

14283/LP

1<sup>st</sup> October 2024

Mr Andrew Hall  
Daisy Barn  
Eglwys Nunnydd  
Port Talbot  
SA13 2PS

***For the attention of Mr Andrew Hall***

## **7 Ten Acre Wood, Margam - Rotary Borehole Mining Investigation**

We have now completed the rotary borehole mining investigation at the above site and can report as follows.

This report (including all appendices to it and any subsequent addendums or correspondence) has been prepared for the sole benefit, use and information of Mr Andrew Hall and no third party is entitled or permitted to rely upon it. This report may not be used, reproduced, or circulated (in whole or part) for any purpose without the written consent of Intégral Géotechnique (Wales) Limited. Intégral Géotechnique (Wales) Limited shall not be liable to any third party who does not have such express written permission to rely on the report for any losses they may suffer.

### ***Background and Scope of Works***

Mr Andrew Hall is proposing the construction of a new residential dwelling at 7 Ten Acre Wood in Margam. The site occupies an area of approximately 0.2 hectares and is located at a National Grid Reference of 279750, 186270, see Figure 1.

The site is situated on ground which gently rises to the east from an approximate minimum elevation of 23m AOD in the western area of the site to an approximate maximum elevation of 28m AOD within the eastern corner.

The site is occupied by an existing detached residential dwelling. Pedestrian access is gained from a road to the southeast. There is vehicular access and parking to the north of the existing dwelling. The remainder of the site is formed by mature gardens including lawns and planting, see Figure 2.

The development proposals comprise the demolition of the existing residential dwelling followed by the construction of a new residential dwelling. The development will also include an associated driveway and parking areas.

A previous desk-based Coal Mining Risk Assessment was completed by Intégral Géotechnique (Wales) Limited with the findings and recommendations presented within Coal Mining Risk Assessment Report (CMRA) Ref: 14283/LP/23/CMRA, dated November 2023. The report cautioned the potential for unrecorded shallow mine workings beneath the site and recommended that a series of rotary boreholes be drilled to define the potential level of risk to the proposed development using site-specific data.

Intégral Géotechnique (Wales) Limited were instructed by Mr Andrew Hall to drill a series of rotary boreholes across the site in order to further assess the risks to the proposed development from:

- Potential shallow unrecorded underground mine workings beneath the site
- Potential mine gas emissions

Please note that this report should be read in conjunction with the previous desk-based Coal Mining Risk Assessment (CMRA) Report referenced above.

### ***Fieldworks***

A total of 4 No. rotary boreholes (referenced BH01 to BH04) were drilled across the site during September 2024.

The rotary boreholes were drilled using a Fraste PLG rotary drilling rig, operated by a two-man crew, down to depths of typically 35.0m bgl, but down to 36.5m within borehole BH04.

The boreholes were drilled using rotary open-hole methods and gases were monitored during the drilling of the boreholes.

The fieldworks were supervised by a qualified Geotechnical Engineer from Intégral Géotechnique (Wales) Limited.

The rotary borehole logs are presented in Appendix A and the approximate locations are shown in Figure 2.

### ***Ground Conditions***

The ground conditions encountered within the rotary boreholes comprised thick superficial soils overlying mudstone/sandstone bedrock with occasional thin intact coal seams.

The superficial soils, comprising sands and gravel, extended to depths of between approximately 15.0m and 15.5m depth. The bedrock, comprising bands of mudstone and sandstone, was encountered directly beneath the superficial soils.

