



Proof Drill Report

Site: Hirwaun Road, Penywaun

Prepared For: Newydd Housing Association

Issue Date: June 2023

Job No: 17264

REPORT TITLE : **Proof Drill Report: Proposed Residential Development of land adjacent to Hirwaun Road (A4059), Penywaun, CF44 9HW**




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| Executive Summary | | | | | |
|---|--|--|---|----------------|--|
| Site Location and Proposed Development | Newydd Housing Association (The Client) is proposing the residential development of a land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW. The development comprises 19 units with access road, parking areas and associated gardens and soft landscaping. | | | | |
| Site Investigation Works | The site investigation comprised 31 open-hole rotary probe holes. The rotary boreholes were sunk using a SM-15 microdrilling rotary rig by Van Elle Limited. The probe holes were terminated at depths between 33.00m and 42.00m below the current ground level. The location of the boreholes was targeted at the suspected location of the adit beneath the proposed properties and was determined by TFW Group who also supervised the works. | | | | |
| Ground Conditions | BH | Depth (m) | | Stratum | |
| | A Boreholes | GL | - | 9.00/10.00 | MADE GROUND (Driller's Description) |
| | | 9.00/10.00 | - | 18.30/19.00 | MUDSTONE/ SANDSTONE (Driller's Description) |
| | | 18.30/19.00 | - | 20.00/20.60 | Dark MUDSTONE / Coal bands or coal traces (Drillers Description) |
| | | 20.00/20.50 | - | 29.50/30.60 | MUDSTONE/ SANDSTONE (Drillers Description) |
| | | 29.50/30.60 | | 32.00/32.40 | Soft drilling possible Fill (Drillers Description) Boreholes A12, A13, A14, A19 only. Or Soft broken drilling no flush return (Drillers Description) Boreholes A15, A16, A17, A18, A20 only. |
| | | 32.00/32.40 | | 39.00/42.00 | MUDSTONE/ SANDSTONE (Drillers Description) |
| | B Boreholes | GL | - | 9.00/10.00 | MADE GROUND (Driller's Description) |
| | | 9.00/10.00 | - | 20.50/21.00 | MUDSTONE/ SANDSTONE (Driller's Description) |
| | | 20.50/21.00 | - | 22.90/26.00 | Dark MUDSTONE / Coal bands (Driller's description). |
| | | 22.90/26.00 | | 28.00 | Soft broken ground (Drillers Description) Boreholes B1, B2, B3, B4, B5, B8 only. |
| | | 28.00 | - | 33.00 | MUDSTONE / solid drill (Driller's description). |
| | Findings | The site investigation boreholes have found the adit / roadway crossing the site with insufficient rock head cover over soft drill and backfilled workings. The 10:1 ratio for rock head to void has not been achieved and the risk to the proposed development is considered to be high. It is therefore necessary for the workings to be stabilised by drilling and grouting methods. | | | |
| | Proposed Remedial Measures | <p>Drilling and Grouting</p> <p>As previously stated, the rotary boreholes have confirmed that there is a shallow backfilled roadway associated with the adit within the bedrock, and there is insufficient rockhead cover to protect from a collapse of this feature. It is also possible that the feature seen in Borehole Line B has already partially collapsed.</p> <p>Adits were used as access to mines but also for drainage and ventilation of underground mines. Prior to treatment works it is recommended that groundwater monitoring wells are installed in the feature to determine if it is an active conduit for water. If significant water is encountered consideration may need to be given to an alternative method of treatment.</p> <p>Ground stabilisation by drilling and grouting must be carried out prior to development commencing. This should be undertaken in accordance with Chapter 6 'Consolidation of Shallow Abandoned Mine Workings' of CIRIA C758D: 2019 'Abandoned Mine Workings Manual'.</p> <p>Grout is pumped into the working, acting 'to replace or maintain the sub-surface support lost by excavation, and to restrict void migration so that any subsequent development does not experience foundation collapse or major subsidence'.</p> <p>To gain adequate coverage of the area to be treated a series of rotary boreholes are sunk in a grid formation through the workings.</p> | | | |

A closely spaced line of grout holes should be established at either end of the feature, as close to the site boundary as possible, using a spacing of 1.00m. For the internal grid between the two end lines, a spacing of 3.00m is utilised. A sacrificial plastic tube is inserted in each hole to ensure it remains open throughout the grouting procedure. Alternatively, a reusable steel casing can be used. The grid should extend beyond the assumed route of the roadway to ensure it is properly stabilised.

Grout typically comprises a 10:1 mixture of pulverised fuel ash (pfa) to Ordinary Portland cement, batch mixed via a paddle mixer.

Given the backfilled nature of the workings grout should be pumped into the borehole under pressure to ensure adequate treatment. Initially the perimeter / end holes are filled until grout is present at the surface. In this way a grout curtain is established to prevent grout migration to areas outside the stabilisation zone. Grouting is also started at the down dip end of the feature which in the case of this roadway is the northern end.

Where particularly high grout intakes are required the grid size may be reduced with additional intersecting boreholes. Once the grout curtain has been established the internal holes are filled.

Drilling and grouting would reduce the potential risks to tolerable levels.

Once the area has successfully been stabilised reinforced concrete strip foundation or a reinforced concrete raft type foundation/floor slab solution can be constructed within competent shallow ground. The foundations should be capable of spanning a residual crown hole of 1.5m with a cantilever effect on corners of 1.0m. These foundation recommendations would need to be confirmed by a suitable site investigation to determine the strength of the in-situ soils and deeper foundations may be required.

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SECTION 1 Introduction and Proposed Development

Newydd Housing Association (The Client) is proposing the residential development of a land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW. The development comprises 19 units with access road, parking areas and associated gardens and soft landscaping. The proposed site layout can be seen in **Figure 1.1**.

