

041/3319/MJT/AGT

31st January 2021

Mr M Lindop
Redrow Homes
Redrow House
Brunel Road
Wakefield 41
Wakefield
West Yorkshire
WF2 0XG



Registered in England 07068066

Parkhill
Wetherby
West Yorkshire
LS22 5DZ

T 01937 545 330
www.lithos.co.uk

Dear Mathew

Bradley Villa Farm, Huddersfield – Gas risk assessment

Further to issue of our Geoenvironmental Appraisal Report (No. 3319/1, dated March 2019), gas monitoring at the above site has now been completed and we are able to issue this supplementary letter report, together with copies of the monitoring results. This letter, which should be read in conjunction with Report No 3319/1, reviews soil-gas conditions, assesses risks and details any mitigation measures required to render the site suitable for the proposed development.

Background. The site is located approximately 2 km south of Brighouse town centre at NGR SE151205 and comprises a single parcel of land of approximately 11.8 hectares (29 acres).

In relation to hazardous gas, the above-mentioned report found former underground coal workings underlie land to the north of the site, and likely encroach beneath the site, albeit at sufficient depth to not pose a risk to surface stability.

Based on the above, it was considered that the site might be at risk from hazardous gas and therefore monitoring wells were installed in 13 boreholes. Details of the individual installations are appended.

The proposed residential development is assumed to comprise traditional 2 storey housing. The houses will be founded on traditional strip footings.

Scope of works. The generation potential of the gas source was initially considered to be Low and this has been confirmed by the monitoring results obtained. Consequently, in accordance with CIRIA Report C665, given the proposed residential end use, 6 visits have been completed over a 3 month period, between October 2020 and January 2021.

A standard procedure was followed in accordance with CIRIA guidance; this procedure involved measurement, in the following order of:

- Atmospheric temperature, pressure and ambient oxygen concentration on site immediately prior to and on completion of monitoring
- Methane, oxygen and carbon dioxide concentrations and flow rates using a Gas Data GFM430 infra-red gas analyser
- Standing water level using a dipmeter



Gas monitoring results. The monitoring results are enclosed and summarised below:

| Monitoring well | Response zone | Range of concentrations (% v/v) | | | Range of steady flow rates (litre/hour) |
|-----------------|-------------------------------|---------------------------------|----------------|-------------|---|
| | | Methane | Carbon Dioxide | Oxygen | |
| PH101 | 3.0m – 6.0m (Mudstone) | 0.0 | 0.2 – 3.3 | 10.7 – 20.1 | 0.0 – 5.7 |
| PH102 | 3.0m – 6.0m (Mudstone) | 0.0 | 1.0 – 3.5 | 5.5 – 16.4 | 0.0 – 20.4 |
| PH103 | 1.5m – 4.5m (Mudstone & Coal) | 0.0 | 2.1 – 2.8 | 16.3 – 19.9 | 0.0 |
| PH104 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.4 – 2.7 | 16.8 – 20.9 | 0.0 |
| PH105 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.4 – 4.8 | 2.3 – 20.4 | 0.0 – 20.0 |
| PH106 | 1.5m – 4.5m (Mudstone & Coal) | 0.0 | 0.7 – 2.8 | 17.5 – 20.8 | 0.0 |
| PH107 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.5 – 6.5 | 8.4 – 19.0 | 0.0 – 11.7 |
| PH108 | 1.5m – 4.5m (Mudstone) | 0.0 | 2.2 – 3.9 | 9.2 – 12.7 | 0.0 – 8.0 |
| PH109 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.1 – 3.7 | 10.5 – 21.1 | 0.0 |
| PH110 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.4 – 3.1 | 15.3 – 19.1 | 0.0 |
| PH111 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.5 – 3.6 | 12.2 – 19.3 | 0.0 |
| PH112 | 1.5m – 4.5m (Mudstone) | 0.0 | 0.2 – 2.9 | 16.1 – 20.4 | 0.0 |
| PH113 | 1.5m – 4.5m (Mudstone) | 0.0 | 3.8 – 4.3 | 7.0 – 15.3 | 0.0 |

Note: Atmospheric pressures varied between 985mb and 1048mb.

In accordance with the DETR approach, a default value of 0.1 litres/hour has been used in the absence of any recorded flows; i.e. the limit of detection of the flow rate equipment.

During 1 of the 6 monitoring visits, atmospheric pressure was falling, including 1 where the pressure was below 1000mb. Plots of atmospheric pressure versus time, with the monitoring visits indicated, are appended to this letter report which suggest that visits 1, 3 and 6 were undertaken following periods of sustained decrease in atmospheric pressure.

Current guidance. Generic Notes (01 Site Characterisation) outlining how monitoring results are interpreted are enclosed.

Current gas regime. The proposed residential development comprises low rise residential housing. Consequently, the gas regime has been characterised in accordance with the Situation B (traffic light) methodology outlined in CIRIA Report C665.

Based on worst-case (peak) gas concentrations and steady flows, Gas Screening Values (GSVs) for methane and carbon dioxide are 0.0 and 1.33 respectively. These GSVs equate to an **Amber 1** gas regime (traffic light) for this site.

Other than on visit one in PH107 only, no concentrations of carbon dioxide were recorded above the Amber 1 trigger value of 5%. No methane was detected in any boreholes on any occasion.

However, the depleted oxygen concentrations indicate the potential for 'blackdamp'. Blackdamp is characterized by low oxygen and high nitrogen. In shallow coal workings the gas is predominantly carbon dioxide. Carbon dioxide is produced by the bacterial degradation of the organic matter in coal residues. This bacterial action uses oxygen and produces carbon dioxide. Monitoring data which shows this reduction of oxygen (replaced by nitrogen), indicates a high rate of bacterial action in the mineworkings and therefore the possibility of increasing concentrations of carbon dioxide in the future.

Furthermore, where mineworkings are flooded (permanently or temporarily) the carbon dioxide dissolves into groundwater, meaning it may not be detected during monitoring at the surface.

The source of gas at this site is mineworkings. These are most likely flooded given their depth and the groundwater levels recorded, but are also likely to be affected by changes in groundwater levels. This is supported by the presence of shallow groundwater which clearly fluctuates throughout the monitoring period. Given the above, a precautionary approach to gas protection is recommended. Therefore, whilst, a case could be made for Green classification on the basis of concentrations of carbon dioxide and methane, Amber 1 is considered most appropriate given the depleted oxygen, changeable flows and the nature of the source.

Scope of protection measures.

Based on the site characterisation (Traffic Light) discussed above, the proposed foundation solution, and with reference to the gas protection “scoring” system outlined in BS8485:2015+A1:2019, Lithos consider that the following protective measures should be incorporated in all new dwellings:

| Traffic light classification and “score” req’d by BS8485# | Floor slab (BS8485 “score”) | Protective measures | |
|---|--|--|--|
| | | Sub-floor ventilation (BS8485 “score”) | Membrane |
| | | | Type (BS8485 “score”) |
| Amber 1 3.5 | <p>Select one from:</p> <ul style="list-style-type: none"> i. Block & Beam – (0). ii. Reinforced ground bearing slab – (0.5). iii. Reinforced, cast in-situ suspended slab (with minimal and suitably sealed service penetrations & joints) – (1.5). iv. Reinforced ground bearing raft (with limited service penetrations cast into slab). Note: the venting area through any downstand beam should be 3 times greater than that provided by the side ventilation (air bricks) – (1.5). | <p>Select one from:</p> <p>Passive sub-floor ventilation; venting layer could be:</p> <ul style="list-style-type: none"> i. A min. 150mm clear void (2.5), or ii. A proprietary void former providing an equivalent clear void depth of 60mm; see Section B7 in BS8485 (2.5), or iii. Min. 300mm thick blanket of min. 20mm single size gravel (1.0). <p>Min. ventilation = 1,500 mm²/m run of external wall (via air bricks on each of 2 opposite sides), with 100mm pipes at 1.75m centres or honeycombing of any sub-floor sleeper walls.</p> | <p>Gas resistant membrane meeting all of the following criteria:</p> <ul style="list-style-type: none"> • sufficiently impervious to gases with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • a minimum 0.4 mm thickness (1600g polyethylene) reinforced membrane (virgin polymer) • verified in accordance with CIRIA C735[∞] <p>(2.0)</p> |

Footnotes:

Scores are broadly based on those outlined in BS8485:2015+A1:2019 (for Characteristic Situations 2 & 3, and Building Type A).

∞ In accordance with CIRIA C735, a Verification Plan should be prepared which outlines the activities (inspection and testing), the relevant personnel, and the type of records to be collected. Gas membranes need to be visually inspected to establish possible damage. For Amber 2 sites inspection & verification should be carried out by an independent third party. However, whilst conflicts of interest in verification should be avoided, the Developer’s staff on site could undertake inspection & verification on Amber 1 sites. In all circumstances, the verifier should be competent, experienced and suitably trained.

Note NHBC guidance only requires membranes to be certified on Amber 2 sites. However, BS8485 is considered to ‘outrank’ NHBC guidance, and it would be prudent to comply with this Standard and CIRIA C735. Furthermore, (YALPAG) local authorities have issued guidance requiring a detailed verification method statement in advance of the construction phase. This should address how gas measures will be installed and what verification information will be provided to demonstrate that installation has been carried out in accordance with the appropriate guidance.