Thin intact coal seams were occasionally encountered within the boreholes. A summary of the encountered coal seams is presented below in Table 1.

| <b>Table 1: Encountered Coal Seams</b> |                                      |                              |                                 |                               |
|----------------------------------------|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Borehole Reference                     | Approximate Depth to Bedrock (m bgl) | Depth to Top of Coal (m bgl) | Depth to Bottom of Coal (m bgl) | Coal Thickness (m)            |
| BH01                                   | 15.4                                 | 27.0                         | 27.1                            | 0.1                           |
|                                        |                                      | 32.4                         | 32.8                            | 0.4                           |
| BH02                                   | 15.5                                 | 30.1                         | 30.4                            | 0.3                           |
| BH03                                   | 15.0                                 | 30.1                         | 30.2                            | 0.1                           |
| BH04                                   | 15.0                                 | 22.1                         | 22.4                            | 0.3                           |
|                                        |                                      | 28.0                         | 28.6                            | 0.6 (coal and mudstone bands) |
|                                        |                                      | 35.0                         | 35.4                            | 0.4                           |

Where present, the coal seams were encountered at variable depths ranging between approximately 22.1m bgl and 35.0m bgl with one or more seams encountered within each borehole.

It is important to note that although intact coal seams have been encountered beneath the site, no evidence of potential underground mine workings was encountered within any of the boreholes that have been drilled. The coal seams are also considered to be thin typically 0.1m to 0.4m in thickness.

Groundwater was not encountered during the drilling works.

### ***Risk from Potential Shallow Underground Mine Workings***

A Consultants Coal Mining Report has been obtained from The Coal Authority and a copy is presented in Appendix B.

The Coal Authority report states that there is no past underground mining recorded beneath the site.

The Coal Authority report also detailed that workable coal seams outcrop within, and to the south of the site.

As detailed above, a number of rotary boreholes have been drilled across the site in order to assess the potential risk to the proposed development from potential shallow unrecorded underground mine workings.

It is noted that a number of thin intact coal seams were encountered within the drilled depths of the rotary boreholes. The thin nature of the seams would indicate that they would have been uneconomic to work. No evidence of shallow mine workings was encountered within any of the rotary boreholes drilled across the site.

It is also noted that the Consultants Coal Mining Report from the Coal Authority states that the 'Probable unrecorded shallow workings' (i.e., areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface - less than 30 metres deep) at the site is "None."

Based on the findings of the rotary borehole investigation, the risk of potential shallow unrecorded mine workings affecting the proposed development is considered to be low. As such, it is considered that no specific remediation measures are required as part of the proposed development.

## ***Mine Gas Risk Assessment***

The site is located within a Coal Authority defined Coal Mining Reporting Area. As such, a mine gas risk assessment has been undertaken. CL:AIRE document 'Good Practice for Risk Assessment for Coal Mine Gas Emissions', dated October 2021 includes Figure 13.1 Decision Support Tool for Mine Gas Risk Assessment, to aid the risk assessment process and decision making, as shown in Appendix C.

Based on desk-based research, ground investigation data, and the CL:AIRE Decision Support Tool for Mine Gas Risk Assessment, the potential risk from coal mine gas emissions at the proposed development site is considered below.

The first stage of the CL:AIRE flow chart asks if the site is within a Coal Authority defined Coal Mining Reporting Area. Since the site is located within a Coal Authority defined Coal Mining Reporting Area, the flow chart then asks if **all** of the following statements are true:

- Mine entries >50m from site boundary,
- Workings >150m depth,
- No faults or other potential pathways connecting the surface to deeper unflooded workings,
- Outside areas of past or probable shallow workings on the Coal Authority viewer.

Our response to the Stage 1 statements is as follows:

- There are no mine entries located within 100m of the site boundary,
- The Consultants Coal Mining Report has been obtained from The Coal Authority (see Appendix B). This confirms that there are no workings recorded beneath the site,
- There are no recorded faults or other potential pathways connecting the surface to deeper unflooded workings,
- The site is outside areas of past or probable shallow workings on the Coal Authority viewer.

Based on the information gained from desk-based research and ground investigation data, it is considered that all the Stage 1 statements are true.

With the Stage 1 assessment statements considered to be true, the CL:AIRE Decision Support Tool for Mine Gas Risk Assessment places the site within a 'Negligible Risk Zone', requiring no further action.