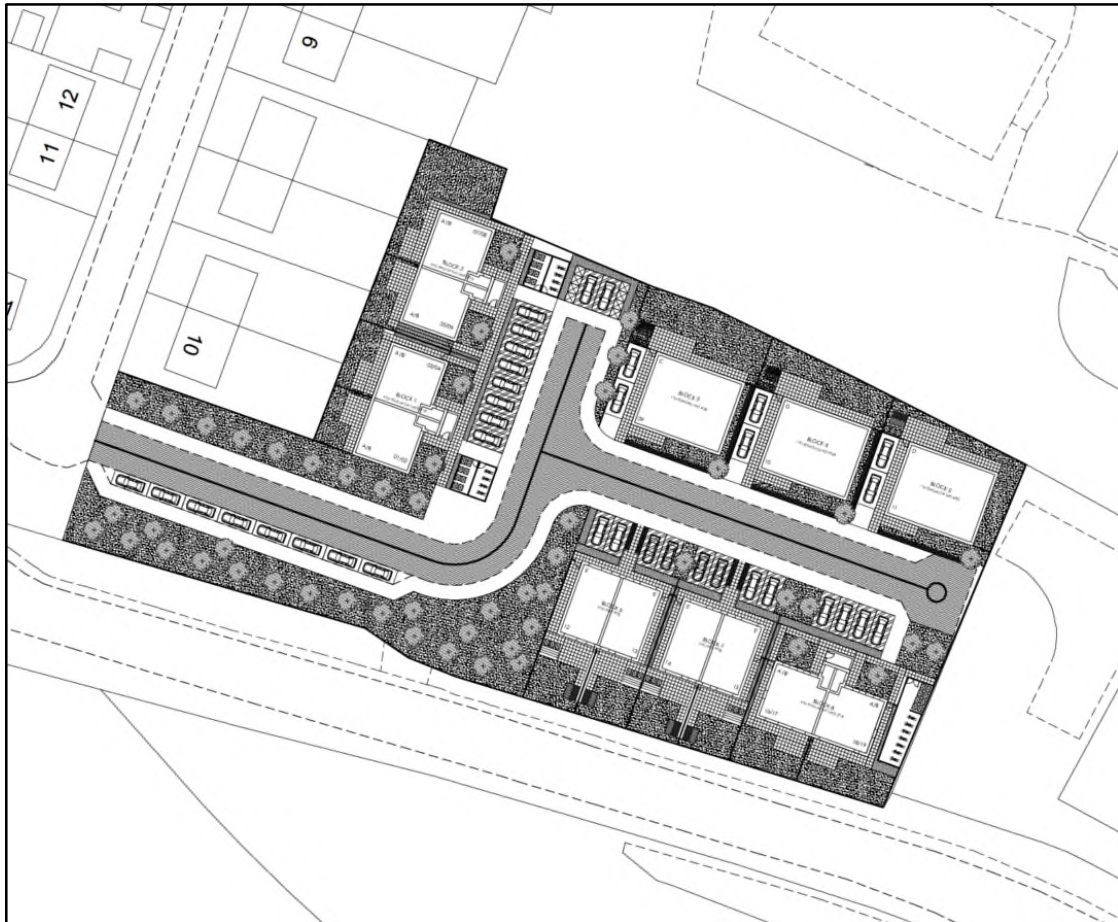


Figure 1.1 Proposed Site Layout

The development site is irregular in shape and centres on an approximate National Grid Reference of 297490, 204570. The site location can be seen in **Figure 1.2**.

Most of the site is currently undeveloped and covered with grass and scrub vegetation. The western area is about 3 m below the rest of the site and is covered by asphalt to the south and scrub vegetation to the north.

Site boundaries are defined by residential housing to the west, storage warehouse to the east, field land and recreation ground to the north and the Hirwaun road (A4059) to the south.

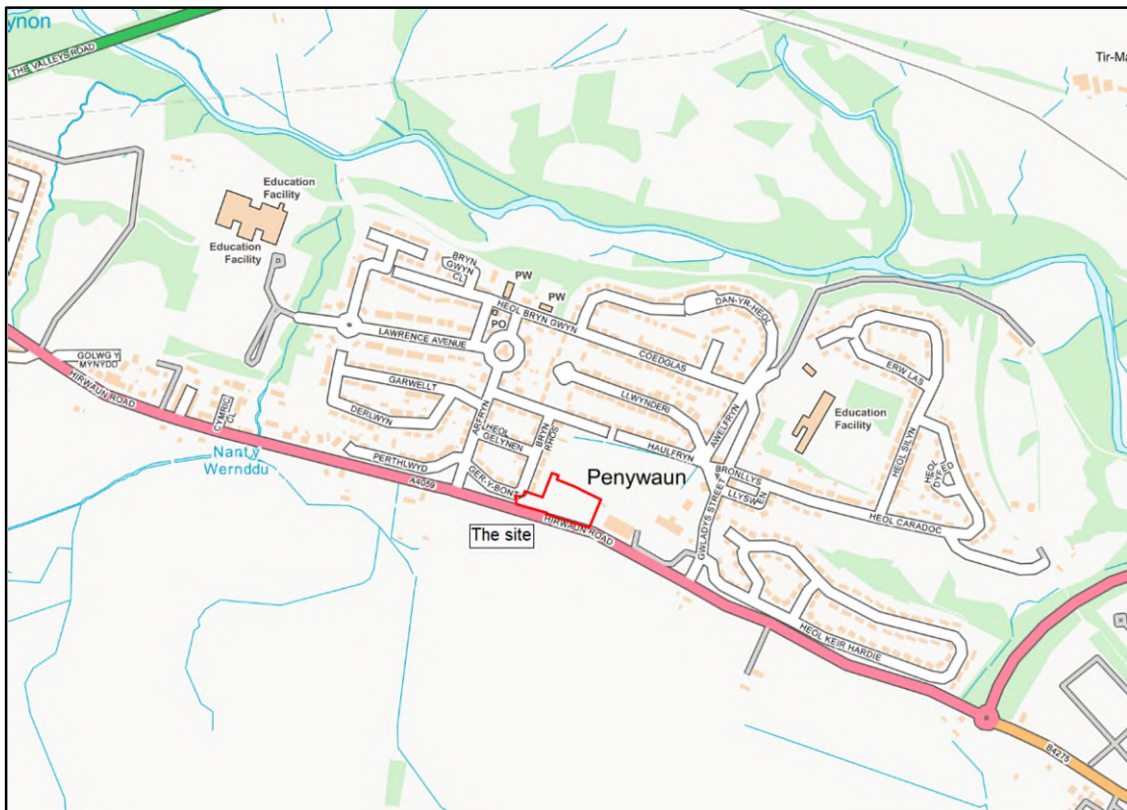


Figure 1.2 Site Location

TFW Group have previously undertaken a Geotechnical and Geoenvironmental site investigation dated February 2023 (reference 030223-17264-1). The report concluded:

" Due to the presence of the Horsway Adit beneath the site an intrusive investigation will be required to try and quantify the risk posed to the proposed development.

To try and determine the depth and orientation it is recommended that two rows of rotary boreholes are undertaken. These should employ a 'stitch drill' methodology with boreholes spaced approximately 1.00m apart and in a line perpendicular to the assumed path of the adit. The two rows should be spaced across the site to determine the orientation and change in depth.

The boreholes should be sunk to confirm a minimum of 30.00m of rock. Where made ground and/or superficial deposits are thick the borehole will need to extend to the corresponding depth."

TFW Group have been commissioned by the Client to undertake an intrusive mining risk assessment on the site.

The main objectives of the proof drill exercise was to:

- Determine the presence or otherwise of the adit beneath the development area.
- Provide recommendations for any necessary remedial measures required to render the site fit for development

In order to achieve the above objectives, TFW Group conducted an intrusive field investigation to confirm the shallow solid geology beneath the site.

1.1 Limitations and Exceptions of Investigation

The Intrusive Mining Risk Assessment was conducted, and this report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The report represents the findings and opinions of experienced geotechnical consultants. TFW Group does not provide legal advice and the advice of lawyers may be required.

The subsurface geological profiles are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths explored. The site investigation was limited by the following site constraints:

- Areas of dense vegetation
- Areas of uneven topography

SECTION 2 Field Investigation

2.1 Site Works

The Proof Drill Exercise was undertaken between the 2nd and 16th of May 2023 and comprised the drilling of 31 open-hole rotary probe holes.

The rotary boreholes were sunk using a SM-15 microdrilling rotary rig by Van Elle Limited. The probe holes were terminated at depths between 33.00m and 42.00m below the current ground level.

The location of the boreholes was targeted at the suspected location of the adit beneath the proposed development and was determined by TFW Group who also supervised the works.

The boreholes were logged by the lead driller based on an examination of the returns recovered during the drilling process and the behaviour of the drilling rig.