1. A combination of two or more of the three types of protection measures (slab, ventilation & membrane) should be used to achieve the BS8485 score.
2. The membrane should always be lapped and sealed in accordance with BRE\Environment Agency Report BR 414 (2001) – “Protective Measures for housing on gas-contaminated land”. The membrane should be **continuous** across internal walls & the cavity, and there should be a **cavity tray** in external walls.
3. In all cases there should be minimum penetration of floor slab by **services**; any penetrations should be suitably sealed.
4. Integral **garages** with occupied rooms above, or direct access through a doorway from the garage to the house, should be provided with the same protective measures as the rest of the dwelling. Buildings with basement car parks (with ventilation in accordance with Building Regulations) may not require gas resistant membranes.

In accordance with recent YALPAG guidance¹, a detailed verification method statement should be issued to Kirklees Council in advance of the construction phase. This should address how the gas protection measures will be installed and what verification information will be provided to demonstrate the installation has been carried out in accordance with the appropriate guidance. As a minimum the report should include (but not be limited to):

- A summary of the gas risk assessment.
- The gas protection measures proposed and confirmation they will meet the gas protection requirements for the lifetime of the development.
- Technical drawings showing how the gas protection measures will be incorporated.
- Formal qualifications/experience/training of the person carrying out the installation.
- Formal qualifications/experience/training of the person carrying out the verification.
- Clear demonstration of the independence of the person carrying out the verification.
- The manufacturer's specification of the gas protection membrane to be used.
- Full details of what the verification process will comprise and at what stage verification will be carried out.
- Details of how any non-conformance will be dealt with.
- Details of the number of plots to be validated.
- Timeline of when during the build, each of the gas protection measures will be installed.
- Details of management measures proposed to ensure how damage to the membrane will be prevented prior to the floor being installed, post installation.
- Details of how all site personnel (including follow-on trades) will be made aware of the presence of the membrane and that damage to the membrane must be prevented.
- Details of the extent of overlap and method of sealing.

BRE\Environment Agency Report BR 414 (2001) – “*Protective Measures for housing on gas-contaminated land*” provides a practical guide to good practice for the detailing and construction of passive soil gas protection measures for new residential development. Of particular relevance are a list of ‘Watchpoints’, which offer practical information for installation and buildability.

We trust the above is sufficient for your present needs, but should you have any queries please contact the undersigned.

Yours sincerely

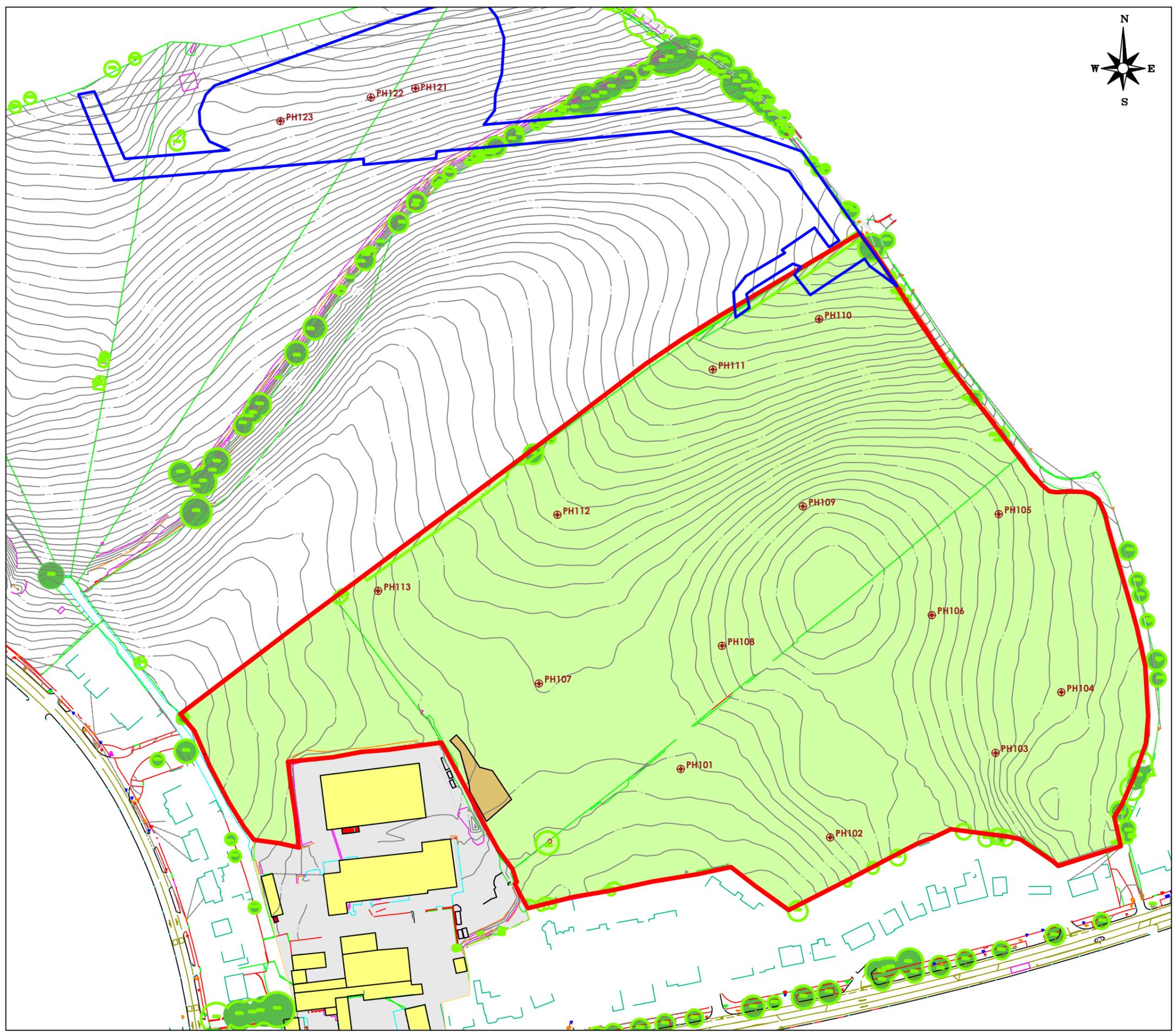


Matt Thompson
Associate Director
for and on behalf of
LITHOS CONSULTING LIMITED

Enclosures:

Drawing 3319/10 – Borehole Location Plan
Gas Monitoring Results
Plot of Atmospheric vs Time
Borehole Logs

¹ Verification Requirements for Gas Protection Systems - Technical Guidance for Developers, Landowners and Consultants. Yorkshire and Lincolnshire Pollution Advisory Group, December 2016.



- NOTES
- MONITORING WELL LOCATION
 - GRASS & OVERGROWN AREAS
 - BUILDING
 - GRAVEL OR HARDCORE SURFACING
 - APPROXIMATE SITE BOUNDARY (RESIDENTIAL)
 - APPROXIMATE SITE BOUNDARY (DRAINAGE INFRASTRUCTURE)

| REV. | DESCRIPTION | DATE |
|------|-------------|------|
| | | |



info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

REDROW
HOMES

VILLA FARM,
BRADLEY

DRAWING TITLE
MONITORING WELL LOCATIONS

| | | | | | | |
|---------|--------|-------|------------|--------------|-------------|-------------------------------------|
| DRAWN | MJT | DATE | 05/10/2020 | STATUS | FOR COMMENT | <input type="checkbox"/> |
| CHECKED | REG | DATE | 05/10/2020 | FOR APPROVAL | DRAFT | <input type="checkbox"/> |
| | | | | | FINAL | <input checked="" type="checkbox"/> |
| SCALE | 1:2000 | SHEET | A3 | DRAWING NO. | 3319/10 | REVISION |



| | | | | | |
|---|-------------------------------|------------------------------|----------------------------------|---------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 1 of 12 | |
| Date: 12/10/2020 | Arrival Time: 09:30 | Depart Time: 16:06 | Operator: Lander Latta | | |

