.7
3	3.5
4	15
5	70
6	>70

Monitor	WELL & WATER DATA: Water Level		Base of Well (m)	
BH-A	20.56		31.09	0.30
BH-B1				0.25
BH-TV S	22.20		31.15	0.48
BH-TV S	25.70		38.05	0.60

BH B1 not found

Meteorological and Site Information:

State of ground:	Dry		Moist		Wet	x	Snow		Frozen
Wind:	Calm		Light		Moderate		Strong	x	
Cloud Cover:	None		Slight		Cloudy		Overcast	x	
Precipitation:	None		Slight		Moderate		Heavy	x	

NM- Not monitored

Barometric Pressure 987

Appendices

C	KCC Monitoring Results at Tovil Landfill

Sample Point	Date	Source	Location	Balance (%)	Barometric Pressure (MB)	Carbon Dioxide (%)	Carbon Monoxide (PPM)	Hydrogen Sulfide (PPM)	Methane (%)	Oxygen (%)
TV-3 at 2m	2020-01-20T09:39:15	Gas Analys	Tovil Greer	76.9	1048	0.2	0	0	0.1	22.8
TV-3 at 2m	2020-02-10T09:44:42	Gas Analys	Tovil Greer	77.8	1001	0.3	0	0	0.1	21.8
TV-3 at 2m	2020-03-02T11:39:16	Gas Analys	Tovil Greer	79.3	989	0.2	0	0	0.1	20.4
TV-3 at 2m	2020-04-20T09:17:03	Gas Analys	Tovil Greer	78.3	1017	0.2	0	0	0	21.5
TV-3 at 2m	2020-06-01T08:27:38	Gas Analys	Tovil Greer	78.3	1020	0.7	0	0	0.1	20.9
TV-3 at 2m	2020-07-13T09:36:30	Gas Analys	Tovil Greer	79.1	1023	0.8	1	1	0	20.1
TV-3 at 2m	2020-08-03T13:06:35	Gas Analys	Tovil Greer	79	1013	0.7	0	0	0	20.3
TV-3 at 2m	2020-09-16T09:14:16	Gas Analys	Tovil Greer	78.7	1019	0.6	0	2	0.1	20.6
TV-4 at 2m	2020-09-16T09:41:08	Gas Analys	Tovil Greer	78.8	1019	0.5	0	2	0	20.7
TV-4 at 2m	2020-07-13T10:00:37	Gas Analys	Tovil Greer	78.6	1022	1	0	1	0	20.4
TV-4 at 2m	2020-08-03T10:55:38	Gas Analys	Tovil Greer	78.9	1013	1.2	0	0	0.4	19.5
TV-4 at 2m	2020-06-01T08:33:19	Gas Analys	Tovil Greer	78.5	1020	0.7	0	0	0.1	20.7
TV-4 at 2m	2020-04-20T09:39:47	Gas Analys	Tovil Greer	78	1016	0.1	1	1	0	21.9
TV-4 at 2m	2020-02-10T10:07:52	Gas Analys	Tovil Greer	78.5	1001	1.3	0	0	0.1	20.1
TV-4 at 2m	2020-01-20T10:01:00	Gas Analys	Tovil Greer	76.9	1048	0.2	0	0	0.1	22.8
TV-4 at 2m	2020-03-02T12:01:22	Gas Analys	Tovil Greer	78.8	988	0.8	0	0	0	20.4
TV-4 at 4m	2020-03-02T12:02:15	Gas Analys	Tovil Greer	81.9	989	9.9	0	0	0	8.2
TV-4 at 4m	2020-01-20T10:03:14	Gas Analys	Tovil Greer	78.7	1048	8.5	0	0	0.1	12.7
TV-4 at 4m	2020-02-10T10:08:45	Gas Analys	Tovil Greer	82	1001	9.9	0	0	0	8.1
TV-4 at 4m	2020-04-20T09:40:33	Gas Analys	Tovil Greer	78.7	1016	7.3	0	0	0	14
TV-4 at 4m	2020-06-01T08:34:05	Gas Analys	Tovil Greer	79.2	1020	6.3	0	0	0	14.5
TV-4 at 4m	2020-08-03T10:56:27	Gas Analys	Tovil Greer	79	1013	8.3	0	0	0.3	12.4