The borehole logs are presented in **Annex A** and the positions of the exploratory holes are presented in **Drawing 01**.

2.2 Ground Conditions

The ground conditions encountered by the rotary boreholes can in general be summarised as shown in **Table 2.1**. All quoted depths and stratum thicknesses are based upon the existing site topography.

Table 2.1 Summary of Typical Ground Conditions

| BH | Depth (m) | | Thickness (m) | Stratum | |
|-------------|-------------|---|---------------|-------------|--|
| A Boreholes | GL | - | 9.00/10.00 | 9.00/10.00 | MADE GROUND (Driller's Description) |
| | 9.00/10.00 | - | 18.30/19.00 | 8.60/10.00 | MUDSTONE/ SANDSTONE (Driller's Description) |
| | 18.30/19.00 | - | 20.00/20.60 | 1.10/2.00 | Dark MUDSTONE / Coal bands or coal traces (Drillers Description) |
| | 20.00/20.50 | - | 29.50/30.60 | 18.50/19.70 | MUDSTONE/ SANDSTONE (Drillers Description) |
| | 29.50/30.60 | | 32.00/32.40 | 1.40/2.40 | Soft drilling possible Fill (Drillers Description) Boreholes A12, A13, A14, A19 only. Or Soft broken drilling no flush return (Drillers Description) Boreholes A15, A16, A17, A18, A20 only. |
| | 32.00/32.40 | | 39.00/42.00 | | MUDSTONE/ SANDSTONE (Drillers Description) |
| B Boreholes | GL | - | 9.00/10.00 | 9.00/10.00 | MADE GROUND (Driller's Description) |
| | 9.00/10.00 | - | 20.50/21.00 | 10.50/12.00 | MUDSTONE/ SANDSTONE (Driller's Description) |
| | 20.50/21.00 | - | 22.90/26.00 | 1.00/1.50 | Dark MUDSTONE / Coal bands (Driller's description). |
| | 22.90/26.00 | | 28.00 | 4.00/5.10 | Soft broken ground (Drillers Description) Boreholes B1, B2, B3, B4, B5, B8 only. |
| | 28.00 | - | 33.00 | 10.70/18.10 | MUDSTONE / solid drill (Driller's description). |

The details logs can be found in **Annex A**.

2.2.1 Miscellaneous Ground Conditions

The following miscellaneous ground conditions were encountered during the drilling.
A2 from 9.50m to 11.00m: Weathered **SANDSTONE** (Driller's description).

A2 from 27.00m to 42.00m: Soft little resistance, 50% flush return. (Driller's description).

A2b from 28.00m to 31.00m: Weak MUDSTONE reduced flush return (Driller's description).

A7 from 31.00m to 32.50m: Soft strata MUDSTONE (Driller's description).

A8 from 31.00m to 32.50m: Soft strata / MUDSTONE. Reduction in flush return (Driller's description).

A9 from 31.00 to 32.00m: Soft strata. Full returns (Driller's description).

B6 from 31.00m to 34.00m: Fractured weak strata (Driller's description).

B8 from 28.00m to 33.00m: Solid drilling, no flush return (Driller's description).

2.3 Groundwater

No groundwater was recorded by the drillers.

SECTION 3 Assessment of the Risk from Past Shallow Coal Workings

3.1 Coal Seam Stratigraphy

The boreholes confirm both intact and non-intact sequences of mudstones/sandstones belonging to the **South Wales Lower Coal Measures Formation** to depths of 39.00m to 42.00m in the A boreholes and 33.00m in the B boreholes as described below:

- Made Ground
- Measures: Mudstone/Sandstone
- Measures: Mudstone / Coal bands or coal traces
- Measures: Mudstone/Sandstone
- **Very soft to soft drill / Broken ground / Poss fill / Soft Drill** (Horseway Level)
- Measures: Mudstone

3.2 Summary of Boreholes

A summary of the boreholes sunk beneath the site with particular reference to coal seams and old workings is presented in **Table 3.1** below and on the following page.

Table 3.1 Borehole Summary

| Location | Depth (m) | Feature | Thickness (m) |
|----------|-----------------------|--|---------------|
| A1 | 9.00 to 39.00 | No Features of Note | 30.00 |
| A2 | 18.50 to 20.50 | Dark Mudstone / Coal Bands | 2.00 |
| | 27.00 to 39.00 | Soft little resistance 50% flush | 12.00 |
| A2B | 18.50 to 20.50 | Dark Mudstone / Coal Bands | 2.00 |
| | 28.00 to 31.00 | Weak Mudstone reduced flush | 3.00 |
| A3 | 18.80 to 20.30 | Dark Mudstone / Coal Bands | 1.50 |
| A4 | 19.10 to 20.30 | Dark Mudstone / Coal Bands | 1.20 |
| A5 | 19.00 to 20.50 | Dark Mudstone / Coal Bands | 1.50 |
| A6 | 19.00 to 20.60 | Dark Mudstone / Coal Bands | 1.60 |
| | 31.00 to 35.00 | Soft Drill / Weak Strata | 4.00 |
| A7 | 18.50 to 20.30 | Dark Mudstone / Coal Bands | 1.80 |
| | 31.00 to 32.50 | Soft Strata Mudstone | 1.50 |
| A8 | 18.80 to 20.40 | Dark Mudstone / Coal Bands | 1.60 |
| | 31.00 to 32.50 | Soft Strata / Mudstone reduction in flush then full returns | 1.50 |
| A9 | 18.50 to 20.50 | Dark Mudstone / Coal Bands | 2.00 |
| | 31.00 to 32.00 | Soft strata full returns | 1.00 |
| A10 | 18.60 to 20.30 | Dark Mudstone / Coal Bands | 1.70 |
| A11 | 18.40 to 20.20 | Dark Mudstone / Coal Bands | 1.80 |
| A12 | 18.50 to 20.20 | Dark Mudstone / Coal Traces | 1.70 |
| | 30.50 to 32.00 | Soft drilling, reduction of flush return, possible fill | 1.50 |
| A13 | 18.30 to 20.00 | Dark Mudstone / Coal Traces | 1.70 |
| | 30.60 to 32.00 | Soft drilling, possible fill | 1.40 |
| A14 | 18.30 to 20.20 | Dark Mudstone / Coal Traces | 1.90 |
| | 30.40 to 32.10 | Soft drilling, possible fill, some reduction in flush | 1.70 |
| A15 | 30.00 to 32.40 | Soft broken drilling no returns | 1.40 |
| A16 | 18.70 to 20.00 | Dark Mudstone / Coal Traces | 1.30 |
| | 29.80 to 31.50 | Very soft drilling, no flush returns | 1.70 |
| A17 | 29.50 to 31.00 | Soft drilling, no returns | 1.50 |
| A18 | 18.90 to 20.00 | Dark Mudstone / Coal Bands | 1.10 |