| | | | | | | | |
|--|--|------------------------|----|------------------------|----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | ND | O₂: | 20.9 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|--|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | 2.98 | ND | 3.3 | ND | 3.3 | 10.7 | 8.4 | 0.0 | 10.0 | 5.84 | Bailed at 09:50 to 5.22m (20l). Remonitored at 15:32. |
| PH102 | 4.77 | ND | 1.2 | ND | 1.0 | 16.4 | ND | ND | ND | 5.49 | Bailed at 11:22 to 5.18m (2l) |
| PH103 | 3.70 | ND | ND | ND | ND | 19.9 | ND | ND | ND | 4.15 | Bailed at 11:13 to 3.93m (2l) |
| PH104 | 1.44 | ND | ND | ND | ND | 20.9 | ND | ND | ND | 4.50 | Bailed at 10:24 to 3.94m (25l). Remonitored at 15:42 |
| PH105 | 1.49 | ND | 0.8 | ND | 0.4 | 20.4 | ND | ND | ND | 4.23 | Bailed at 10:44 to 3.69m (20l). Remonitored at 15:48 |
| PH106 | 1.17 | ND | ND | ND | ND | 20.8 | ND | ND | ND | 4.34 | Bailed at 11:00 to 3.36m (25l). Remonitored at 15:55 |
| PH107 | 3.52 | ND | 6.5 | ND | 6.5 | 9.3 | 16.3 | 11.7 | 30.0 | 4.33 | Bailed at 14:00 to 3.9m (2l) |
| PH108 | 3.51 | ND | 2.2 | ND | 2.2 | 12.7 | 36.3 | 0.8 | 60.0 | 4.52 | Bailed at 15:08 to 4.01m (5l) |
| PH109 | 1.31 | ND | 0.3 | ND | 0.1 | 21.1 | ND | ND | ND | 4.09 | Bailed at 15:25 to 3.60m (15l). Valve open. Closed at 14:50. Monitored at 15:20. Remonitored at 16:05. |
| PH110 | 4.34 | ND | 2.0 | ND | 1.9 | 19.0 | ND | ND | ND | 4.45 | |
| PH111 | 2.34 | ND | 1.7 | ND | 1.7 | 18.1 | ND | ND | ND | 4.52 | Bailed at 14:43 to 4.01m (15l) |
| PH112 | 1.59 | ND | 1.0 | ND | 0.2 | 20.4 | 0.7 | 0.0 | 5.0 | 4.25 | Bailed at 14:30 to 3.50m (15l) |
| PH113 | 2.70 | ND | 4.3 | ND | 4.3 | 15.0 | ND | ND | ND | 4.37 | Bailed at 14:12 to 2.89m (15l). Fast Recharge. |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | Site Data: | | | Weather Station Data (Ainley Top Station) | | | | | |
|-----------------------|-----------------------------------|----------------------------|--------|---|-------|-------|-------|-------|-------|
| | Temp (°C): | Barometric Pressure Trend: | | Falling | | | | | |
| Time: | 09:30 | 12:40 | 16:06 | 00:04 | 05:59 | 09:29 | 12:39 | 16:04 | 19:59 |
| Pressure (mb): | 995 | 992 | 987 | 1048 | 1043 | 1041 | 1038 | 1034 | 1034 |
| | Weather Conditions: | | Cloudy | | | | | | |
| | Surface Ground Conditions: | | Damp | | | | | | |

| | |
|-----------------|--|
| Remarks: | |
|-----------------|--|



| | | | | | |
|----------------------------------|----------------------|---------------------|------------------|----------------|--|
| Job Title: | | | | Job No: | |
| Bradley Villa Farm, Huddersfield | | | | 3319 | |
| Client: | | | | Sheet : | |
| Redrow Homes | | | | 2 of 12 | |
| Date: | Arrival Time: | Depart Time: | Operator: | | |
| 12/10/2020 | 09:30 | 16:06 | Lander Latta | | |

| | | | | | | | |
|--|--|------------------------|----|------------------------|----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | ND | O₂: | 20.9 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | 3.00 | ND | 0.2 | ND | 0.2 | 20.1 | 17.5 | 0.0 | 10.0 | 5.85 | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | 1.47 | ND | 1.3 | ND | 0.6 | 20.7 | ND | ND | ND | 4.49 | |
| PH105 | 1.94 | ND | 3.0 | ND | 0.7 | 20.2 | ND | ND | ND | 4.25 | |
| PH106 | 1.18 | ND | 2.7 | ND | 0.7 | 20.5 | ND | ND | ND | 4.34 | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | 2.10 | ND | 0.9 | ND | 0.7 | 20.5 | ND | ND | ND | 4.07 | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | 2.70 | ND | 4.3 | ND | 4.3 | 15.0 | ND | ND | ND | 4.37 | |
| PH121 | | | | | | | | | | | |
| PH122 | | | | | | | | | | | |
| PH123 | | | | | | | | | | | |

| | |
|--|------------------------------|
| Equipment Used: | Next Calibration Date |
| Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | 22/02/2021 |

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | Site Data: | | | Weather Station Data (Ainley Top Station) | | | | | |
|-----------------------|-----------------------------------|----------------------------|--------|---|-------|-------|-------|-------|-------|
| | Temp (°C): | Barometric Pressure Trend: | | Falling | | | | | |
| Time: | 09:30 | 12:40 | 16:06 | 00:04 | 05:59 | 09:29 | 12:39 | 16:04 | 19:59 |
| Pressure (mb): | 995 | 992 | 987 | 1048 | 1043 | 1041 | 1038 | 1034 | 1034 |
| | Weather Conditions: | | Cloudy | | | | | | |
| | Surface Ground Conditions: | | Damp | | | | | | |

| | CH ₄ | CO ₂ | O ₂ |
|-----------------|-----------------|-----------------|----------------|
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|---|-------------------------------|------------------------------|----------------------------------|---------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 3 of 12 | |
| Date: 29/10/2020 | Arrival Time: 08:54 | Depart Time: 12:33 | Operator: Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.4 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|--|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | 2.68 | ND | 1.8 | ND | 1.8 | 15.4 | 115.8 | 0.0 | 110.0 | 5.81 | Bailed 09:09 - 09:20 to 5.24m (20l). 4.22m Dip at 09:33. 2.90m Dip at 10:35. |
| PH102 | 4.31 | ND | 2.3 | ND | 2.3 | 7.1 | 2.0 | 0.0 | 3.0 | 5.50 | |
| PH103 | 3.19 | ND | 2.2 | ND | 2.2 | 16.6 | ND | ND | ND | 4.13 | |
| PH104 | 1.26 | ND | 2.3 | ND | 0.9 | 18.8 | ND | ND | ND | 4.43 | Bailed 09:43 - 09:51 to 3.36m (20l). 1.48m Dip at 10:24. |
| PH105 | 1.31 | ND | 2.8 | ND | 2.2 | 12.1 | 0.7 | 0.0 | 2.0 | 4.28 | Bailed 09:58 - 10:06 to 3.58m (17l). 3.10m Dip at 10:29. |
| PH106 | 0.50 | ND | 2.2 | ND | 2.2 | 17.5 | ND | ND | ND | 4.35 | Bailed 10:12 - 10:20 to 1.94m (30l). 0.53m Dip at 10:31. |
| PH107 | 3.25 | ND | 4.8 | ND | 4.8 | 8.4 | 7.6 | 0.0 | 10.0 | 4.29 | |
| PH108 | 3.23 | ND | 3.7 | ND | 3.7 | 10.0 | ND | ND | ND | 4.44 | |
| PH109 | 1.14 | ND | 1.5 | ND | 1.5 | 10.5 | ND | ND | ND | 4.03 | Bailed 10:47 - 10:55 to 3.31m (16l). 1.43m Dip at 11:22. |
| PH110 | 4.43 | ND | 3.0 | ND | 3.0 | 18.2 | ND | ND | ND | 4.51 | |
| PH111 | 1.22 | ND | 2.2 | ND | 2.2 | 16.4 | ND | ND | ND | 4.55 | Bailed 11:07 - 11:17 to 1.29m (25l). |
| PH112 | 1.07 | ND | 1.4 | ND | 1.4 | 19.1 | ND | ND | ND | 4.25 | Bailed 11:45 - 11:54 to 3.57m (28l). 1.50m Dip at 12:08. |
| PH113 | 2.55 | ND | 4.2 | ND | 4.2 | 15.3 | ND | ND | ND | 4.30 | |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|-----------------------------------|---------|--------|--|-------|-------|-------------|-------|-------|
| | Site Data: | | | Weather Station Data (Baillif Bridge Station) | | | | | |
| | Temp (°C): | 8 to 11 | | Barometric Pressure Trend: | | | Fluctuating | | |
| Time: | 08:54 | 11:58 | 12:33 | 00:04 | 08:54 | 11:59 | 12:34 | 17:59 | 19:59 |
| Pressure (mb): | 988 | 983 | 985 | 1004 | 1008 | 1006 | 1005 | 1005 | 1006 |
| | Weather Conditions: | | Cloudy | | | | | | |
| | Surface Ground Conditions: | | Wet | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|----------------------------------|----------------------|---------------------|------------------|----------------|--|
| Job Title: | | | | Job No: | |
| Bradley Villa Farm, Huddersfield | | | | 3319 | |
| Client: | | | | Sheet : | |
| Redrow Homes | | | | 4 of 12 | |
| Date: | Arrival Time: | Depart Time: | Operator: | | |
| 29/10/2020 | 08:54 | 12:33 | Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.4 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | | | | | | | | | | | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | | | | | | | | | | | |
| PH105 | 2.38 | ND | 2.4 | ND | 2.4 | 17.0 | 121.0 | 0.0 | 650.0 | 4.29 | |
| PH106 | | | | | | | | | | | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | | | | | | | | | | | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | | | | | | | | | | | |

| | |
|--|------------------------------|
| Equipment Used: | Next Calibration Date |
| Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | 22/02/2021 |