We trust the above and enclosed are to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,



**Laura Pullin**  
**For**  
**Intégral Géotechnique (Wales) Limited**

***Encl.***

Appendix A – Rotary Borehole Logs

Appendix B – Consultants Coal Mining Report

Appendix C – CL:AIRE Decision Support Tool for Mine Gas Risk Assessment

Figure 1 – Site Location

Figure 2 – Exploratory Hole Location Plan

## **APPENDIX A**

### **ROTARY PROBEHOLE LOGS**

|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                                |    |
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| <div><div>Intégral</div><div>Géotechnique</div></div> <div>Intégral House, 7 Beddau Way<br/>Castlegate Business Park<br/>Caerphilly CF83 2AX<br/>Tel. 029 20807991<br/>Fax. 029 20862176<br/>mail@integralgeotec.com</div> |                  | Project Name:<br><b>7 Ten Acre Wood, Margam</b> |     |                         |     | Project No.:<br><b>14283</b> |              | Borehole No.:<br><b>BH01</b><br>Sheet 1 of 2 |                                                                                                                                                                                                                                                                                                                                              |                  |                                                |    |
| Location:<br>Port Talbot                                                                                                                                                                                                   |                  |                                                 |     | Client: Mr Andrew Hall  |     |                              |              | Coordinates:                                 |                                                                                                                                                                                                                                                                                                                                              | Hole Type:<br>RO |                                                |    |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |                  |                                                 |     | Diameter of Casing:     |     |                              |              | Level:                                       |                                                                                                                                                                                                                                                                                                                                              | Scale<br>1:100   |                                                |    |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |                  |                                                 |     | Depth of Casing: 15.50m |     |                              |              | Dates<br>25/09/2024 -                        |                                                                                                                                                                                                                                                                                                                                              | Logged By:       |                                                |    |
| Well                                                                                                                                                                                                                       | Water<br>Strikes | Rotary Coring                                   |     |                         |     |                              | Depth<br>(m) | Level<br>(m AOD)                             | N<br>Value                                                                                                                                                                                                                                                                                                                                   | Legend           | Stratum Description                            |    |
|                                                                                                                                                                                                                            |                  | Depth (m)                                       | TCR | SCR                     | RQD | FI                           |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | SAND and GRAVEL (Drillers Description).        | 1  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 15.40        |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | SANDSTONE (Drillers Description).              | 16 |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                                | 17 |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 18.90        |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | SANDSTONE and MUDSTONE (Drillers Description). | 19 |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                                | 20 |
| Remarks:<br>1. Borehole terminated at 35.0m bgl.                                                                                                                                                                           |                  |                                                 |     |                         |     |                              |              |                                              | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone)<br>W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |                  |                                                |    |

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| Location:<br>Port Talbot                                                                                                                                                                                                   |                  |                                                 |     | Client: Mr Andrew Hall  |     |                              |                | Coordinates:                                 |                                                                                                                                                                                                                                                                                                                                              | Hole Type:<br>RO |                                                                  |                                                                                                                      |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |                  |                                                 |     | Diameter of Casing:     |     |                              |                | Level:                                       |                                                                                                                                                                                                                                                                                                                                              | Scale<br>1:100   |                                                                  |                                                                                                                      |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |                  |                                                 |     | Depth of Casing: 15.50m |     |                              |                | Dates<br>25/09/2024 -                        |                                                                                                                                                                                                                                                                                                                                              | Logged By:       |                                                                  |                                                                                                                      |
| Well                                                                                                                                                                                                                       | Water<br>Strikes | Rotary Coring                                   |     |                         |     |                              | Depth<br>(m)   | Level<br>(m AOD)                             | N<br>Value                                                                                                                                                                                                                                                                                                                                   | Legend           | Stratum Description                                              |                                                                                                                      |
|                                                                                                                                                                                                                            |                  | Depth (m)                                       | TCR | SCR                     | RQD | FI                           |                |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                                                  |                                                                                                                      |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 27.00<br>27.10 |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                                                  | 21<br>22<br>23<br>24<br>25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34<br>35<br>36<br>37<br>38<br>39<br>40 |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |                |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | COAL (Drillers Description).<br>MUDSTONE (Drillers Description). |                                                                                                                      |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 32.40<br>32.80 |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | COAL (Drillers Description).<br>MUDSTONE (Drillers Description). |                                                                                                                      |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 35.00          |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | End of Borehole at 35.00 m                                       |                                                                                                                      |
| Remarks:<br>1. Borehole terminated at 35.0m bgl.                                                                                                                                                                           |                  |                                                 |     |                         |     |                              |                |                                              | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone)<br>W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |                  |                                                                  |                                                                                                                      |