TV-4 at 4m	2020-07-13T10:01:20	Gas Analys	Tovil Greer	79.5	1023	7.4	1	1	0	13.1
TV-4 at 4m	2020-09-16T09:42:01	Gas Analys	Tovil Greer	78.9	1019	8.5	1	2	0	12.6
TV-4 at 8m	2020-09-16T09:42:48	Gas Analys	Tovil Greer	78.5	1020	1.8	0	2	0	19.7
TV-4 at 8m	2020-07-13T10:02:04	Gas Analys	Tovil Greer	78.2	1023	2.4	0	1	0	19.4
TV-4 at 8m	2020-08-03T10:57:13	Gas Analys	Tovil Greer	78.5	1013	3.2	0	0	0.3	18
TV-4 at 8m	2020-06-01T08:34:53	Gas Analys	Tovil Greer	78.5	1020	1.5	0	0	0	20
TV-4 at 8m	2020-04-20T09:41:17	Gas Analys	Tovil Greer	77.8	1016	0.2	0	1	0	22
TV-4 at 8m	2020-02-10T10:09:37	Gas Analys	Tovil Greer	81.1	1000	7.9	0	0	0.1	10.9
TV-4 at 8m	2020-01-20T10:04:02	Gas Analys	Tovil Greer	76.3	1047	2.6	0	0	0.1	21
TV-4 at 8m	2020-03-02T12:03:04	Gas Analys	Tovil Greer	78.8	988	1.6	0	0	0	19.6
TV-Flare_1	2020-03-02T12:13:42	Gas Analys	Tovil Greer	67.8	989	7.2	0	0	10.9	14.1
TV-Flare_1	2020-03-11T08:22:59	Gas Analys	Tovil Greer	43.4	1011	20.5	0	1	34.9	1.2
TV-Flare_1	2020-03-19T10:55:44	Gas Analys	Tovil Greer	68.5	1026	5.9	0	0	9.5	16.1
TV-Flare_1	2020-03-23T09:55:21	Gas Analys	Tovil Greer	70.4	1027	4.3	0	0	8.1	17.2
TV-Flare_1	2020-03-30T07:52:02	Gas Analys	Tovil Greer	58.9	1034	12.7	0	0	20.4	8
TV-Flare_1	2020-04-06T08:16:13	Gas Analys	Tovil Greer	55.9	1013	12.7	0	0	22	9.4
TV-Flare_1	2020-04-15T07:29:12	Gas Analys	Tovil Greer	66.5	1024	7.8	0	0	12.6	13.1
TV-Flare_1	2020-01-31T10:37:59	Gas Analys	Tovil Greer	45.7	1008	21.7	1	0	32.3	0.3
TV-Flare_1	2020-01-20T08:34:48	Gas Analys	Tovil Greer	58.6	1048	15	0	1	20.4	6
TV-Flare_1	2020-01-06T09:39:03	Gas Analys	Tovil Greer	40	1022	21.6	1	0	37	1.4
TV-Flare_1	2020-01-13T08:36:08	Gas Analys	Tovil Greer	53.4	1015	17.4	0	1	25.3	3.9
TV-Flare_1	2020-02-24T08:29:39	Gas Analys	Tovil Greer	40.1	1011	18.5	1	1	38.5	2.9
TV-Flare_1	2020-02-03T10:46:11	Gas Analys	Tovil Greer	67.7	1015	7.9	0	2	11.7	12.7
TV-Flare_1	2020-02-10T08:27:43	Gas Analys	Tovil Greer	43.4	1000	17.9	0	0	34.7	4
TV-Flare_1	2020-04-27T07:25:21	Gas Analys	Tovil Greer	50	1006	18.8	1	0	27.5	3.7
TV-Flare_1	2020-05-04T07:56:25	Gas Analys	Tovil Greer	63.1	1016	7.7	0	0	13.9	15.3
TV-Flare_1	2020-04-20T07:30:24	Gas Analys	Tovil Greer	55.4	1017	17.8	0	1	23.1	3.7
TV-Flare_1	2020-05-11T07:28:58	Gas Analys	Tovil Greer	57.3	1014	12	0	0	20.5	10.2
TV-Flare_1	2020-05-20T13:14:21	Gas Analys	Tovil Greer	68.6	1020	4.5	0	0	8.8	18.1
TV-Flare_1	2020-05-28T08:19:03	Gas Analys	Tovil Greer	54.4	1033	10.7	0	0	20.8	14.1