| | | | |
|-----|-----------------------|---|-------------|
| | 29.80 to 32.00 | Broken soft drilling, no return | 2.20 |
| A19 | 19.00 to 20.30 | Dark Mudstone / Coal Traces | 1.30 |
| | 30.00 to 32.00 | Soft possible fill, poor return | 2.00 |
| A20 | 18.80 to 20.00 | Dark Mudstone / Coal Traces | 1.20 |
| | 29.50 to 31.50 | Soft broken drilling. No returns | 2.00 |
| B1 | 21.00 to 22.30 | Dark Mudstone / Coal Bands | 1.30 |
| | 23.00 to 28.00 | Broken ground / soft, no returns | 5.00 |
| B2 | 20.50 to 21.50 | Dark Mudstone / Coal Bands | 1.00 |
| | 23.00 to 28.00 | Broken ground / soft, no returns | 5.00 |
| B3 | 20.50 to 22.00 | Dark Mudstone / Coal Bands | 1.50 |
| | 23.30 to 28.00 | Broken ground / soft, no returns | 4.70 |
| B4 | 20.50 to 21.70 | Dark Mudstone / Coal Traces | 1.20 |
| | 22.90 to 28.00 | Broken ground / soft, no returns | 5.10 |
| B5 | 21.00 to 22.10 | Dark Mudstone / Coal Traces | 1.10 |
| | 26.00 to 28.00 | Broken ground / soft, no returns | 2.00 |
| B6 | 21.00 to 22.30 | Dark Mudstone / Coal Bands | 1.30 |
| | 31.00 to 34.00 | Fractured Weak Strata | 3.00 |
| B7 | 20.90 to 22.30 | Dark Mudstone / Coal Bands | 1.40 |
| B8 | 23.00 to 28.00 | Tight Broken Soft, no returns | 5.00 |
| B9 | 20.90 to 22.00 | Dark Mudstone / Coal Bands | 1.10 |
| B10 | 20.70 to 22.00 | Dark Mudstone / Coal Bands | 1.30 |

Several of the boreholes encountered soft drilling / broken ground of varying thickness. During the site investigation, the drillers explained that the soft drilling / broken ground was seen as very short sections where the drill would 'peck' or 'clack' interspersed with possible open voids where the head would fall with little to no resistance.

Where soft drill / broken ground was encountered there was a corresponding loss of flush while drilling. However, when fractured strata was encountered there was not a loss of flush. This is points towards the soft drill / broken ground being the back filled adit.

Cross sections of the two lines of boreholes have been produced using the Holebase logging software. It can be seen in Drawing 02 (Borehole Line A) and Drawing 03 (Borehole Line B) that there is a feature within the rock that deviates from the expected ground conditions. In Borehole Line A this is a fairly wide but thin feature, in Borehole Line B this is a narrower feature but is thicker. This may be evidence that the feature has partially collapsed.

The drilling shows that the floor of the adit is at an approximate depth of 32m in Borehole Line A and in Borehole Line B it is at 28m. This would suggest that roadway is rising from the location of the adit mouth to mine shaft which it is seen to be connected to on the abandonment plans.

Due to the presence of shallow workings, there is risk to the proposed development and this is considered in the following sections.

3.3 Potential Hazards from Shallow Workings

A paper published in 'Land Subsidence (Proceedings of the Fourth International Symposium on Land Subsidence, May 1991 – IAHS Publ. no. 200,1991) by Statham *et al*, titled 'Subsidence Due to Abandoned Mining in the South Wales Coalfield, U.K: Causes, Mechanisms and Environmental Risk Assessment' was consulted.

Statham *et al* have shown that in the South Wales Coalfield the upper limit of crown hole migration through rock is generally 8 to 12 times the void height.

Figure 3 of this paper (reproduced below) presents a histogram of H/T (rock head over void height). From this histogram it can be extrapolated that over 95% of the incidents of crown hole migration occur where the H/T ratio is less than 10 (i.e 1m void for 10m overlying rockhead cover. Over 75% occur where the H/T ratio is less than 2.

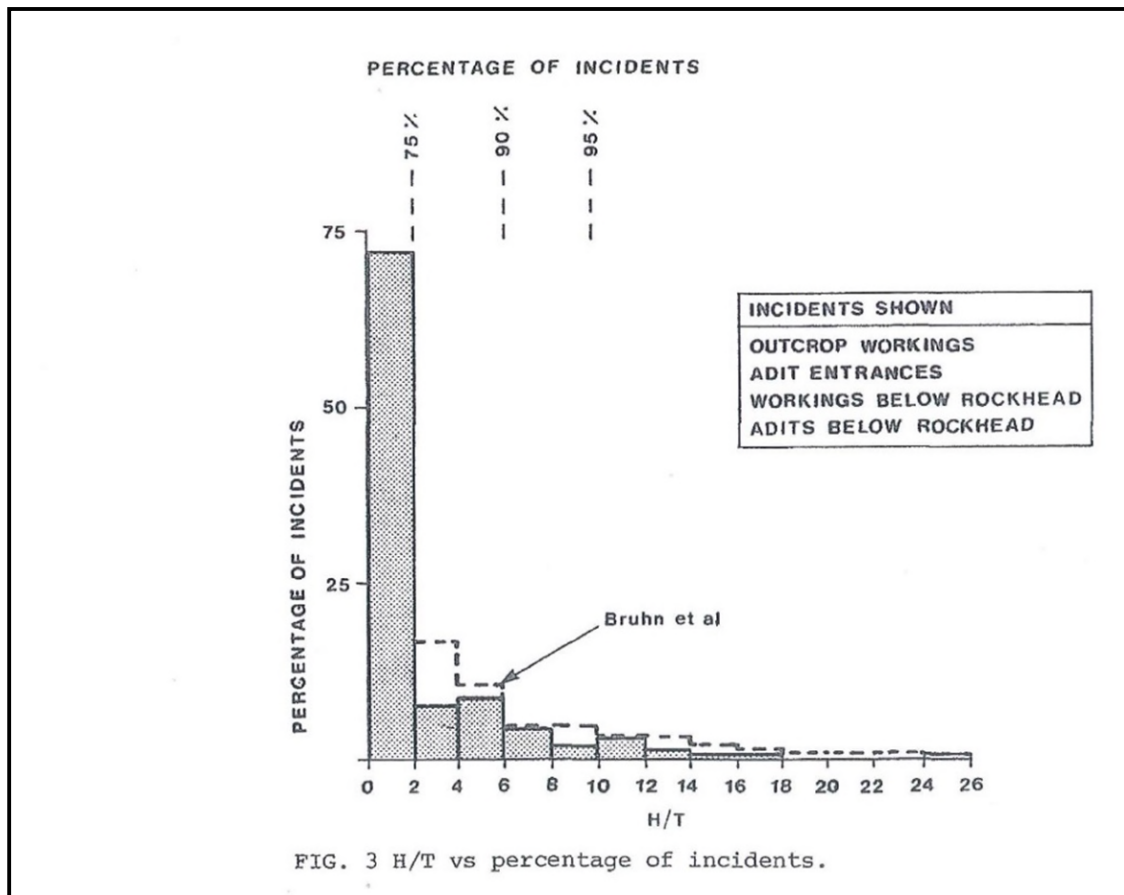


Figure 3.1 Figure 3 Exert from Statham *et al*

Table 3.2 compares a H/T ratio of ten with actual rock head cover for both normal workings and roadways. Values are shaded red where the 10:1 ratio criterion is not satisfied. Where a void is present over soft drill the thickness of both features has been used for analysis.