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| Location:<br>Port Talbot                                                                                                                                                                                                   |                  |                                                 |     | Client: Mr Andrew Hall  |     |                              |              | Coordinates:                                 |                                                                                                                                                                                                                                                                                                                                              | Hole Type:<br>RO |                                         |    |  |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |                  |                                                 |     | Diameter of Casing:     |     |                              |              | Level:                                       |                                                                                                                                                                                                                                                                                                                                              | Scale<br>1:100   |                                         |    |  |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |                  |                                                 |     | Depth of Casing: 15.50m |     |                              |              | Dates<br>25/09/2024 -                        |                                                                                                                                                                                                                                                                                                                                              | Logged By:       |                                         |    |  |
| Well                                                                                                                                                                                                                       | Water<br>Strikes | Rotary Coring                                   |     |                         |     |                              | Depth<br>(m) | Level<br>(m AOD)                             | N<br>Value                                                                                                                                                                                                                                                                                                                                   | Legend           | Stratum Description                     |    |  |
|                                                                                                                                                                                                                            |                  | Depth (m)                                       | TCR | SCR                     | RQD | FI                           |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | SAND and GRAVEL (Drillers Description). | 1  |  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 15.50        |                                              |                                                                                                                                                                                                                                                                                                                                              |                  | MUDSTONE (Drillers Description).        | 16 |  |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                         | 17 |  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                                                                                                                                                              |                  |                                         | 20 |  |
| Remarks:<br>1. Borehole terminated at 35.0m bgl.                                                                                                                                                                           |                  |                                                 |     |                         |     |                              |              |                                              | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone)<br>W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |                  |                                         |    |  |



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| <div><div>Intégral</div><div>Géotechnique</div></div> <div>Intégral House, 7 Beddau Way<br/>Castlegate Business Park<br/>Caerphilly CF83 2AX<br/>Tel. 029 20807991<br/>Fax. 029 20862176<br/>mail@integralgeotec.com</div> |                  | Project Name:<br><b>7 Ten Acre Wood, Margam</b> |     |                         |     | Project No.:<br><b>14283</b> |              | Borehole No.:<br><b>BH03</b><br>Sheet 1 of 2 |                                                                                                                                                                                                    |                  |                                         |                                                                                                                                        |  |  |
| Location:<br>Port Talbot                                                                                                                                                                                                   |                  |                                                 |     | Client: Mr Andrew Hall  |     |                              |              | Coordinates:                                 |                                                                                                                                                                                                    | Hole Type:<br>RO |                                         |                                                                                                                                        |  |  |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |                  |                                                 |     | Diameter of Casing:     |     |                              |              | Level:                                       |                                                                                                                                                                                                    | Scale<br>1:100   |                                         |                                                                                                                                        |  |  |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |                  |                                                 |     | Depth of Casing: 15.00m |     |                              |              | Dates<br>26/09/2024 -                        |                                                                                                                                                                                                    | Logged By:       |                                         |                                                                                                                                        |  |  |
| Well                                                                                                                                                                                                                       | Water<br>Strikes | Rotary Coring                                   |     |                         |     |                              | Depth<br>(m) | Level<br>(m AOD)                             | N<br>Value                                                                                                                                                                                         | Legend           | Stratum Description                     |                                                                                                                                        |  |  |
|                                                                                                                                                                                                                            |                  | Depth (m)                                       | TCR | SCR                     | RQD | FI                           |              |                                              |                                                                                                                                                                                                    |                  | SAND and GRAVEL (Drillers Description). |                                                                                                                                        |  |  |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                    |                  |                                         | 1                                                                                                                                      |  |  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                    |                  |                                         | 12                                                                                                                                     |  |  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                    |                  |                                         | 14                                                                                                                                     |  |  |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              | 15.00        |                                              |                                                                                                                                                                                                    |                  | SANDSTONE (Drillers Description).       | 15                                                                                                                                     |  |  |
|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                    |                  |                                         | 16                                                                                                                                     |  |  |
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|                                                                                                                                                                                                                            |                  |                                                 |     |                         |     |                              |              |                                              |                                                                                                                                                                                                    |                  |                                         | 20                                                                                                                                     |  |  |
| Remarks:<br>1. Borehole terminated at 35.0m bgl.                                                                                                                                                                           |                  |                                                 |     |                         |     |                              |              |                                              | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone) |                  |                                         | W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |  |  |