TV-Flare_1	2020-06-01T07:30:49	Gas Analys	Tovil Greer	53.2	1020	17.8	0	0	24.2	4.8
TV-Flare_1	2020-06-12T07:31:40	Gas Analys	Tovil Greer	41.2	1003	20.7	0	0	35.4	2.7
TV-Flare_1	2020-06-15T08:26:14	Gas Analys	Tovil Greer	65.6	1014	10.7	0	0	13	10.7
TV-Flare_1	2020-06-22T08:28:00	Gas Analys	Tovil Greer	74.5	1023	2.4	0	0	3.6	19.5
TV-Flare_1	2020-07-13T08:48:27	Gas Analys	Tovil Greer	61	1023	10.5	0	0	16.2	12.3
TV-Flare_1	2020-06-29T08:22:48	Gas Analys	Tovil Greer	42.8	1008	21.8	0	0	34.5	0.9
TV-Flare_1	2020-07-09T08:35:32	Gas Analys	Tovil Greer	37.4	1010	23.1	1	0	39.1	0.4
TV-Flare_1	2020-08-03T10:45:45	Gas Analys	Tovil Greer	39.7	1013	22.8	0	0	36.9	0.6
TV-Flare_1	2020-07-20T08:30:38	Gas Analys	Tovil Greer	73.4	1020	3.3	0	0	4.7	18.6
TV-Flare_1	2020-07-27T08:57:58	Gas Analys	Tovil Greer	59.3	1007	10	0	0	17.1	13.6
TV-Flare_1	2020-08-11T09:03:15	Gas Analys	Tovil Greer	57.1	1012	11.7	1	0	19.1	12.1
TV-Flare_1	2020-08-18T08:29:52	Gas Analys	Tovil Greer	63.1	1007	7.8	0	0	14.2	14.9
TV-Flare_1	2020-09-01T08:30:50	Gas Analys	Tovil Greer	69.3	1019	5.4	0	0	8.8	16.5
TV-Flare_1	2020-09-01T08:31:18	Gas Analys	Tovil Greer	69.3	1019	5.4	0	0	8.8	16.5
TV-Flare_1	2020-09-07T08:39:23	Gas Analys	Tovil Greer	74	1021	2.8	0	0	4	19.2
TV-Flare_1	2020-09-21T08:48:40	Gas Analys	Tovil Greer	46.7	1015	17.2	0	1	27	9.1
TV-Flare_1	2020-09-16T08:14:42	Gas Analys	Tovil Greer	72.3	1018	3.5	0	0	5.5	18.7
TV-Flare_1	2020-09-28T08:30:28	Gas Analys	Tovil Greer	47.3	1010	20.9	0	0	28.8	3
TV-Flare_2	2020-09-28T08:33:13	Gas Analys	Tovil Greer	46.5	1010	21.6	0	0	29.6	2.3

Sample Point	Date	Source	Location	Balance (%)	Barometric Pressure (MB)	Carbon Dioxide (%)	Carbon Monoxide (PPM)	Hydrogen Sulfide (PPM)	Methane (%)	Oxygen (%)
TV-Flare_2	2020-09-16T08:17:38	Gas Analys	Tovil Greer	71.9	1019	3.6	1	0	5.9	18.6
TV-Flare_2	2020-09-21T08:51:32	Gas Analys	Tovil Greer	47.2	1015	17.4	0	1	26.7	8.7
TV-Flare_2	2020-09-07T08:41:34	Gas Analys	Tovil Greer	73.9	1021	2.8	0	0	4.1	19.2
TV-Flare_2	2020-09-01T08:35:08	Gas Analys	Tovil Greer	67.8	1018	6.4	0	0	10.1	15.7
TV-Flare_2	2020-08-18T08:31:47	Gas Analys	Tovil Greer	62.9	1007	8	0	0	14.4	14.7
TV-Flare_2	2020-08-11T09:05:05	Gas Analys	Tovil Greer	57.2	1012	11.7	0	0	19	12.1
TV-Flare_2	2020-07-27T09:03:00	Gas Analys	Tovil Greer	24.5	1006	23.5	0	3	51	1
TV-Flare_2	2020-07-20T08:34:21	Gas Analys	Tovil Greer	73.6	1020	3.3	0	0	4.6	18.5