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|-----------------------------------|---------|--------|--|-------|-------|-------------|-------|-------|
| | Site Data: | | | Weather Station Data (Baillif Bridge Station) | | | | | |
| | Temp (°C): | 8 to 11 | | Barometric Pressure Trend: | | | Fluctuating | | |
| Time: | 08:54 | 11:58 | 12:33 | 00:04 | 08:54 | 11:59 | 12:34 | 17:59 | 19:59 |
| Pressure (mb): | 988 | 983 | 985 | 1004 | 1008 | 1006 | 1005 | 1005 | 1006 |
| | Weather Conditions: | | Cloudy | | | | | | |
| | Surface Ground Conditions: | | Wet | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|---|-------------------------------|------------------------------|----------------------------------|---------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 5 of 12 | |
| Date: 12/11/2020 | Arrival Time: 09:23 | Depart Time: 12:35 | Operator: Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.5 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | 2.44 | ND | 0.8 | ND | 0.8 | 19.4 | 119.8 | 0.0 | 40.0 | 5.80 | Bailed 09:40 - 10:05 to 4.09m (15l). Bailed lost down well. Top of Bailer at 4.88m. Remonitored at 12:10. |
| PH102 | 3.75 | ND | 3.5 | ND | 3.5 | 9.3 | 68.8 | 20.4 | 100.0 | 5.51 | |
| PH103 | 3.79 | ND | 2.8 | ND | 2.8 | 16.3 | ND | ND | ND | 4.18 | |
| PH104 | 1.87 | ND | 0.4 | ND | 0.4 | 20.0 | ND | ND | ND | 4.48 | |
| PH105 | 1.53 | ND | 4.8 | ND | 4.8 | 2.3 | 80.9 | 5.7 | 40.0 | 4.26 | |
| PH106 | 1.57 | ND | 1.3 | ND | 1.3 | 18.0 | ND | ND | ND | 4.35 | |
| PH107 | 2.27 | ND | 0.5 | ND | 0.5 | 19.0 | ND | ND | ND | 4.26 | |
| PH108 | 3.07 | ND | 3.9 | ND | 3.9 | 10.0 | 63.0 | 8.0 | 25.0 | 4.48 | |
| PH109 | 1.55 | ND | 1.1 | ND | 1.1 | 19.4 | ND | ND | ND | 3.93 | |
| PH110 | 4.44 | ND | 3.1 | ND | 3.1 | 16.4 | ND | ND | ND | 4.54 | |
| PH111 | 3.10 | ND | 3.6 | ND | 3.6 | 13.9 | ND | ND | ND | 4.55 | |
| PH112 | 2.02 | ND | 0.8 | ND | 0.8 | 19.4 | ND | ND | ND | 4.27 | |
| PH113 | 2.75 | ND | 3.9 | ND | 3.9 | 12.0 | ND | ND | ND | 4.30 | |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|--|-------|--|-------|-------|-------|-------|-------|-------|
| | Site Data: Temp (°C): 8 to 9 | | Weather Station Data (Baillif Bridge Station) Barometric Pressure Trend: Rising then Falling | | | | | | |
| Time: | 09:23 | 11:24 | 12:35 | 00:04 | 09:24 | 11:24 | 12:34 | 17:59 | 19:59 |
| Pressure (mb): | 991 | 989 | 992 | 1003 | 1011 | 1012 | 1012 | 1012 | 1010 |
| | Weather Conditions: Sunny | | Surface Ground Conditions: Damp | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|----------------------------------|----------------------|---------------------|------------------|----------------|--|
| Job Title: | | | | Job No: | |
| Bradley Villa Farm, Huddersfield | | | | 3319 | |
| Client: | | | | Sheet : | |
| Redrow Homes | | | | 6 of 12 | |
| Date: | Arrival Time: | Depart Time: | Operator: | | |
| 12/11/2020 | 09:23 | 12:35 | Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.5 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | 2.56 | ND | 0.5 | ND | 0.5 | 19.8 | 121.2 | 0.0 | 60.0 | 4.87 | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | | | | | | | | | | | |
| PH105 | | | | | | | | | | | |
| PH106 | | | | | | | | | | | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | | | | | | | | | | | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | | | | | | | | | | | |

| | |
|--|------------------------------|
| Equipment Used: | Next Calibration Date |
| Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | 22/02/2021 |

| | | | |
|------------|---|--|--|
| Key | | | |
| ND | None Detected | | |
| NR | Not Recorded | | |
| 1.0 | Recorded value does not breach trigger levels | | |
| 5.0 | Recorded value breaches trigger level 1 | | |
| 10.0 | Recorded value breaches trigger level 2 | | |

| | | | | | | | | | |
|-----------------------|-----------------------------------|--------|-------|---|-------|-------|-------|-------|-------|
| | Site Data: | | | Weather Station Data (Baillif Bridge Station) | | | | | |
| | Temp (°C): | 8 to 9 | | Barometric Pressure Trend: Rising then Falling | | | | | |
| Time: | 09:23 | 11:24 | 12:35 | 00:04 | 09:24 | 11:24 | 12:34 | 17:59 | 19:59 |
| Pressure (mb): | 991 | 989 | 992 | 1003 | 1011 | 1012 | 1012 | 1012 | 1010 |
| | Weather Conditions: | | Sunny | | | | | | |
| | Surface Ground Conditions: | | Damp | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|---|-------------------------------|------------------------------|----------------------------------|---------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 7 of 12 | |
| Date: 01/12/2020 | Arrival Time: 09:04 | Depart Time: 11:42 | Operator: Lander Latta | | |



| | | | | | | |
|--|--|---------------------------|----------------------------|----------------------------|--|--|
| Gas Monitoring Results: | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: ND | CO₂: 0.1 | O₂: 20.4 | | |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------|----------|-------------------------------------|---------------------|--|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum | Steady | Time to fall from highest to steady | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | litre/hr | litre/hr | secs | | |
| PH101 | 2.41 | ND | 0.8 | ND | 0.8 | 19.9 | 120.0 | 0.0 | 60.0 | 4.89 | |
| PH102 | 3.65 | ND | 2.5 | ND | 2.5 | 12.4 | -15.2 | 0.0 | 20.0 | 5.48 | |
| PH103 | 4.00 | ND | 2.7 | ND | 2.7 | 17.4 | ND | ND | ND | 4.26 | |
| PH104 | 2.61 | ND | 2.7 | ND | 2.7 | 16.8 | ND | ND | ND | 4.41 | |
| PH105 | 1.47 | ND | 4.1 | ND | 4.1 | 9.9 | ND | ND | ND | 4.25 | Bailed 10:02 - 10:11 to 3.71m (17l). Remonitored at 11:25. |
| PH106 | 1.53 | ND | 0.9 | ND | 0.9 | 18.7 | ND | ND | ND | 4.35 | |
| PH107 | 2.92 | ND | 1.0 | ND | 1.0 | 19.0 | ND | ND | ND | 4.26 | |
| PH108 | 2.56 | ND | 3.8 | ND | 3.8 | 9.8 | -23.4 | -3.7 | 30.0 | 4.51 | |
| PH109 | 1.61 | ND | 1.2 | ND | 1.2 | 19.0 | ND | ND | ND | 3.75 | |
| PH110 | 4.43 | ND | 2.9 | ND | 2.9 | 17.3 | ND | ND | ND | 4.53 | |
| PH111 | 2.71 | ND | 0.5 | ND | 0.5 | 19.3 | ND | ND | ND | 4.56 | |
| PH112 | 1.97 | ND | 2.9 | ND | 2.9 | 16.4 | ND | ND | ND | 4.27 | |
| PH113 | 2.73 | ND | 4.0 | ND | 4.0 | 9.8 | ND | ND | ND | 4.30 | |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|-----------------------------------|--------|-------|--|-------|-------|---------------------|-------|-------|
| | Site Data: | | | Weather Station Data (Ainley Top Station) | | | | | |
| | Temp (°C): | 2 to 5 | | Barometric Pressure Trend: | | | Rising then Falling | | |
| Time: | 09:04 | 10:43 | 11:42 | 00:04 | 09:04 | 10:44 | 11:44 | 17:59 | 19:59 |
| Pressure (mb): | 1008 | 1007 | 1007 | 1046 | 1050 | 1050 | 1050 | 1049 | 1048 |
| | Weather Conditions: | | Clear | | | | | | |
| | Surface Ground Conditions: | | Dry | | | | | | |

| | |
|-----------------|--|
| Remarks: | |
|-----------------|--|

| | | | | | |
|----------------------------------|----------------------|---------------------|------------------|----------------|--|
| Job Title: | | | | Job No: | |
| Bradley Villa Farm, Huddersfield | | | | 3319 | |
| Client: | | | | Sheet : | |
| Redrow Homes | | | | 8 of 12 | |
| Date: | Arrival Time: | Depart Time: | Operator: | | |
| 01/12/2020 | 09:04 | 11:42 | Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.4 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | | | | | | | | | | | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | | | | | | | | | | | |
| PH105 | 2.38 | ND | 1.3 | ND | 1.3 | 19.1 | 108.7 | 13.5 | 100.0 | 4.26 | |
| PH106 | | | | | | | | | | | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | | | | | | | | | | | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | | | | | | | | | | | |

| | |
|--|------------------------------|
| Equipment Used: | Next Calibration Date |
| Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | 22/02/2021 |

| | |
|------------|---|
| Key | |
| ND | None Detected |
| NR | Not Recorded |
| 1.0 | Recorded value does not breach trigger levels |
| 5.0 | Recorded value breaches trigger level 1 |
| 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|-----------------------------------|--------|-------|--|-------|-------|---------------------|-------|-------|
| | Site Data: | | | Weather Station Data (Ainley Top Station) | | | | | |
| | Temp (°C): | 2 to 5 | | Barometric Pressure Trend: | | | Rising then Falling | | |
| Time: | 09:04 | 10:43 | 11:42 | 00:04 | 09:04 | 10:44 | 11:44 | 17:59 | 19:59 |
| Pressure (mb): | 1008 | 1007 | 1007 | 1046 | 1050 | 1050 | 1050 | 1049 | 1048 |
| | Weather Conditions: | Clear | | | | | | | |
| | Surface Ground Conditions: | Dry | | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|---|-------------------------------|------------------------------|----------------------------------|---------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 9 of 12 | |
| Date: 17/12/2020 | Arrival Time: 09:00 | Depart Time: 11:22 | Operator: Lander Latta | | |