Table 3.2 Summary of Rock Head Cover

| Location | Depth to Rock Head (m below ground level) | Thickness of Mining Feature (m) | Estimated Rock Head Cover Required Based on H/T Ration of ten and feature thickness (m) | Actual Rock Head Cover (m) |
|----------|---|---------------------------------|---|----------------------------|
| A1 | 9.00 | - | Intact Sequence | - |
| A2 | 9.50 | - | Intact Sequence | - |
| A2b | 9.50 | - | Intact Sequence | - |
| A3 | 9.50 | - | Intact Sequence | - |
| A4 | 10.00 | - | Intact Sequence | - |
| A5 | 11 | - | Intact Sequence | - |
| A6 | 9.70 | - | Intact Sequence | - |
| A7 | 9.80 | - | Intact Sequence | - |
| A8 | 10.00 | - | Intact Sequence | - |

| | | | | |
|-----|-------|------|--------------------|-------|
| A9 | 10.00 | - | Intact Sequence | - |
| A10 | 10.00 | - | Intact Sequence | - |
| A11 | 10.00 | - | Intact Sequence | - |
| A12 | 9.80 | 1.50 | 15.00 (Soft drill) | 20.70 |
| A13 | 9.50 | 1.40 | 14.00 (Soft drill) | 21.10 |
| A14 | 9.50 | 1.70 | 17.00 (Soft drill) | 20.90 |
| A15 | 9.50 | 1.40 | 14.00 (Soft drill) | 20.50 |
| A16 | 9.50 | 1.70 | 17.00 (Soft drill) | 20.30 |
| A17 | 9.00 | 1.50 | 15.00 (Soft drill) | 20.50 |
| A18 | 9.00 | 2.20 | 22.00 (Soft drill) | 20.80 |
| A19 | 9.00 | 2.00 | 20.00 (Soft drill) | 21.00 |
| A20 | 9.00 | 2.00 | 20.00 (Soft drill) | 20.50 |
| B1 | 9.00 | 5.00 | 50.00 (Soft drill) | 14.00 |
| B2 | 9.50 | 5.00 | 50.00 (Soft drill) | 13.50 |
| B3 | 9.50 | 4.70 | 47.00 (Soft drill) | 18.80 |
| B4 | 10.00 | 5.10 | 51.00 (Soft drill) | 12.90 |
| B5 | 9.50 | 2.00 | 20.00 (Soft drill) | 16.50 |
| B6 | 9.50 | - | Intact Sequence | - |
| B7 | 9.50 | - | Intact Sequence | - |
| B8 | 9.50 | 5.00 | 50.00 (Soft drill) | 13.50 |
| B9 | 9.50 | - | Intact Sequence | - |
| B10 | 9.40 | - | Intact Sequence | - |

Notes:

| | |
|--|--|
| | Borehole with sufficient rock head cover or where rock sequence was intact |
| | Borehole with insufficient rock head cover over backfilled workings / soft drill |
| | Borehole with insufficient rock head cover and open voids / backfilled workings below void |

The site investigation boreholes have found the adit / roadway crossing the site with insufficient rock head cover over soft drill and backfilled workings. The 10:1 ratio for rock head to void has not been achieved and the risk to the proposed development is considered to be high. It is therefore necessary for the workings to be stabilised by drilling and grouting methods.

Drawing 04 shows the location of the feature and it's anticipated direction across the site in relation to the proposed development.

SECTION 4 Proposed Remedial Measures

4.1 Drilling and Grouting

As previously stated, the rotary boreholes have confirmed that there is a shallow backfilled roadway associated with the adit within the bedrock, and there is insufficient rockhead cover to protect from a collapse of this feature. It is also possible that the feature seen in Borehole Line B has already partially collapsed.

Adits were used as access to mines but also for drainage and ventilation of underground mines. Prior to treatment works it is recommended that groundwater monitoring wells are installed in the feature to determine if it is an active conduit for water. If significant water is encountered consideration may need to be given to an alternative method of treatment.

Ground stabilisation by drilling and grouting must be carried out prior to development commencing. This should be undertaken in accordance with Chapter 6 'Consolidation of Shallow Abandoned Mine Workings' of CIRIA C758D: 2019 'Abandoned Mine Workings Manual'.

Grout is pumped into the working, acting 'to replace or maintain the sub-surface support lost by excavation, and to restrict void migration so that any subsequent development does not experience foundation collapse or major subsidence'.

To gain adequate coverage of the area to be treated a series of rotary boreholes are sunk in a grid formation through the workings.

A closely spaced line of grout holes should be established at either end of the feature, as close to the site boundary as possible, using a spacing of 1.00m. For the internal grid between the two end lines, a spacing of 3.00m is utilised. A sacrificial plastic tube is inserted in each hole to ensure it remains open throughout the grouting procedure. Alternatively, a reusable steel casing can be used. The grid should extend beyond the assumed route of the roadway to ensure it is properly stabilised.

Grout typically comprises a 10:1 mixture of pulverised fuel ash (pfa) to Ordinary Portland cement, batch mixed via a paddle mixer.

Given the backfilled nature of the workings grout should be pumped into the borehole under pressure to ensure adequate treatment. Initially the perimeter / end holes are filled until grout is present at the surface. In this way a grout curtain is established to prevent grout migration to areas outside the stabilisation zone. Grouting is also started at the down dip end of the feature which in the case of this roadway is the northern end.

Where particularly high grout intakes are required the grid size may be reduced with additional intersecting boreholes. Once the grout curtain has been established the internal holes are filled.

Drilling and grouting would reduce the potential risks to tolerable levels.

Once the area has successfully been stabilised reinforced concrete strip foundation or a reinforced concrete raft type foundation/floor slab solution can be constructed within competent shallow ground. The foundations should be capable of spanning a residual crown hole of 1.5m with a cantilever effect on corners of 1.0m. These foundation recommendations would need to be confirmed by a suitable site investigation to determine the strength of the in-situ soils and deeper foundations may be required.

ANNEX A
Rotary Borehole Logs



Tel: 02920 735354
 info@terrafirmawales.co.uk
 www.terrafirmawales.co.uk

Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A1

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297539E - 204569N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 9 |
| | | | | | | | | | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 19.00 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A1

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297539E - 204569N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | 39.00 | | | | End of Borehole at 39.000m | 39 |
| | | | | | | | | | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A2

Sheet 1 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297538E - 204570N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.50 | | | | MADE GROUND (Driller's description). | 9 |
| | | | | | | | | Weathered SANDSTONE (Driller's description). | 10 |
| | | | | 11.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.50 | | | | Dark MUDSTONE / SANDSTONE (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. From 27m to 42m possibly bent towards the previous BH. No gas was recorded.



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Borehole Log

Borehole No.

A2

Sheet 2 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297538E - 204570N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.50 | | | | Dark MUDSTONE / SANDSTONE (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | 27.00 | | | | Soft little resistance 50% Flush (Driller's description). | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | 39.00 | | | | Solid 50% flush (Driller's description). | 39 |
| | | | | | | | | | 40 |

Remarks: 10m casing. From 27m to 42m possibly bent towards the previous BH. No gas was recorded.



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Borehole Log

Borehole No.