TV-Flare_2	2020-08-03T10:46:34	Gas Analys	Tovil Greer	37.8	1013	23	0	0	38.8	0.4
TV-Flare_2	2020-07-09T08:38:21	Gas Analys	Tovil Greer	37.6	1010	23.1	0	0	39	0.3
TV-Flare_2	2020-06-29T08:24:38	Gas Analys	Tovil Greer	35.4	1007	19.9	0	0	40.5	4.2
TV-Flare_2	2020-07-13T08:51:02	Gas Analys	Tovil Greer	60.4	1023	10.9	0	0	16.7	12
TV-Flare_2	2020-06-22T08:30:46	Gas Analys	Tovil Greer	65.3	1023	7	0	0	11.6	16.1
TV-Flare_2	2020-06-15T08:29:54	Gas Analys	Tovil Greer	59.1	1014	13.6	0	0	19.1	8.2
TV-Flare_2	2020-06-12T07:34:42	Gas Analys	Tovil Greer	37	1003	18.9	0	0	38.7	5.4
TV-Flare_2	2020-06-01T07:34:02	Gas Analys	Tovil Greer	32.8	1020	20.7	0	3	43	3.5
TV-Flare_2	2020-05-28T08:20:59	Gas Analys	Tovil Greer	55.5	1033	11.4	0	0	20.5	12.6
TV-Flare_2	2020-05-20T13:17:11	Gas Analys	Tovil Greer	40.8	1019	20.9	0	0	37.5	0.8
TV-Flare_2	2020-05-11T07:31:31	Gas Analys	Tovil Greer	53.5	1014	13.6	0	0	24.2	8.7
TV-Flare_2	2020-04-20T07:31:54	Gas Analys	Tovil Greer	55.1	1017	18	0	1	23.3	3.6
TV-Flare_2	2020-05-04T07:58:09	Gas Analys	Tovil Greer	64.7	1016	7.2	0	0	12.6	15.5
TV-Flare_2	2020-04-27T07:29:33	Gas Analys	Tovil Greer	51.6	1006	17.7	0	0	25.7	5
TV-Flare_2	2020-02-10T08:30:31	Gas Analys	Tovil Greer	43.2	1000	18	0	0	34.9	3.9
TV-Flare_2	2020-02-03T10:49:36	Gas Analys	Tovil Greer	50.6	1015	19.4	1	4	27.3	2.7
TV-Flare_2	2020-02-24T08:30:43	Gas Analys	Tovil Greer	39.3	1011	18.8	1	0	39.3	2.6
TV-Flare_2	2020-01-13T08:39:12	Gas Analys	Tovil Greer	54	1014	17	1	0	24.4	4.6
TV-Flare_2	2020-01-06T09:45:28	Gas Analys	Tovil Greer	40.4	1022	21.6	1	0	36.5	1.5
TV-Flare_2	2020-01-20T08:36:18	Gas Analys	Tovil Greer	62.6	1048	10.3	0	1	15.1	12
TV-Flare_2	2020-01-31T10:41:10	Gas Analys	Tovil Greer	30.2	1008	22.9	0	1	46.2	0.7
TV-Flare_2	2020-04-15T07:32:08	Gas Analys	Tovil Greer	53.9	1024	17.7	1	3	24.6	3.8
TV-Flare_2	2020-04-06T08:19:03	Gas Analys	Tovil Greer	53.6	1013	15.5	1	0	24.3	6.6
TV-Flare_2	2020-03-30T07:54:50	Gas Analys	Tovil Greer	58.1	1034	13	1	0	20.9	8
TV-Flare_2	2020-03-23T09:58:30	Gas Analys	Tovil Greer	66.2	1027	7	0	0	11.4	15.4
TV-Flare_2	2020-03-19T10:56:55	Gas Analys	Tovil Greer	34.5	1025	23.1	1	5	41	1.4
TV-Flare_2	2020-03-11T08:25:59	Gas Analys	Tovil Greer	43	1011	20.7	1	1	35.3	1
TV-Flare_2	2020-03-02T12:16:41	Gas Analys	Tovil Greer	49.1	989	19.8	0	1	28.3	2.8
TV-Flare_3	2020-03-02T12:19:54	Gas Analys	Tovil Greer	63.8	989	13	0	1	16.1	7.1
TV-Flare_3	2020-03-11T08:28:22	Gas Analys	Tovil Greer	42.4	1011	21	1	1	35.7	0.9