| | | | | | | | |
|--|--|------------------------|----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | ND | CO₂: | 0.1 | O₂: | 20.5 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------|----------|-------------------------------------|---------------------|--|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum | Steady | Time to fall from highest to steady | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | litre/hr | litre/hr | secs | | |
| PH101 | 2.09 | ND | 1.2 | ND | 1.2 | 19.5 | 119.8 | 5.7 | 40.0 | 4.88 | |
| PH102 | 3.42 | ND | 2.5 | ND | 2.5 | 11.5 | ND | ND | ND | 5.48 | |
| PH103 | 3.40 | ND | 2.2 | ND | 2.2 | 16.6 | ND | ND | ND | 4.15 | |
| PH104 | 1.37 | ND | 0.4 | ND | 0.4 | 20.2 | ND | ND | ND | 4.44 | |
| PH105 | 1.00 | ND | 3.1 | ND | 3.1 | 15.1 | ND | ND | ND | 4.27 | Bailed 09:38 - 09:46 to 3.14m (15l). Remonitored at 11:08. |
| PH106 | 0.64 | ND | 1.3 | ND | 1.3 | 19.9 | ND | ND | ND | 4.34 | |
| PH107 | 2.46 | ND | 1.2 | ND | 1.2 | 18.6 | ND | ND | ND | 4.26 | |
| PH108 | 2.32 | ND | 3.3 | ND | 3.3 | 10.7 | ND | ND | ND | 4.46 | |
| PH109 | 1.01 | ND | 0.8 | ND | 0.8 | 19.8 | ND | ND | ND | 3.92 | Bailed 10:01 - 10:06 tp 3.12m (14l). Remonitored at 11:20. |
| PH110 | 4.45 | ND | 2.6 | ND | 2.6 | 15.3 | ND | ND | ND | 4.50 | |
| PH111 | 1.96 | ND | 1.8 | ND | 1.8 | 15.6 | ND | ND | ND | 4.55 | |
| PH112 | 1.59 | ND | 2.6 | ND | 2.6 | 16.1 | ND | ND | ND | 4.25 | |
| PH113 | 2.66 | ND | 4.1 | ND | 4.1 | 7.0 | ND | ND | ND | 4.30 | |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|-----------------------------------|--------|--|-------|-------|-------|-------|-------|-------|
| | Site Data: | | Weather Station Data (Halifax_HX3 Station) | | | | | | |
| | Temp (°C): | 6 to 7 | Barometric Pressure Trend: Rising then Steady | | | | | | |
| Time: | 09:00 | 10:32 | 11:22 | 00:01 | 08:59 | 10:30 | 11:21 | 17:57 | 19:58 |
| Pressure (mb): | 990 | 988 | 990 | 985 | 989 | 990 | 990 | 990 | 989 |
| | Weather Conditions: | Clear | | | | | | | |
| | Surface Ground Conditions: | Damp | | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | |
|---|-------------------------------|------------------------------|----------------------------------|----------------------------|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 |
| Client: Redrow Homes | | | | Sheet : 10 of 12 |
| Date: 17/12/2020 | Arrival Time: 09:00 | Depart Time: 11:22 | Operator: Lander Latta | |



| | | | | | |
|--|--|---------------------------|----------------------------|----------------------------|--|
| Gas Monitoring Results: | | | | | |
| Ambient Concentration (% Volume): | | CH₄: ND | CO₂: 0.1 | O₂: 20.5 | |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | | | | | | | | | | | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | | | | | | | | | | | |
| PH105 | 1.31 | ND | 0.7 | ND | 0.7 | 19.6 | 118.9 | 20.0 | 70.0 | 4.28 | |
| PH106 | | | | | | | | | | | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | 1.08 | ND | 1.8 | ND | 1.8 | 19.3 | ND | ND | ND | 3.94 | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | | | | | | | | | | | |

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|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | |
|-----------------------|--|-------|--|--|-------|-------|-------|-------|-------|
| | Site Data: Temp (°C): 6 to 7 | | | Weather Station Data (Halifax_HX3 Station) Barometric Pressure Trend: Rising then Steady | | | | | |
| Time: | 09:00 | 10:32 | 11:22 | 00:01 | 08:59 | 10:30 | 11:21 | 17:57 | 19:58 |
| Pressure (mb): | 990 | 988 | 990 | 985 | 989 | 990 | 990 | 990 | 989 |
| | Weather Conditions: Clear | | Surface Ground Conditions: Damp | | | | | | |

| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:

| | | | | | |
|---|-------------------------------|------------------------------|-----------------------------|----------------------------|--|
| Job Title: Bradley Villa Farm, Huddersfield | | | | Job No: 3319 | |
| Client: Redrow Homes | | | | Sheet : 11 of 12 | |
| Date: 12/01/2021 | Arrival Time: 09:00 | Depart Time: 11:46 | Operator: L Latta | | |



| | | | | | | | |
|--|--|------------------------|-----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | 0.0 | CO₂: | 0.0 | O₂: | 20.5 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------|----------|-------------------------------------|---------------------|---|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum | Steady | Time to fall from highest to steady | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | litre/hr | litre/hr | secs | | |
| PH101 | 1.71 | ND | 2.0 | ND | 2.0 | 18.2 | 115.6 | 4.4 | 50.0 | 4.95 | |
| PH102 | 3.39 | ND | 3.5 | ND | 3.5 | 5.5 | 61.4 | 9.0 | 30.0 | 5.48 | |
| PH103 | 3.24 | ND | 2.1 | ND | 2.1 | 18.2 | ND | ND | ND | 4.13 | |
| PH104 | 1.44 | ND | 1.7 | ND | 1.7 | 18.3 | ND | ND | ND | 4.45 | |
| PH105 | 0.82 | ND | 3.5 | ND | 3.5 | 17.7 | 120.2 | 0.0 | 180.0 | 4.26 | |
| PH106 | 0.69 | ND | 1.7 | ND | 1.7 | 19.3 | ND | ND | ND | 4.32 | Well bailed at 09:56 -23l to 3.48m. Remonitored at 11:32. |
| PH107 | 2.30 | ND | 1.8 | ND | 1.8 | 17.6 | ND | ND | ND | 4.29 | |
| PH108 | 2.28 | ND | 3.5 | ND | 3.5 | 9.2 | 68.1 | 0.0 | 15.0 | 4.48 | |
| PH109 | 0.88 | ND | 0.6 | ND | 0.6 | 20.0 | ND | ND | ND | 3.89 | Well bailed at 10:24 -15l to 3.16m. Remonitred at 11:37. |
| PH110 | 4.01 | ND | 0.4 | ND | 0.4 | 19.1 | ND | ND | ND | 4.44 | |
| PH111 | 1.20 | ND | 2.4 | ND | 2.4 | 12.2 | ND | ND | ND | 4.55 | |
| PH112 | 1.48 | ND | 1.6 | ND | 1.6 | 19.1 | ND | ND | ND | 4.25 | |
| PH113 | 2.61 | ND | 3.8 | ND | 3.8 | 11.3 | ND | ND | ND | 4.27 | |

| | |
|--|--|
| Equipment Used: Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | Next Calibration Date 22/02/2021 |
|--|--|

| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

| | | | | | | | | | | | | | |
|-----------------------|-------------------|--------|-------|---|-------|-------|-------|-------|-------|-----------------|-----|------|------|
| | Site Data: | | | Weather Station Data (Mount Weather Station) | | | | | | | | | |
| | Temp (°C): | 0 to 3 | | Barometric Pressure Trend: Rising | | | | | | | | | |
| Time: | 09:00 | 10:42 | 11:46 | 00:00 | 06:00 | 09:00 | 10:40 | 11:45 | 15:30 | Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Pressure (mb): | 995 | 995 | 995 | 1006 | 1010 | 1013 | 1014 | 1015 | 1017 | Trigger level 2 | 5.0 | 10.0 | 10.0 |

| | |
|-----------------------------------|--------|
| Weather Conditions: | Clear. |
| Surface Ground Conditions: | Wet. |

| | |
|-----------------|--|
| Remarks: | |
|-----------------|--|

| | | | | | |
|----------------------------------|----------------------|---------------------|------------------|----------------|--|
| Job Title: | | | | Job No: | |
| Bradley Villa Farm, Huddersfield | | | | 3319 | |
| Client: | | | | Sheet : | |
| Redrow Homes | | | | 12 of 12 | |
| Date: | Arrival Time: | Depart Time: | Operator: | | |
| 12/01/2021 | 09:00 | 11:46 | L Latta | | |



| | | | | | | | |
|--|--|------------------------|-----|------------------------|-----|-----------------------|------|
| Gas Monitoring Results: | | | | | | | |
| Ambient Concentration (% Volume): | | CH₄: | 0.0 | CO₂: | 0.0 | O₂: | 20.5 |

| Monitoring Point | Groundwater level (m) bgl | Concentrations | | | | | Gas Flow Rates | | | Bottom of well m | Remarks |
|------------------|------------------------------|--------------------------|------------------------|--------------------------|------------------------|-----------------------|-------------------------------|--------------------|---|---------------------|---------|
| | | Initial / Highest | | Steady concentrations | | Lowest concn | Initial / Maximum litre/hr | Steady litre/hr | Time to fall from highest to steady secs | | |
| | | CH ₄ % v/v | CO ₂ (%) | CH ₄ % v/v | CO ₂ (%) | O ₂ (%) | | | | | |
| PH101 | | | | | | | | | | | |
| PH102 | | | | | | | | | | | |
| PH103 | | | | | | | | | | | |
| PH104 | | | | | | | | | | | |
| PH105 | | | | | | | | | | | |
| PH106 | 0.89 | ND | 2.8 | ND | 2.8 | 18.0 | ND | ND | ND | 4.32 | |
| PH107 | | | | | | | | | | | |
| PH108 | | | | | | | | | | | |
| PH109 | 0.98 | ND | 3.7 | ND | 3.7 | 18.3 | ND | ND | ND | 3.89 | |
| PH110 | | | | | | | | | | | |
| PH111 | | | | | | | | | | | |
| PH112 | | | | | | | | | | | |
| PH113 | | | | | | | | | | | |