|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------|-----|------------------------------|-----|----------------------------------------------|----------------|---------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----|
| <div><div>Intégral</div><div>Géotechnique</div></div> <div>Intégral House, 7 Beddau Way<br/>Castlegate Business Park<br/>Caerphilly CF83 2AX<br/>Tel. 029 20807991<br/>Fax. 029 20862176<br/>mail@integralgeotec.com</div> |               | Project Name:<br><b>7 Ten Acre Wood, Margam</b> |     | Project No.:<br><b>14283</b> |     | Borehole No.:<br><b>BH03</b><br>Sheet 2 of 2 |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
| Location:<br>Port Talbot                                                                                                                                                                                                   |               | Client: Mr Andrew Hall                          |     | Coordinates:                 |     | Hole Type:<br>RO                             |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |               | Diameter of Casing:                             |     | Level:                       |     | Scale<br>1:100                               |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |               | Depth of Casing: 15.00m                         |     | Dates<br>26/09/2024 -        |     | Logged By:                                   |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
| Well                                                                                                                                                                                                                       | Water Strikes | Rotary Coring                                   |     |                              |     |                                              | Depth (m)      | Level (m AOD) | N Value | Legend                                                                                                                                                                                                                                                                                                                                       | Stratum Description                                              |    |
|                                                                                                                                                                                                                            |               | Depth (m)                                       | TCR | SCR                          | RQD | FI                                           |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  |    |
|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              | 23.00          |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 21 |
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|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              | MUDSTONE (Drillers Description).                                 | 23 |
|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 24 |
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|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 31 |
|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 32 |
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|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              | 35.00          |               |         |                                                                                                                                                                                                                                                                                                                                              | End of Borehole at 35.00 m                                       | 35 |
|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 36 |
|                                                                                                                                                                                                                            |               |                                                 |     |                              |     |                                              |                |               |         |                                                                                                                                                                                                                                                                                                                                              |                                                                  | 37 |
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| Remarks:<br>1. Borehole terminated at 35.0m bgl.                                                                                                                                                                           |               |                                                 |     |                              |     |                                              |                |               |         | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone)<br>W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |                                                                  |    |



|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
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| <div><div>Intégral</div><div>Géotechnique</div></div> <div>Intégral House, 7 Beddau Way<br/>Castlegate Business Park<br/>Caerphilly CF83 2AX<br/>Tel. 029 20807991<br/>Fax. 029 20862176<br/>mail@integralgeotec.com</div> |               | Project Name:<br>7 Ten Acre Wood, Margam |     |     |     | Project No.:<br>14283 |           | Borehole No.:<br>BH04<br>Sheet 2 of 2 |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
| Location:<br>Port Talbot                                                                                                                                                                                                   |               | Client: Mr Andrew Hall                   |     |     |     | Coordinates:          |           | Hole Type:<br>RO                      |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
| Equipment: FRASTE PLG                                                                                                                                                                                                      |               | Diameter of Casing:                      |     |     |     | Level:                |           | Scale<br>1:100                        |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
| Diameter of Boring: 115mm                                                                                                                                                                                                  |               | Depth of Casing: 15.00m                  |     |     |     | Dates<br>24/09/2024 - |           | Logged By:                            |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
| Well                                                                                                                                                                                                                       | Water Strikes | Rotary Coring                            |     |     |     |                       | Depth (m) | Level (m AOD)                         | N Value | Legend                                                                                                                                                                                                                                                                                                                                       | Stratum Description                |    |
|                                                                                                                                                                                                                            |               | Depth (m)                                | TCR | SCR | RQD | FI                    |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    |    |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 22.10     |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    | 21 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 22.40     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | COAL (Drillers Description).       | 22 |
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|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 28.00     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | COAL bands (Drillers Description). | 28 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 28.60     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | MUDSTONE (Drillers Description).   | 29 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    | 30 |
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|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 35.00     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | COAL (Drillers Description).       | 35 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 35.40     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | MUDSTONE (Drillers Description).   | 36 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       | 36.50     |                                       |         |                                                                                                                                                                                                                                                                                                                                              | End of Borehole at 36.50 m         | 37 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    | 38 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    | 39 |
|                                                                                                                                                                                                                            |               |                                          |     |     |     |                       |           |                                       |         |                                                                                                                                                                                                                                                                                                                                              |                                    | 40 |
| Remarks:<br>1. Borehole terminated at 36.5m bgl.                                                                                                                                                                           |               |                                          |     |     |     |                       |           |                                       |         | Key:<br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone)<br>W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |                                    |    |