TV-Flare_3	2020-03-19T10:57:54	Gas Analys	Tovil Greer	40.2	1025	21.4	0	2	36.5	1.9
TV-Flare_3	2020-03-23T10:01:51	Gas Analys	Tovil Greer	63	1027	10.9	0	0	15.4	10.7
TV-Flare_3	2020-03-30T09:13:27	Gas Analys	Tovil Greer	59.3	1033	12.4	0	0	19.2	9.1
TV-Flare_3	2020-04-06T08:22:09	Gas Analys	Tovil Greer	57.4	1013	13	0	0	20.7	8.9
TV-Flare_3	2020-04-15T07:33:31	Gas Analys	Tovil Greer	64.5	1024	12.9	0	2	15.2	7.4
TV-Flare_3	2020-01-31T10:44:34	Gas Analys	Tovil Greer	32.3	1008	22.5	1	0	44.7	0.5
TV-Flare_3	2020-01-20T08:37:19	Gas Analys	Tovil Greer	57.7	1048	15.5	0	1	21.5	5.3
TV-Flare_3	2020-01-06T09:48:36	Gas Analys	Tovil Greer	38	1022	20.5	0	0	38.4	3.1
TV-Flare_3	2020-01-13T08:42:44	Gas Analys	Tovil Greer	53	1014	17.7	0	0	25.8	3.5
TV-Flare_3	2020-02-24T08:33:04	Gas Analys	Tovil Greer	38.8	1011	19.1	1	0	39.6	2.5
TV-Flare_3	2020-02-03T10:53:23	Gas Analys	Tovil Greer	64.3	1015	13.2	1	3	16	6.5
TV-Flare_3	2020-02-10T08:35:08	Gas Analys	Tovil Greer	43.6	999	17.9	0	0	34.4	4.1
TV-Flare_3	2020-04-27T07:31:15	Gas Analys	Tovil Greer	46	1006	19	0	0	31	4
TV-Flare_3	2020-05-04T07:59:29	Gas Analys	Tovil Greer	63.9	1017	7.5	1	0	13.3	15.3
TV-Flare_3	2020-04-20T07:32:59	Gas Analys	Tovil Greer	55.1	1017	18	1	1	23.4	3.5
TV-Flare_3	2020-05-11T07:33:17	Gas Analys	Tovil Greer	52.7	1014	14.2	0	0	24.7	8.4
TV-Flare_3	2020-05-20T13:20:12	Gas Analys	Tovil Greer	40.4	1019	20.3	0	0	37	2.3
TV-Flare_3	2020-05-28T08:22:29	Gas Analys	Tovil Greer	54.9	1032	11.5	0	0	20.8	12.8
TV-Flare_3	2020-06-01T07:36:18	Gas Analys	Tovil Greer	45.5	1020	20.4	0	0	31.7	2.4
TV-Flare_3	2020-06-12T07:37:32	Gas Analys	Tovil Greer	40	1002	22.1	0	0	36.7	1.2
TV-Flare_3	2020-06-15T08:32:57	Gas Analys	Tovil Greer	55.7	1014	17.6	0	0	22.6	4.1
TV-Flare_3	2020-06-22T08:33:21	Gas Analys	Tovil Greer	57.6	1023	11	0	0	18.6	12.8
TV-Flare_3	2020-07-13T08:54:44	Gas Analys	Tovil Greer	54.6	1023	15.4	0	0	22.5	7.5
TV-Flare_3	2020-06-29T08:26:36	Gas Analys	Tovil Greer	42.5	1008	21.2	0	0	35.2	1.1
TV-Flare_3	2020-07-09T08:41:23	Gas Analys	Tovil Greer	37.9	1010	23.1	1	0	38.7	0.3
TV-Flare_3	2020-08-03T10:47:26	Gas Analys	Tovil Greer	37.3	1013	23.1	0	0	39.5	0.1
TV-Flare_3	2020-07-20T08:37:41	Gas Analys	Tovil Greer	73.8	1020	3.2	0	0	4.4	18.6
TV-Flare_3	2020-07-27T09:06:36	Gas Analys	Tovil Greer	38.8	1007	22.8	0	0	37.3	1.1
TV-Flare_3	2020-08-11T09:07:21	Gas Analys	Tovil Greer	57.3	1012	11.7	0	0	18.9	12.1
TV-Flare_3	2020-08-18T08:32:59	Gas Analys	Tovil Greer	62.9	1007	8	0	0	14.4	14.7