A2

Sheet 3 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297538E - 204570N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 42.00 | | | | Solid 50% flush (Driller's description). | 41 |
| | | | | | | | | End of Borehole at 42.000m | 42 |
| | | | | | | | | | 43 |
| | | | | | | | | | 44 |
| | | | | | | | | | 45 |
| | | | | | | | | | 46 |
| | | | | | | | | | 47 |
| | | | | | | | | | 48 |
| | | | | | | | | | 49 |
| | | | | | | | | | 50 |
| | | | | | | | | | 51 |
| | | | | | | | | | 52 |
| | | | | | | | | | 53 |
| | | | | | | | | | 54 |
| | | | | | | | | | 55 |
| | | | | | | | | | 56 |
| | | | | | | | | | 57 |
| | | | | | | | | | 58 |
| | | | | | | | | | 59 |
| | | | | | | | | | 60 |

Remarks: 10m casing. From 27m to 42m possibly bent towards the previous BH. No gas was recorded.



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Borehole Log

Borehole No.

A2b

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297537E - 204569N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 11/05/2023 - 11/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|--|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 9 |
| | | | | 9.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 11 12 13 14 15 16 17 |
| | | | | 18.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 18 19 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A2b

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297537E - 204569N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 11/05/2023 - 11/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | 28.00 | | | | Weak MUDSTONE reduced flush return (Driller's description). | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 31.00 | | | | MUDSTONE / SANDSTONE full flush return (Driller's description). | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A3

Sheet 1 of 2

| | | | |
|---|--------------------------|---------------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297537E - 204570N | Hole Type RO |
| Location: Hirwaun Road, Penywaun | | Level: | Scale 1:100 |
| Client: Newydd Housing Association | | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.50 | | | | | 9 |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.80 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A3

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297537E - 204570N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A4

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297536E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|---|---|--|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 10.00 | | |  | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 9 |
| | | | | 19.10 | | |  | MuDSTONE / SANDSTONE (Driller's description). | 10 11 12 13 14 15 16 17 18 |
| | | | | | | |  | Dark MUDSTONE / Coal bands (Driller's description). | 19 20 |

Remarks: 12m casing. No gas was recorded.



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Borehole Log

Borehole No.

A4

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297536E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 03/05/2023 - 03/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 12m casing. No gas was recorded.



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Borehole Log

Borehole No.

A5

Sheet 1 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297535E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|---|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 9 10 |
| | | | | 11.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 11 12 13 14 15 16 17 18 |
| | | | | 19.00 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 20 |

Remarks: 12m casing. No gas was recorded.



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Borehole Log

Borehole No.

A5

Sheet 2 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297535E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | | | | | | 40 |

Remarks: 12m casing. No gas was recorded.



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Borehole Log

Borehole No.

A5

Sheet 3 of 3

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297535E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 41.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | |
| | | | | | | | | End of Borehole at 41.000m | 41 |
| | | | | | | | | | 42 |
| | | | | | | | | | 43 |
| | | | | | | | | | 44 |
| | | | | | | | | | 45 |
| | | | | | | | | | 46 |
| | | | | | | | | | 47 |
| | | | | | | | | | 48 |
| | | | | | | | | | 49 |
| | | | | | | | | | 50 |
| | | | | | | | | | 51 |
| | | | | | | | | | 52 |
| | | | | | | | | | 53 |
| | | | | | | | | | 54 |
| | | | | | | | | | 55 |
| | | | | | | | | | 56 |
| | | | | | | | | | 57 |
| | | | | | | | | | 58 |
| | | | | | | | | | 59 |
| | | | | | | | | | 60 |

Remarks: 12m casing. No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A6

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297534E - 204571N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 9.70 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 19.00 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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Sheet 2 of 2

| | | | |
|---|--------------------------|---------------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297534E - 204571N | Hole Type RO |
| Location: Hirwaun Road, Penywaun | | Level: | Scale 1:100 |
| Client: Newydd Housing Association | | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.60 | | | | Dark MUDSTONE / Coal bands (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 31.00 | | | | MUDSTONE Soft drilling / weak strata. Some reduction in flush return (Driller's description). | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | 35.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A7

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297533E - 204572N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 9.80 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297533E - 204572N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 31.00 | | | | Soft strata MUDSTONE (Driller's description). | 31 |
| | | | | | | | | | 32 |
| | | | | 32.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297532E - 204572N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 10.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.60 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297532E - 204572N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 04/05/2023 - 04/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.40 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 31.00 | | | | Soft strata / MUDSTONE. Reduction in flush return (Driller's description). | 31 |
| | | | | | | | | | 32 |
| | | | | 32.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|------------------------|-------------------|----------------------------|--------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297531E - 204573N | Hole Type RO |
|------------------------|-------------------|----------------------------|--------------|

| | | |
|----------------------------------|--------|-------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|----------------------------------|--------|-------------|

| | | |
|------------------------------------|--------------------------------|--------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|------------------------------------|--------------------------------|--------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 10.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297531E - 204573N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.50 | | | | Dark MUDSTONE / Coal bands (Driller's description). | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 31.00 | | | | Soft strata. Full flush return (Driller's description). | 31 |
| | | | | 32.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297530E - 204573N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 10.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.60 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297530E - 204573N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297530E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 10.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.40 | | | | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297530E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 05/05/2023 - 05/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.20 | | | | Dark MUDSTONE / Coal bands (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297529E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 9.80 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.50 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A12

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297529E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.20 | | | | Dark MUDSTONE / Coal trace (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 30.50 | | | | Soft drilling, reduction of flush, poss fill (Driller's description). | 31 |
| | | | | 32.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A13

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297528E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|--|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 9 |
| | | | | 9.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 11 12 13 14 15 16 17 |
| | | | | 18.30 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 18 19 |
| | | | | 20.00 | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A13

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297528E - 204574N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | |
| | | | | | | | | | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 30.60 | | | | | |
| | | | | | | | | Soft drilling, poss fill (Driller's description). | |
| | | | | | | | | | 31 |
| | | | | | | | | | 32 |
| | | | | 32.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | | |
| | | | | | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A14

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|------------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297527E - 204575N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|------------------------|

| | | |
|---|--------|-----------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|-----------------------|

| | | |
|---|---------------------------------------|------------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|------------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|--|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 9 |
| | | | | 9.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 11 12 13 14 15 16 17 |
| | | | | 18.30 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 18 19 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A14

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297527E - 204575N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 09/05/2023 - 09/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.20 | | | | Dark MUDSTONE / Coal trace (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | | | | | | 30 |
| | | | | 30.40 | | | | Soft drilling, poss fill, some reduction in flush (Driller's description). | 31 |
| | | | | 32.10 | | | | MUDSTONE / SANDSTONE (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A15

Sheet 1 of 2

| | | | |
|---|--------------------------|---------------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297526E - 204575N | Hole Type RO |
| Location: Hirwaun Road, Penywaun | | Level: | Scale 1:100 |
| Client: Newydd Housing Association | | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | | | | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|--|--|----|
| | Depth (m) | Type | Results | | | | | | | | | |
| | | | | 9.50 | | | | MADE GROUND (Driller's description). | 1 | | | |
| | | | | | | | | | | | | 2 |
| | | | | | | | | | | | | 3 |
| | | | | | | | | | | | | 4 |
| | | | | | | | | | | | | 5 |
| | | | | | | | | | | | | 6 |
| | | | | | | | | | | | | 7 |
| | | | | | | | | | | | | 8 |
| | | | | | | | | | | | | 9 |
| | | | | 19.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 | | | |
| | | | | | | | | | | | | 11 |
| | | | | | | | | | | | | 12 |
| | | | | | | | | | | | | 13 |
| | | | | | | | | | | | | 14 |
| | | | | | | | | | | | | 15 |
| | | | | | | | | | | | | 16 |
| | | | | | | | | | | | | 17 |
| | | | | | | | | | | | | 18 |
| | | | | | | | | | | | | 19 |
| | | | | 19.00 | | | | Dark MUDSTONE (Driller's description). | 19 | | | |
| | | | | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A15