## **APPENDIX B**

**CONSULTANTS COAL MINING REPORT FROM THE COAL AUTHORITY**



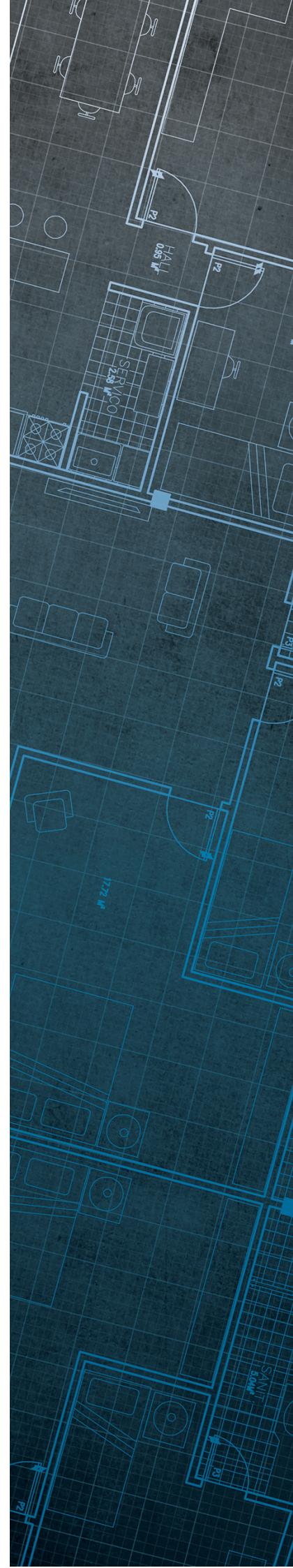
The Coal  
Authority

# Consultants Coal Mining Report

7 Ten Acre Wood  
Margam  
Neath Port Talbot  
SA13 2SU

|                        |                  |
|------------------------|------------------|
| Date of enquiry:       | 24 November 2023 |
| Date enquiry received: | 24 November 2023 |
| Issue date:            | 24 November 2023 |

|                 |                |
|-----------------|----------------|
| Our reference:  | 51003391531001 |
| Your reference: | 14283/LP       |



# Consultants

# Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

## Client name

INTEGRAL GEOTECHNIQUE (WALES) LTD.