TV-Flare_3	2020-09-01T08:37:39	Gas Analys	Tovil Greer	69.9	1018	5.1	1	0	8.2	16.8
TV-Flare_3	2020-09-07T08:43:32	Gas Analys	Tovil Greer	73.9	1021	2.8	0	0	4.1	19.2
TV-Flare_3	2020-09-21T08:54:30	Gas Analys	Tovil Greer	47.5	1015	17.2	0	1	26.4	8.9

Sample Point	Date	Source	Location	Balance (%)	Barometric Pressure (MB)	Carbon Dioxide (%)	Carbon Monoxide (PPM)	Hydrogen Sulfide (PPM)	Methane (%)	Oxygen (%)
TV-Flare_3	2020-09-16T08:20:24	Gas Analys	Tovil Greer	72.1	1019	3.6	0	1	5.7	18.6
TV-Flare_3	2020-09-28T08:36:41	Gas Analys	Tovil Greer	46.4	1010	21.8	0	0	29.7	2.1
TV-Flare_J	2020-09-28T08:38:36	Gas Analys	Tovil Greer	47	1010	20.8	1	0	29.1	3.1
TV-Flare_J	2020-09-16T08:23:37	Gas Analys	Tovil Greer	70.7	1019	4.2	0	0	7	18.1
TV-Flare_J	2020-09-21T08:57:02	Gas Analys	Tovil Greer	47.8	1016	18.5	0	1	26.9	6.8
TV-Flare_J	2020-09-07T08:46:47	Gas Analys	Tovil Greer	74	1021	2.8	0	0	4	19.2
TV-Flare_J	2020-09-01T08:39:02	Gas Analys	Tovil Greer	67.1	1018	6.9	0	0	10.7	15.3
TV-Flare_J	2020-08-18T08:35:29	Gas Analys	Tovil Greer	63.1	1007	8.1	0	0	14.3	14.5
TV-Flare_J	2020-08-11T09:08:44	Gas Analys	Tovil Greer	58	1012	11.3	0	0	18.4	12.3
TV-Flare_J	2020-07-27T09:08:30	Gas Analys	Tovil Greer	44.4	1007	18.7	0	0	32	4.9
TV-Flare_J	2020-07-20T08:40:12	Gas Analys	Tovil Greer	71.8	1020	4.4	0	0	6.3	17.5
TV-Flare_J	2020-08-03T10:48:21	Gas Analys	Tovil Greer	35.9	1013	23.1	0	0	40.1	0.9
TV-Flare_J	2020-07-09T08:44:21	Gas Analys	Tovil Greer	39.3	1010	22.9	0	0	37.4	0.4
TV-Flare_J	2020-06-29T08:29:52	Gas Analys	Tovil Greer	38.2	1007	21.3	0	0	38.5	2
TV-Flare_J	2020-07-13T08:57:27	Gas Analys	Tovil Greer	50	1023	15.4	0	2	27.7	6.9
TV-Flare_J	2020-06-22T08:37:57	Gas Analys	Tovil Greer	52.6	1023	12.2	0	0	24.3	10.9
TV-Flare_J	2020-06-15T08:35:20	Gas Analys	Tovil Greer	51.5	1014	17.3	0	1	26.1	5.1
TV-Flare_J	2020-06-12T07:40:29	Gas Analys	Tovil Greer	42.3	1002	19.7	0	0	34.6	3.4
TV-Flare_J	2020-06-01T07:39:58	Gas Analys	Tovil Greer	46.7	1020	17.8	0	1	30.9	4.6
TV-Flare_J	2020-05-28T08:24:15	Gas Analys	Tovil Greer	57.7	1033	10.4	0	0	18.9	13
TV-Flare_J	2020-05-20T13:24:36	Gas Analys	Tovil Greer	46.8	1019	15.8	0	1	31	6.4
TV-Flare_J	2020-05-11T07:37:17	Gas Analys	Tovil Greer	52.1	1014	14.6	0	0	25.5	7.8
TV-Flare_J	2020-04-20T07:34:10	Gas Analys	Tovil Greer	54	1017	19	0	1	24.3	2.7
TV-Flare_J	2020-05-04T08:00:38	Gas Analys	Tovil Greer	67.3	1016	6.7	0	0	10.5	15.5