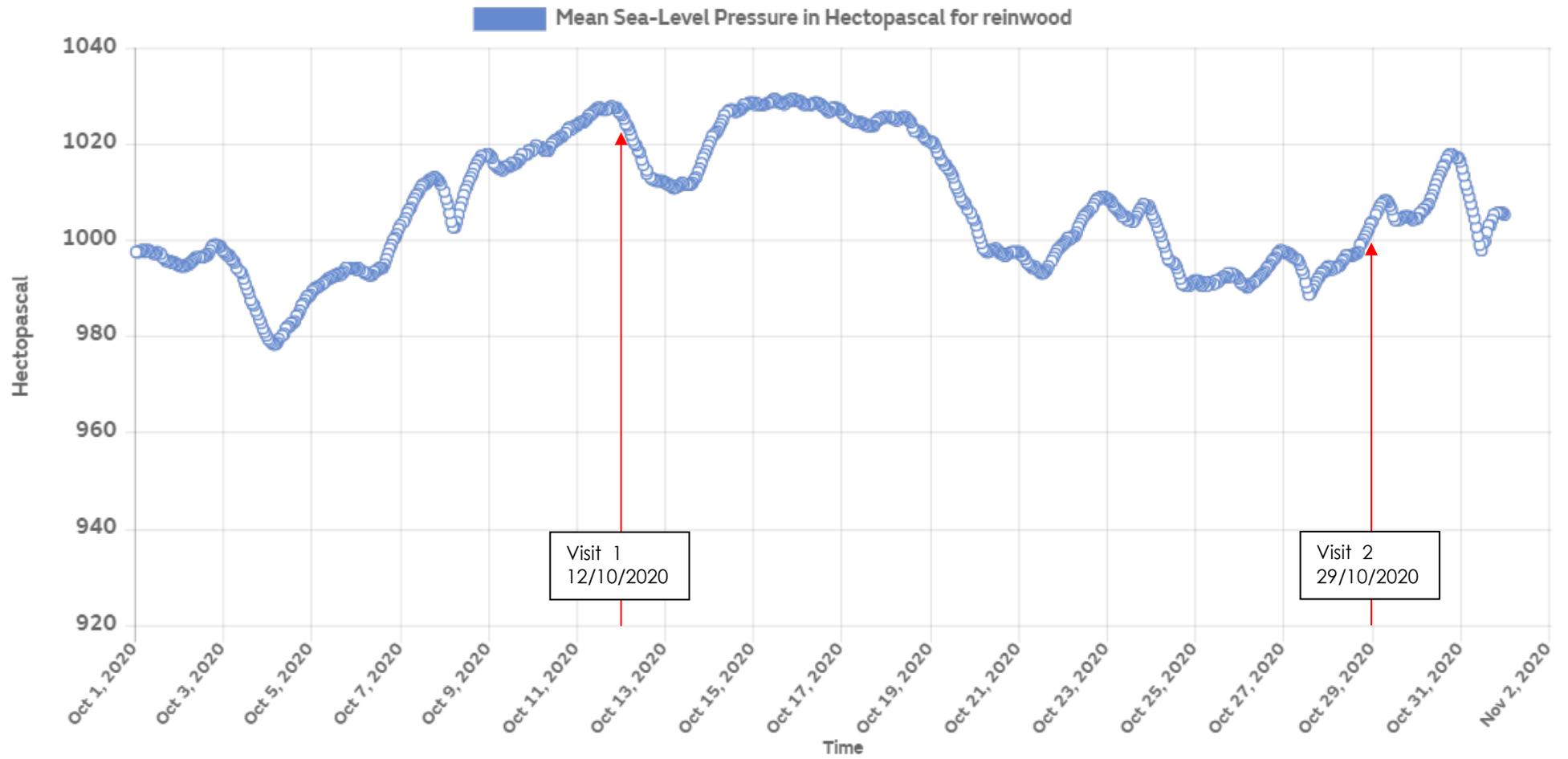
| | |
|--|------------------------------|
| Equipment Used: | Next Calibration Date |
| Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter | 22/02/2021 |

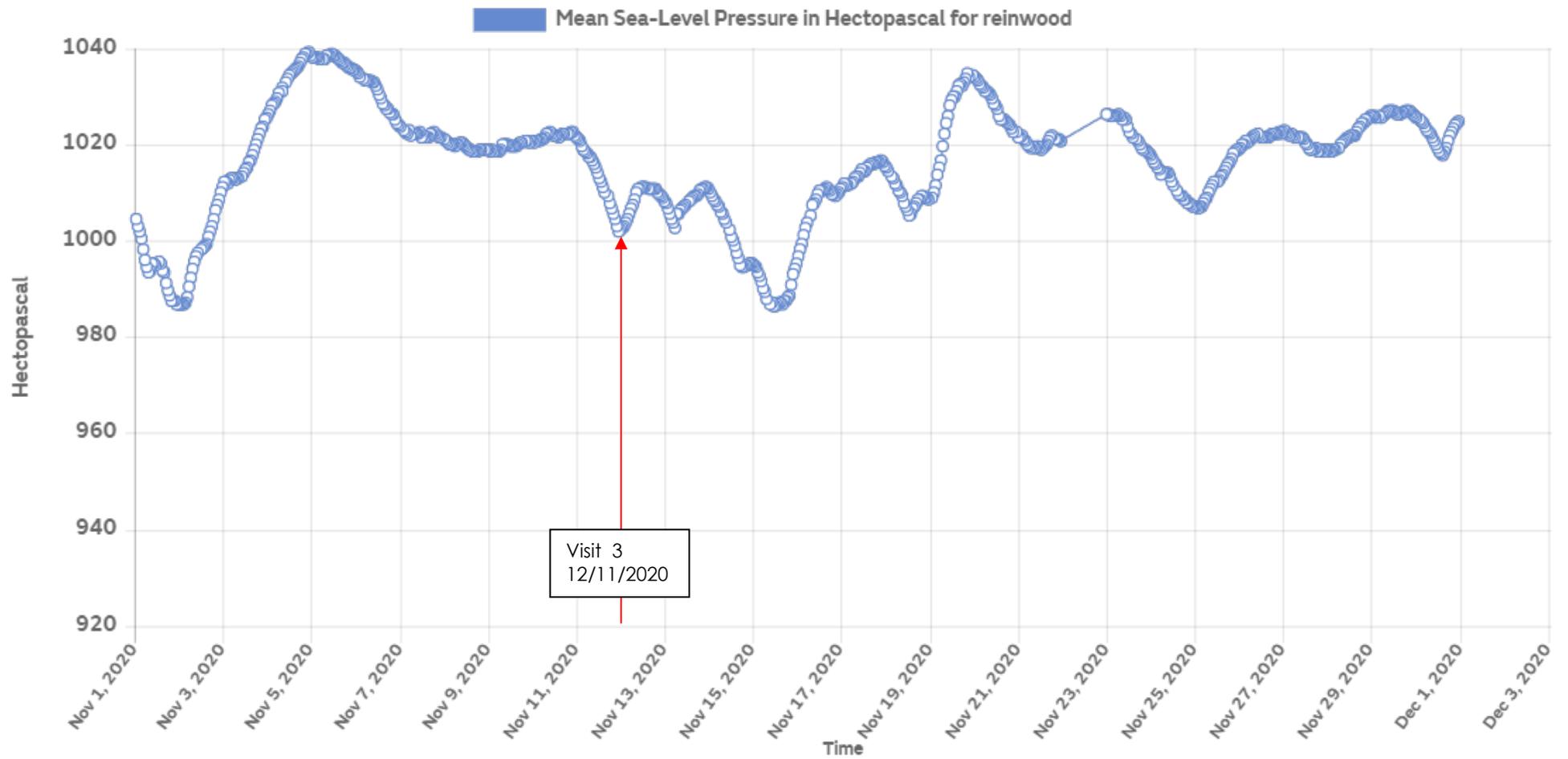
| | | |
|------------|------|---|
| Key | ND | None Detected |
| | NR | Not Recorded |
| | 1.0 | Recorded value does not breach trigger levels |
| | 5.0 | Recorded value breaches trigger level 1 |
| | 10.0 | Recorded value breaches trigger level 2 |