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297526E - 204575N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|--|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 22 23 24 25 26 27 28 29 |
| | | | | 30.00 | | | | Soft broken drilling. No flush return (Driller's description). | 30 31 32 |
| | | | | 32.40 | | | | Solid drilling. No flush return (Driller's description). | 33 34 35 36 37 38 39 |
| | | | | 40.00 | | | | End of Borehole at 40.000m | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A16

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297525E - 204576N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | | | | | | 9 |
| | | | | 9.50 | | | | MUDSTONE / SANDSTONE (Driller's description). | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.70 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 19 |
| | | | | | | | | | 20 |
| | | | | 20.00 | | | | | |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297525E - 204576N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | 29.80 | | | | | 30 |
| | | | | | | | | Very soft drilling, no flush return (Driller's description). | 31 |
| | | | | 31.50 | | | | | 32 |
| | | | | | | | | Solid drilling, no flush return (Driller's description). | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 40.00 | | | | | 40 |
| | | | | | | | | End of Borehole at 40.000m | |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297524E - 204576N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 9 |
| | | | | | | | | | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 19.00 | | | | Dark MUDSTONE (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

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| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297524E - 204576N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.20 | | | | Dark MUDSTONE (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | 29.50 | | | | Soft drilling, no return (Driller's description). | 30 |
| | | | | 31.00 | | | | Solid drilling (Driller's description). | 31 |
| | | | | | | | | | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | 39.00 | | | | End of Borehole at 39.000m | 39 |
| | | | | | | | | | 40 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

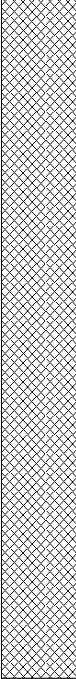


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Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297523E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|---|---|---|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | |  | MADE GROUND (Driller's description). | 1 2 3 4 5 6 7 8 |
| | | | | 9.00 | | |  | MUDSTONE / SANDSTONE (Driller's description). | 9 10 11 12 13 14 15 16 17 18 |
| | | | | 18.90 | | |  | Dark MUDSTONE / Coal bands (Driller's description). | 19 |
| | | | | 20.00 | | | | | 20 |

Remarks: 10m casing. No gas was recorded.



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Borehole Log

Borehole No.

A18

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297523E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | |
| | | | | | | | | | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | 29.80 | | | | Broken soft drilling, no return (Driller's description). | 30 |
| | | | | | | | | | 31 |
| | | | | 32.00 | | | | Solid drilling (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | 39.00 | | | | End of Borehole at 39.000m | 39 |
| | | | | | | | | | 40 |

Remarks: 10m casing. No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A19

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297522E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 9 |
| | | | | | | | | | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 19.00 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 19 |
| | | | | | | | | | 20 |

Remarks: 10m casing No gas was recorded.



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Borehole Log

Borehole No.

A19

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297522E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | 20.30 | | | | Dark MUDSTONE / Coal trace (Driller's description). MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | 30.00 | | | | Soft poss fill, poor return (Driller's description). | 30 |
| | | | | | | | | | 31 |
| | | | | 32.00 | | | | MUDSTONE / SANDSTONE flush back (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | 39.00 | | | | End of Borehole at 39.000m | 39 |
| | | | | | | | | | 40 |

Remarks: 10m casing No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A20

Sheet 1 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297521E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|---|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MADE GROUND (Driller's description). | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |
| | | | | | | | | | 6 |
| | | | | | | | | | 7 |
| | | | | | | | | | 8 |
| | | | | 9.00 | | | | MUDSTONE / SANDSTONE (Driller's description). | 9 |
| | | | | | | | | | 10 |
| | | | | | | | | | 11 |
| | | | | | | | | | 12 |
| | | | | | | | | | 13 |
| | | | | | | | | | 14 |
| | | | | | | | | | 15 |
| | | | | | | | | | 16 |
| | | | | | | | | | 17 |
| | | | | | | | | | 18 |
| | | | | 18.80 | | | | Dark MUDSTONE / Coal trace (Driller's description). | 19 |
| | | | | | | | | | 20 |
| | | | | 20.00 | | | | | |

Remarks: 10m casing. No gas was recorded.



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Geotechnical & Geoenvironmental Specialists

Borehole Log

Borehole No.

A20

Sheet 2 of 2

| | | | |
|-------------------------------|--------------------------|-----------------------------------|---------------------|
| Project Name: Penywaun | Project No: 17264 | Co-ords: 297521E - 204577N | Hole Type RO |
|-------------------------------|--------------------------|-----------------------------------|---------------------|

| | | |
|---|--------|--------------------|
| Location: Hirwaun Road, Penywaun | Level: | Scale 1:100 |
|---|--------|--------------------|

| | | |
|---|---------------------------------------|---------------------|
| Client: Newydd Housing Association | Dates: 10/05/2023 - 10/05/2023 | Logged By TM |
|---|---------------------------------------|---------------------|

| Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Well | Legend | Stratum Description | |
|---------------|----------------------------|------|---------|-----------|-----------|------|--------|--|----|
| | Depth (m) | Type | Results | | | | | | |
| | | | | | | | | MUDSTONE / SANDSTONE (Driller's description). | 21 |
| | | | | | | | | | 22 |
| | | | | | | | | | 23 |
| | | | | | | | | | 24 |
| | | | | | | | | | 25 |
| | | | | | | | | | 26 |
| | | | | | | | | | 27 |
| | | | | | | | | | 28 |
| | | | | | | | | | 29 |
| | | | | 29.50 | | | | Soft broken drilling. No flush return (Driller's description). | 30 |
| | | | | | | | | | 31 |
| | | | | 31.50 | | | | Solid drilling (Driller's description). | 32 |
| | | | | | | | | | 33 |
| | | | | | | | | | 34 |
| | | | | | | | | | 35 |
| | | | | | | | | | 36 |
| | | | | | | | | | 37 |
| | | | | | | | | | 38 |
| | | | | | | | | | 39 |
| | | | | 39.00 | | | | End of Borehole at 39.000m | 40 |

Remarks: 10m casing. No gas was recorded.