TV-Flare_J	2020-04-27T07:32:54	Gas Analys	Tovil Greer	47.2	1006	16.6	0	3	30.2	6
TV-Flare_J	2020-02-10T08:41:45	Gas Analys	Tovil Greer	44	1001	17.2	1	0	33.6	5.2
TV-Flare_J	2020-02-03T10:55:51	Gas Analys	Tovil Greer	59.1	1015	14.3	1	3	19.6	7
TV-Flare_J	2020-02-24T08:35:20	Gas Analys	Tovil Greer	42	1011	17.9	0	0	36.3	3.8
TV-Flare_J	2020-01-13T08:45:23	Gas Analys	Tovil Greer	55.5	1015	16.6	0	1	23.1	4.8
TV-Flare_J	2020-01-06T09:50:58	Gas Analys	Tovil Greer	31.1	1022	23.2	1	0	44.7	1
TV-Flare_J	2020-01-20T08:58:32	Gas Analys	Tovil Greer	56.5	1046	13.2	0	0	20.9	9.4
TV-Flare_J	2020-01-31T10:47:23	Gas Analys	Tovil Greer	35	1008	21.1	0	0	42.5	1.4
TV-Flare_J	2020-04-15T07:36:34	Gas Analys	Tovil Greer	62.3	1024	12.2	0	2	16.6	8.9
TV-Flare_J	2020-04-06T08:24:36	Gas Analys	Tovil Greer	52.6	1013	13.4	0	2	25	9
TV-Flare_J	2020-03-30T09:14:44	Gas Analys	Tovil Greer	59.9	1034	12.7	0	0	18.9	8.5
TV-Flare_J	2020-03-23T10:04:06	Gas Analys	Tovil Greer	62.2	1027	10	0	0	16.1	11.7
TV-Flare_J	2020-03-19T10:59:52	Gas Analys	Tovil Greer	46	1025	18.3	0	2	30.6	5.1
TV-Flare_J	2020-03-11T08:30:18	Gas Analys	Tovil Greer	42.8	1011	21.3	0	1	35	0.9
TV-Flare_J	2020-03-02T12:25:12	Gas Analys	Tovil Greer	57.7	989	14.7	0	0	20.5	7.1
TV-S5	2020-03-02T12:57:08	Gas Analys	Tovil Greer	55.9	988	14.6	0	0	20.7	8.8
TV-S5	2020-01-20T09:35:46	Gas Analys	Tovil Greer	75	1045	2.5	0	0	1.8	20.7
TV-S5	2020-02-10T09:40:44	Gas Analys	Tovil Greer	70.5	1000	4.6	0	0	7.4	17.5
TV-S5	2020-04-20T09:13:22	Gas Analys	Tovil Greer	50.8	1016	21.4	1	1	25.3	2.5
TV-S5	2020-06-01T10:47:23	Gas Analys	Tovil Greer	78.3	1014	0.1	0	1	0	21.6
TV-S5	2020-07-13T09:31:01	Gas Analys	Tovil Greer	43	1022	21.3	1	1	32	3.7
TV-S5	2020-09-16T09:10:02	Gas Analys	Tovil Greer	70.8	1019	4.8	1	1	6.8	17.6
TV-S5	2020-08-03T12:43:38	Gas Analys	Tovil Greer	62.7	1013	8.5	1	0	14.1	14.7
TV-S6	2020-09-16T09:38:31	Gas Analys	Tovil Greer	78.5	1020	1.6	1	2	0	19.9
TV-S6	2020-08-03T10:59:00	Gas Analys	Tovil Greer	78.4	1013	2.4	0	0	0.3	18.9
TV-S6	2020-07-13T09:58:21	Gas Analys	Tovil Greer	78.4	1023	2.4	1	0	0	19.2
TV-S6	2020-06-01T08:30:55	Gas Analys	Tovil Greer	77.5	1020	3.9	0	0	0.1	18.5
TV-S6	2020-04-20T09:38:06	Gas Analys	Tovil Greer	76.9	1016	4.6	0	1	0	18.5
TV-S6	2020-03-02T11:59:28	Gas Analys	Tovil Greer	80	988	5.4	0	0	0	14.6
TV-S6	2020-02-10T10:05:56	Gas Analys	Tovil Greer	80.9	1000	5.3	0	0	0.1	13.7
TV-S6	2020-01-20T09:58:58	Gas Analys	Tovil Greer	76.7	1048	3.4	0	0	0.1	19.8