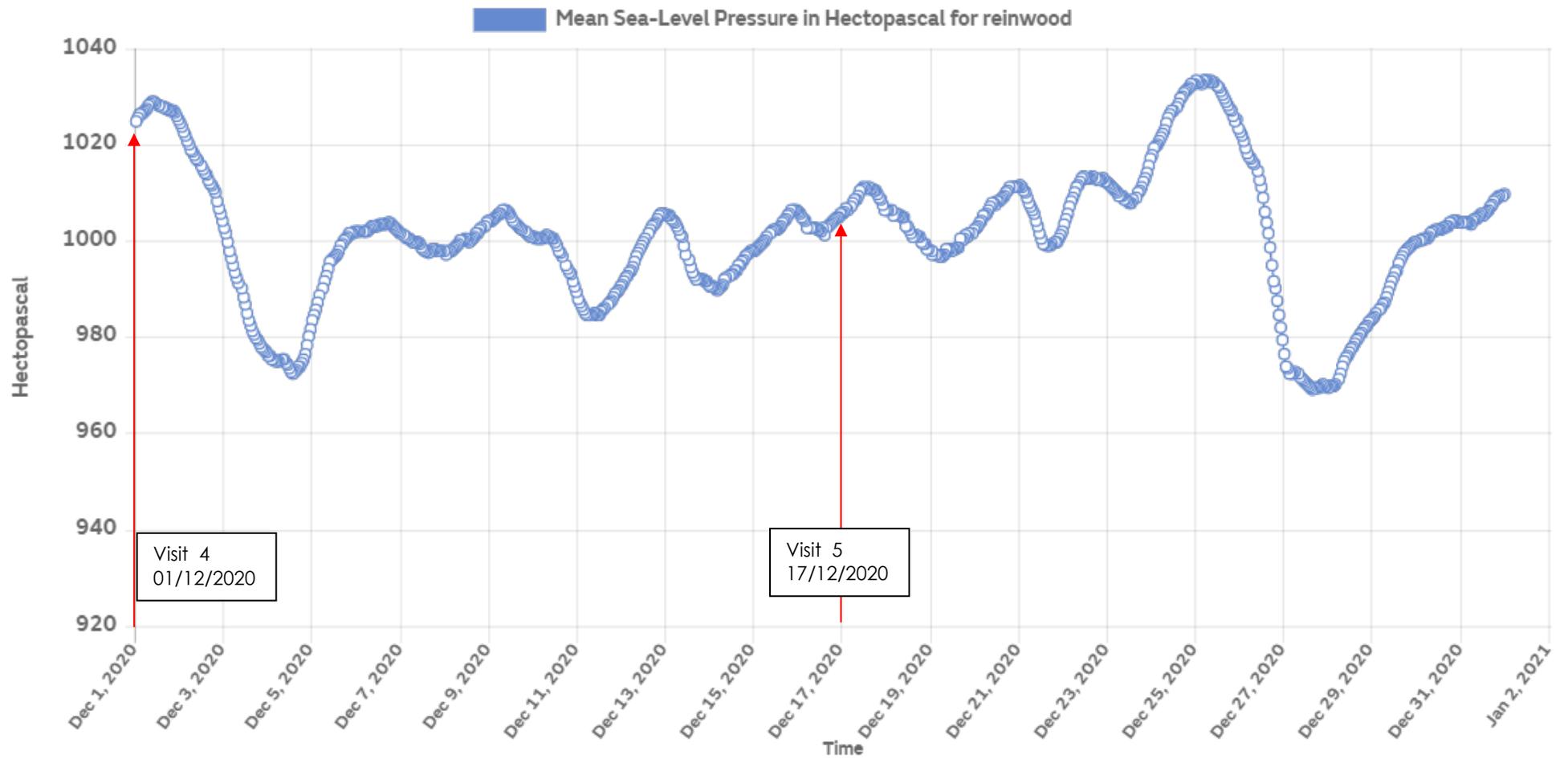
| | | | | | | | | | |
|-----------------------|-----------------------------------|--------|--------|---|-------|-------|--------|-------|-------|
| | Site Data: | | | Weather Station Data (Mount Weather Station) | | | | | |
| | Temp (°C): | 0 to 3 | | Barometric Pressure Trend: | | | Rising | | |
| Time: | 09:00 | 10:42 | 11:46 | 00:00 | 06:00 | 09:00 | 10:40 | 11:45 | 15:30 |
| Pressure (mb): | 995 | 995 | 995 | 1006 | 1010 | 1013 | 1014 | 1015 | 1017 |
| | Weather Conditions: | | Clear. | | | | | | |
| | Surface Ground Conditions: | | Wet. | | | | | | |

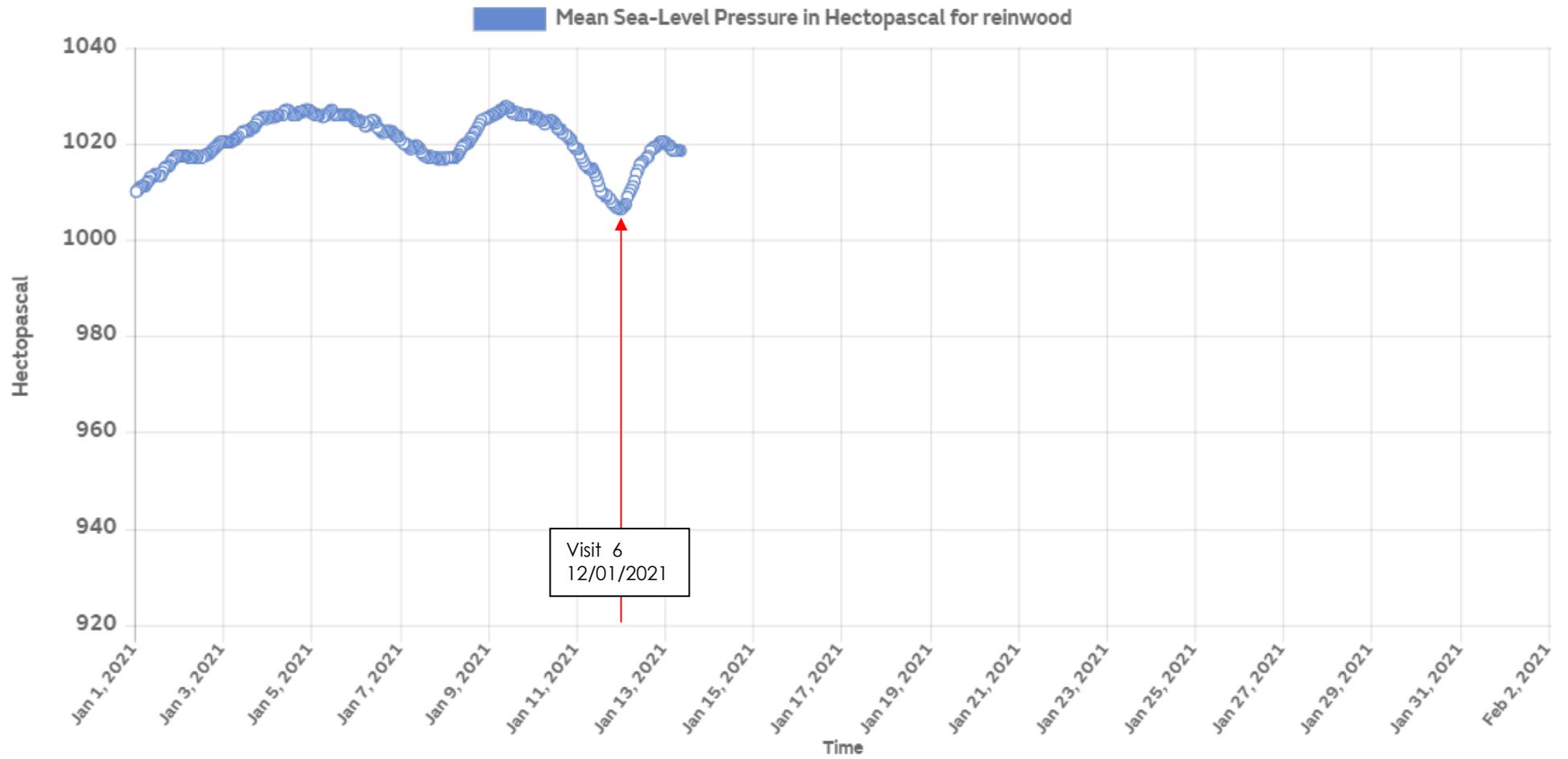
| | | | |
|-----------------|-----------------------|-----------------------|----------------------|
| | CH₄ | CO₂ | O₂ |
| Trigger level 1 | 1.0 | 5.0 | 16.0 |
| Trigger level 2 | 5.0 | 10.0 | 10.0 |

Remarks:









Borehole Log

Borehole No.

PH101

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415179.00 - 420463.23

Hole Type
PH

Location: Huddersfield

Level: 161.35

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|------|---------------|-----------------------------|------|---------|-----------|-----------|------------|--|----|
| | | Depth (m) | Type | Results | | | | | |
| | | | | | | | Overburden | | |
| | | | | | 0.60 | 160.75 | | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | 6.00 | 155.35 | | End of borehole at 6.00 m | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | | | | | | 10 |

Remarks

Borehole Log

Borehole No.

PH102

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415256.97 - 420427.53

Hole Type
PH

Location: Huddersfield

Level: 162.45

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|------|---------------|-----------------------------|------|---------|-----------|-----------|---|---------------------|---|
| | | Depth (m) | Type | Results | | | | | |
| | | | | | 1.00 | 161.45 | Overburden | | 1 |
| | | | | | | | MUDSTONE: Recovered as slightly sandy angular to sub-angular fine to coarse GRAVEL. | | |
| | | | | | 6.00 | 156.45 | End of borehole at 6.00 m | | 6 |
| | | | | | | | | | |

Remarks

Borehole Log

Borehole No.