DRAWINGS




Job Number: 17264

Job Title:
Penywaun

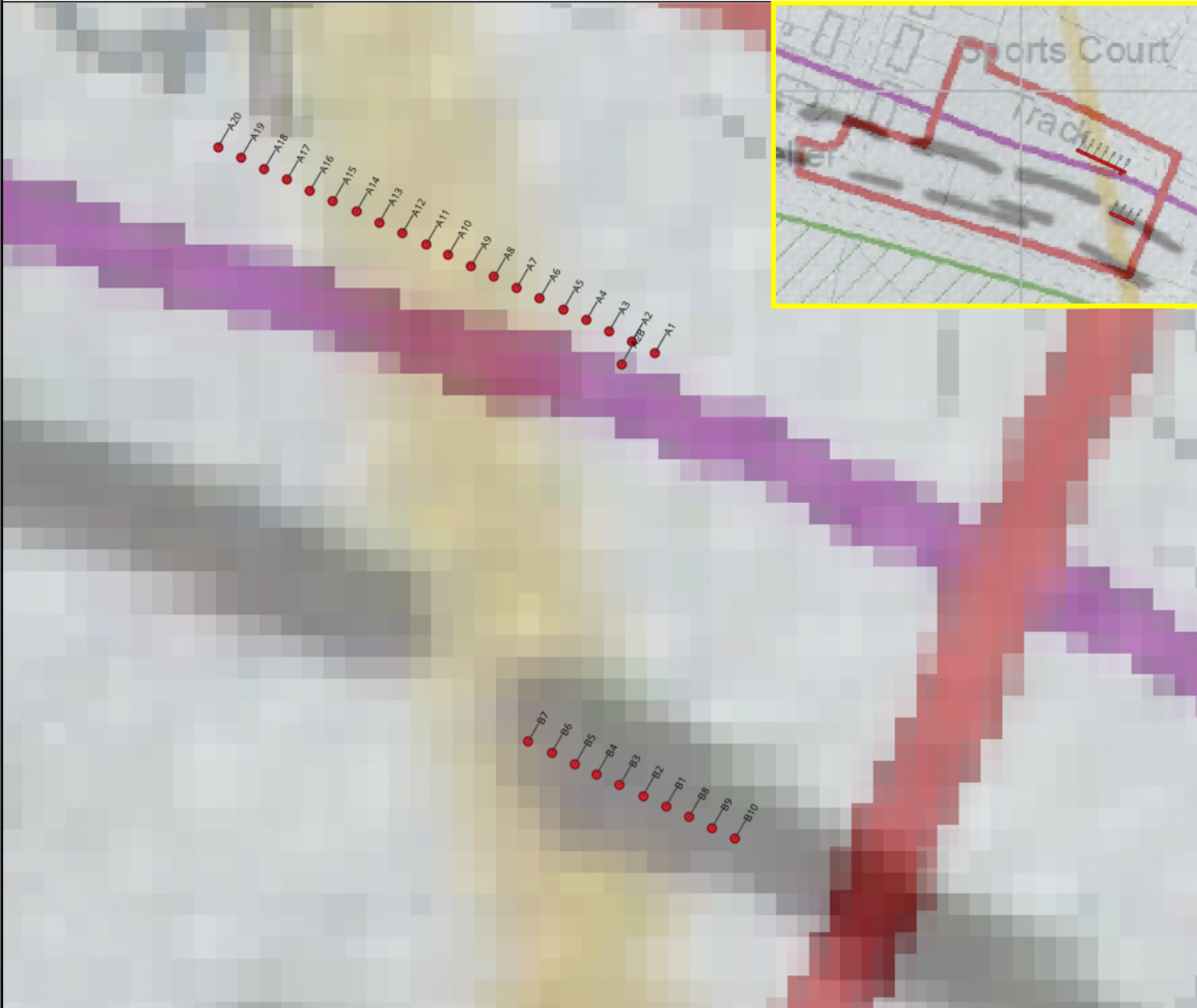
Drawing Title:
Exploratory Hole Layout

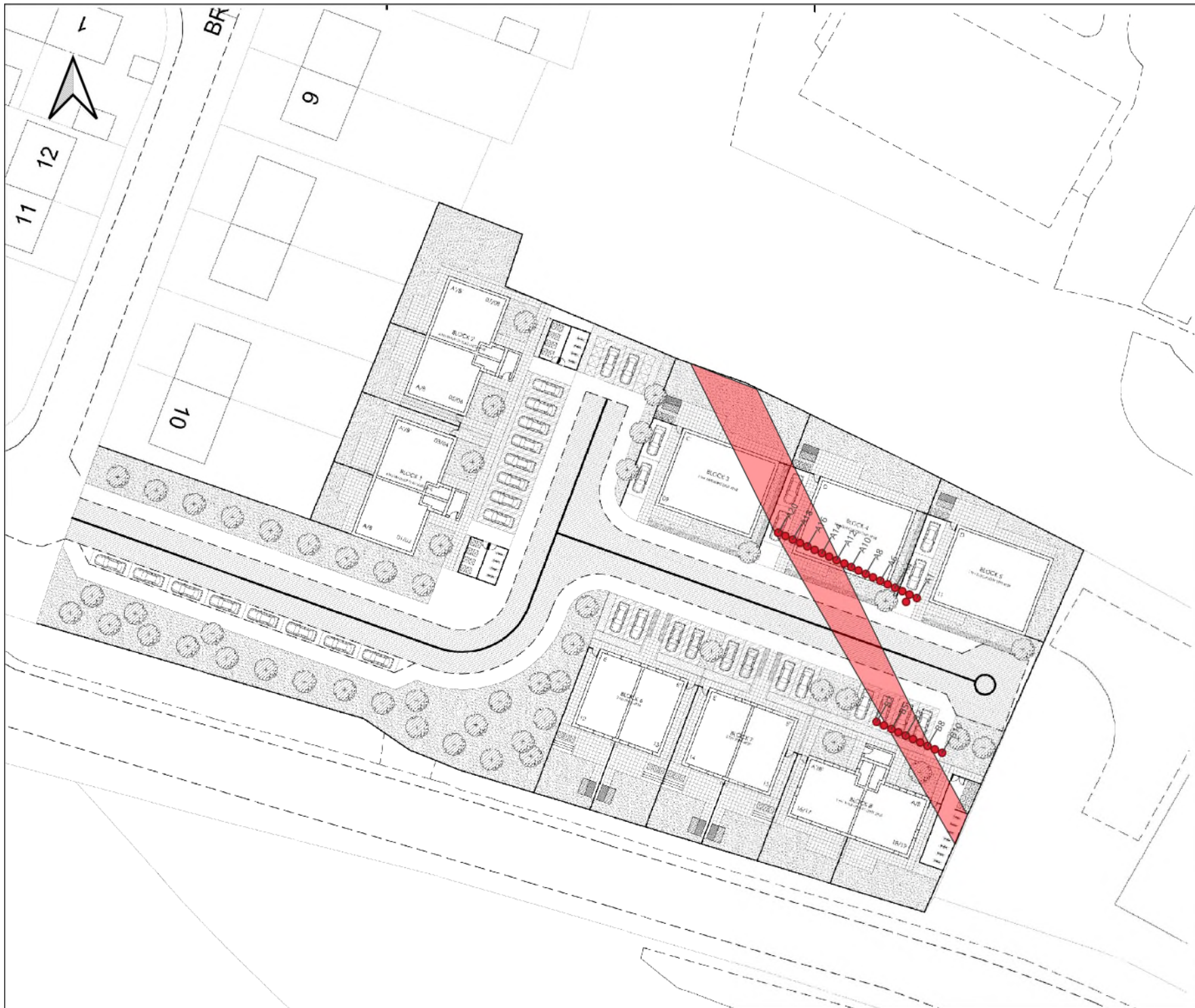
Drawing Number:
01

Scale:
Not To Scale

Legend:
 Rotary Open-Hole Borehole Location

North





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SCALE: 1:1500 (approx. @A3)

PROJECT
Penywaun, Hirwaun

DRAWING 04:
Approximate Adit Route
(Highlighted Red)

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