PH103

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415343.35 - 420471.59

Hole Type
PH

Location: Huddersfield

Level: 161.20

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|------|---------------|-----------------------------|------|---------|-----------|-----------|--------|---|----|
| | | Depth (m) | Type | Results | | | | | |
| | | | | | 0.80 | 160.40 | | Overburden | |
| | | | | | | | | MUDSTONE: Recovered as slightly sandy angular to sub-angular fine to coarse GRAVEL. | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | 3.95 | 157.25 | | | |
| | | | | | 4.15 | 157.05 | | | |
| | | | | | 4.50 | 156.70 | | | |
| | | | | | | | | COAL | 4 |
| | | | | | | | | MUDSTONE: Recovered as slightly sandy angular to sub-angular fine to coarse GRAVEL. | |
| | | | | | | | | End of borehole at 4.50 m | |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | | | | | | 10 |

Remarks

Borehole Log

Borehole No.

PH104

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415377.70 - 420503.32

Hole Type
PH

Location: Huddersfield

Level: 159.95

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|------|---------------|-----------------------------|------|---------|-----------|-----------|--------|--|-----------------------------|
| | | Depth (m) | Type | Results | | | | | |
| | | | | | 0.50 | 159.45 | | Overburden | |
| | | | | | | | | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 1 2 3 4 |
| | | | | | 4.50 | 155.45 | | End of borehole at 4.50 m | 5 6 7 8 9 10 |

Remarks

Borehole Log

Borehole No.

PH105

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415345.07 - 420596.23

Hole Type
PH

Location: Huddersfield

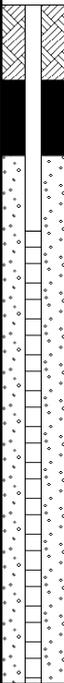
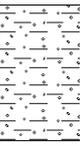
Level: 161.60

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|--|-----------------------------|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.90 | 160.70 |  | Overburden | |
| | | | | | 4.50 | 157.10 |  | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 1 2 3 4 |
| | | | | | | | | End of borehole at 4.50 m | 5 6 7 8 9 10 |

Remarks

Borehole Log

Borehole No.

PH106

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415310.08 - 420543.54

Hole Type
PH

Location: Huddersfield

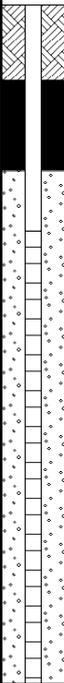
Level: 163.45

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|--|----|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.50 | 162.95 |  | Overburden | |
| | | | | | 2.50 | 160.95 |  | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 1 |
| | | | | | 2.65 | 160.80 |  | COAL | 2 |
| | | | | | 4.50 | 158.95 |  | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 3 |
| | | | | | | | | End of borehole at 4.50 m | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | | | | | | 10 |

Remarks

Borehole Log

Borehole No.

PH107

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415104.96 - 420507.84

Hole Type
PH

Location: Huddersfield

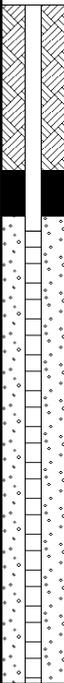
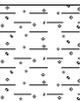
Level: 161.55

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|--|--|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.70 | 160.85 |  | Overburden | |
| | | | | | | |  | MUDSTONE: Recovered as angular to sub-angular fine to coarse GRAVEL. | 1 |
| | | | | | 4.50 | 157.05 | | End of borehole at 4.50 m | 2 3 4 5 6 7 8 9 10 |

Remarks

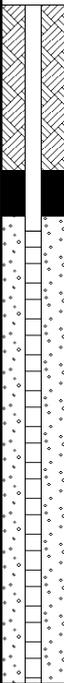
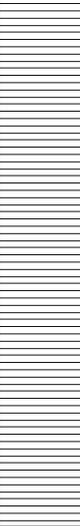
Borehole Log

Borehole No.

PH108

Sheet 1 of 1

| | | | |
|-----------------------------------|------------------|--------------------------------|--------------|
| Project Name: Villa Farm, Bradley | Project No. 3319 | Co-ords: 415200.56 - 420527.55 | Hole Type PH |
| Location: Huddersfield | | Level: 163.45 | Scale 1:50 |
| Client: PS & SP Kershaw | | Dates: 22/09/2020 - 22/09/2020 | Logged By RR |

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|-------------|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 1.00 | 162.45 |  | Overburden | 1 |
| | | | | | 4.50 | 158.95 |  | MUDSTONE: Recovered as yellow brown slightly clayey angular to sub-angular fine to coarse GRAVEL. | 2 3 4 |
| End of borehole at 4.50 m | | | | | | | | 5 6 7 8 9 10 | |

Remarks

Borehole Log

Borehole No.

PH109

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415242.77 - 420600.30

Hole Type
PH

Location: Huddersfield

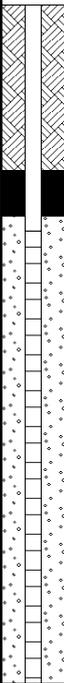
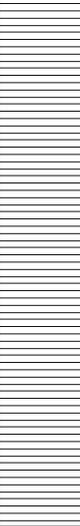
Level: 163.85

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|-----------------------------|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 1.00 | 162.85 |  | Overburden | 1 |
| | | | | | 4.50 | 159.35 |  | MUDSTONE: Recovered as yellow brown slightly clayey angular to sub-angular fine to coarse GRAVEL. | 2 3 4 |
| | | | | | | | | End of borehole at 4.50 m | 5 6 7 8 9 10 |

Remarks

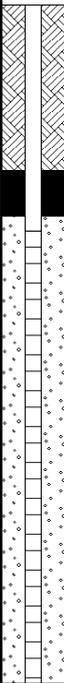
Borehole Log

Borehole No.

PH110

Sheet 1 of 1

| | | | |
|-----------------------------------|------------------|--------------------------------|--------------|
| Project Name: Villa Farm, Bradley | Project No. 3319 | Co-ords: 415251.21 - 420698.02 | Hole Type PH |
| Location: Huddersfield | | Level: 152.95 | Scale 1:50 |
| Client: PS & SP Kershaw | | Dates: 22/09/2020 - 22/09/2020 | Logged By RR |

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|-----------------------------|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 1.00 | 151.95 |  | Overburden | 1 |
| | | | | | | |  | MUDSTONE: Recovered as light brown grey angular to sub-angular fine to coarse GRAVEL. | 2 3 4 |
| | | | | | 4.50 | 148.45 | | End of borehole at 4.50 m | 5 6 7 8 9 10 |

Remarks

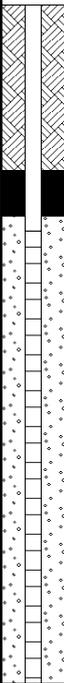
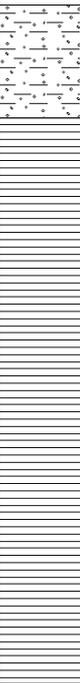
Borehole Log

Borehole No.

PH111

Sheet 1 of 1

| | | | |
|-----------------------------------|------------------|--------------------------------|--------------|
| Project Name: Villa Farm, Bradley | Project No. 3319 | Co-ords: 415195.74 - 420671.72 | Hole Type PH |
| Location: Huddersfield | | Level: 154.25 | Scale 1:50 |
| Client: PS & SP Kershaw | | Dates: 22/09/2020 - 22/09/2020 | Logged By RR |

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|----|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.75 | 153.50 |  | Overburden | |
| | | | | | | | | MUDSTONE: Recovered as light brown orange angular to sub-angular fine to coarse GRAVEL. | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | 4.50 | 149.75 | | End of borehole at 4.50 m | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | | | | | | 10 |

Remarks

Borehole Log

Borehole No.

PH112

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415114.55 - 420595.91

Hole Type
PH

Location: Huddersfield

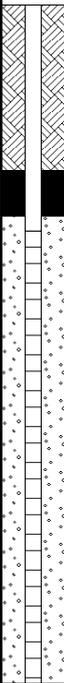
Level: 158.80

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|----|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.40 | 158.40 |  | Overburden | 1 |
| | | | | | | | | MUDSTONE: Recovered as light brown orange angular to sub-angular fine to coarse GRAVEL. | |
| | | | | | 4.50 | 154.30 | | End of borehole at 4.50 m | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | | | | | | 10 |

Remarks

Borehole Log

Borehole No.

PH113

Sheet 1 of 1

Project Name: Villa Farm, Bradley

Project No.
3319

Co-ords: 415020.96 - 420556.20

Hole Type
PH

Location: Huddersfield

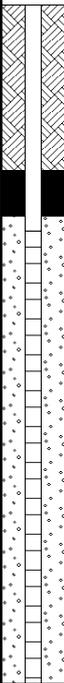
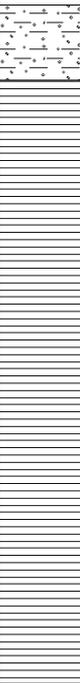
Level: 162.45

Scale
1:50

Client: PS & SP Kershaw

Dates: 22/09/2020 - 22/09/2020

Logged By
RR

| Well | Water Strikes | Samples and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description | |
|--|---------------|-----------------------------|------|---------|-----------|-----------|--|---|-----------------------------|
| | | Depth (m) | Type | Results | | | | | |
|  | | | | | 0.50 | 161.95 |  | Overburden | |
| | | | | | 4.50 | 157.95 | | MUDSTONE: Recovered as light grey slightly clayey angular to sub-angular fine to coarse GRAVEL. | 1 2 3 4 |
| | | | | | | | | End of borehole at 4.50 m | 5 6 7 8 9 10 |

Remarks