## Enquiry address

7 Ten Acre Wood  
Margam  
Neath Port Talbot  
SA13 2SU

## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

200 Lichfield Lane  
Mansfield  
Nottinghamshire  
NG18 4RG

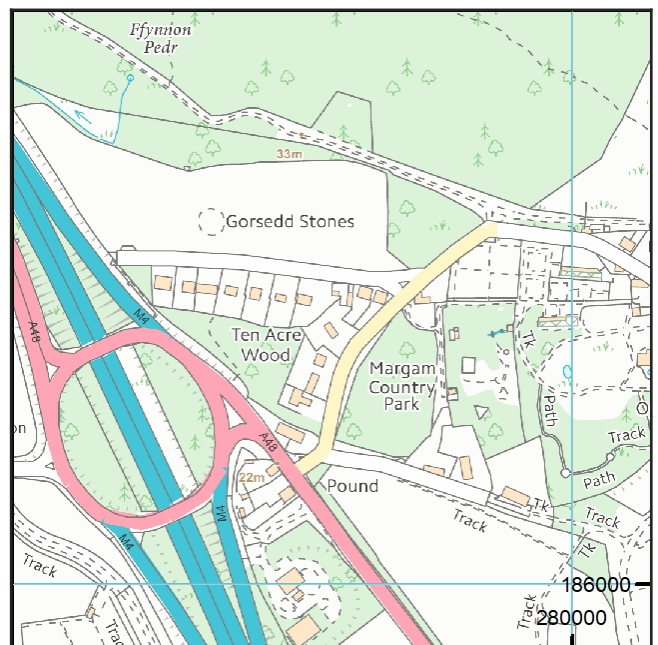
[www.groundstability.com](http://www.groundstability.com)

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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# Section 1 – Mining activity and geology

## Past underground mining

No past mining recorded.

## Probable unrecorded shallow workings

None.

## Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

## Mine entries

None recorded within 100 metres of the enquiry boundary.

## Abandoned mine plan catalogue numbers

None available.

## Outcrops

| Seam name         | Mineral | Seam workable | Distance to outcrop (m) | Direction to outcrop | Bearing of outcrop |
|-------------------|---------|---------------|-------------------------|----------------------|--------------------|
| 2FT NINE MID LEAF | Coal    | Yes           | Within                  | N/A                  | 285                |
| UPPER FOUR FOOT   | Coal    | Yes           | 31.6                    | South                | 285                |

## Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

## Opencast mines

None recorded within 500 metres of the enquiry boundary.

## Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

## Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

### Site investigations

None recorded within 50 metres of the enquiry boundary.

### Remediated sites

None recorded within 50 metres of the enquiry boundary.

### Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

### Mine gas

None recorded within 500 metres of the enquiry boundary.

### Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

## Section 3 – Licensing and future mining activity

### Future underground mining

None recorded.

### Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

### Court orders

None recorded.

### Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

### Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

### Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

## Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

### Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

**MINE GAS:** Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

## Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at [groundstability@coal.gov.uk](mailto:groundstability@coal.gov.uk)**.

### Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

### Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

### Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

### Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

### Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

### Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

### Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

### **Opencast mines**

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

### **Coal Authority managed tips**

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

### **Site investigations**

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

### **Remediated sites**

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

### **Coal mining subsidence**

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

### **Mine gas**

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

### **Mine water treatment schemes**

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

### **Future underground mining**

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

### **Coal mining licensing**

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

### **Court orders**

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

### **Section 46 notices**

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

### **Withdrawal of support notices**

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

### **Payment to owners of former copyhold land**

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

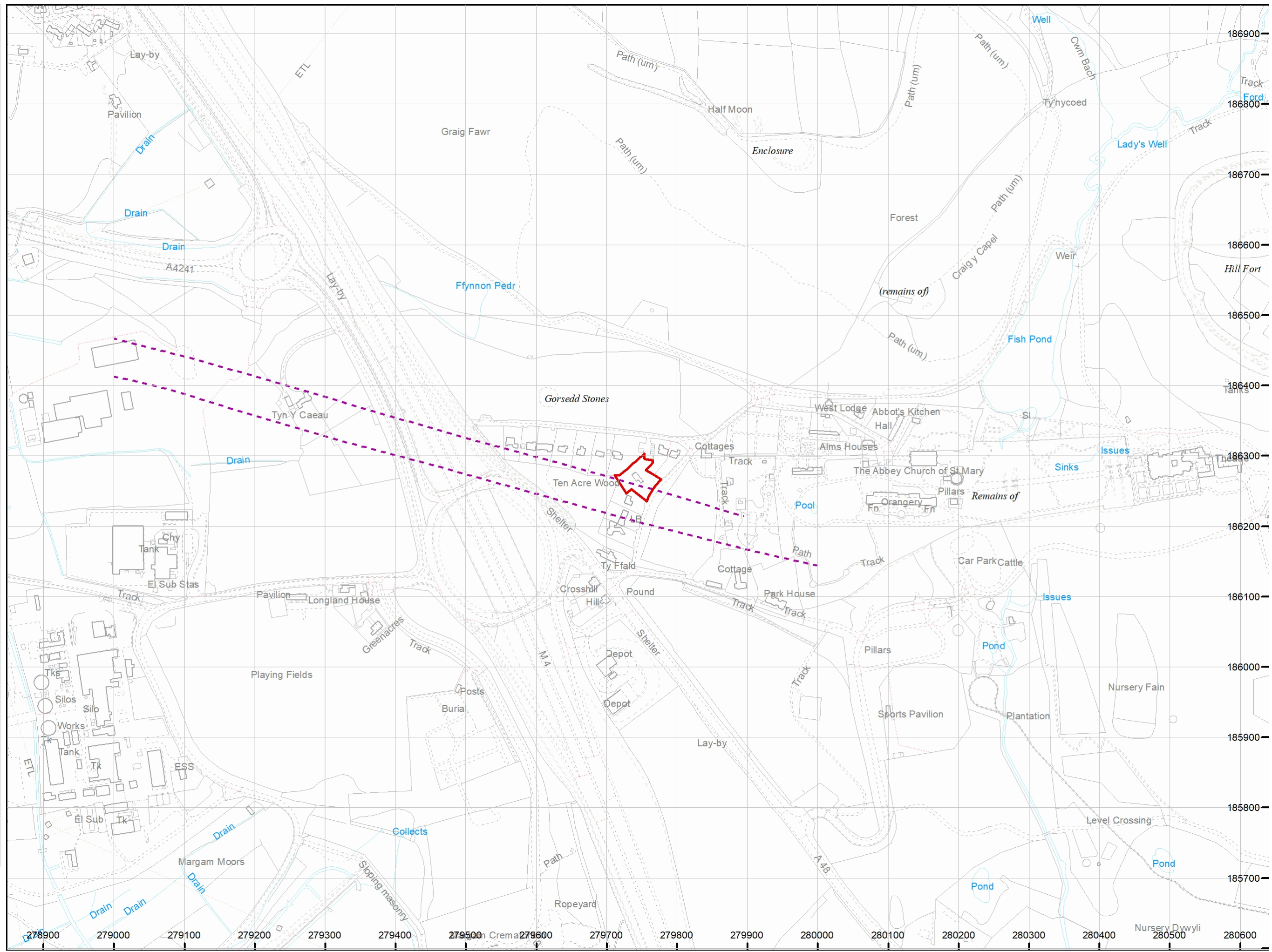
**Key**

Approximate position of the enquiry boundary shown 

Outcrop (Conjectured) 

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## **APPENDIX C**

**CL:AIRE DECISION SUPPORT TOOL FOR MINE GAS RISK ASSESSMENT**

## NOTE 1 PRELIMINARY INFORMATION REQUIREMENTS

Before proceeding further with the decision process the following should be in place:

1. Sufficient information to develop an initial schematic CSM. This should be a site specific visual CSM (i.e. geological cross section showing development proposals including foundations, mine entries and workings with relevant seam levels). Examples of visual CSMs are provided in Appendix 4 (Case studies).
2. Comprehensive desk study information collected from sources including Coal Authority Consultants Report and other data.
3. Data has been checked and is sufficiently robust to allow the preliminary mine gas risk assessment and design of any site investigation if required.

## NOTE 2 DECISION PROCESS

The decision process is started with a desk-based study. The process is followed and at any point if site investigation data is required to confirm any specific factor then a suitable investigation should be designed, the data collected and then the decision process restarted.

For example, where workings are considered permanently flooded at shallow depth, groundwater level monitoring may be required to confirm likely variations will not cause levels to drop below the level of the workings. Likewise, site investigation may be required to confirm the thickness and nature of any low permeability layer to determine if it can be relied on as a barrier to potential gas migration.

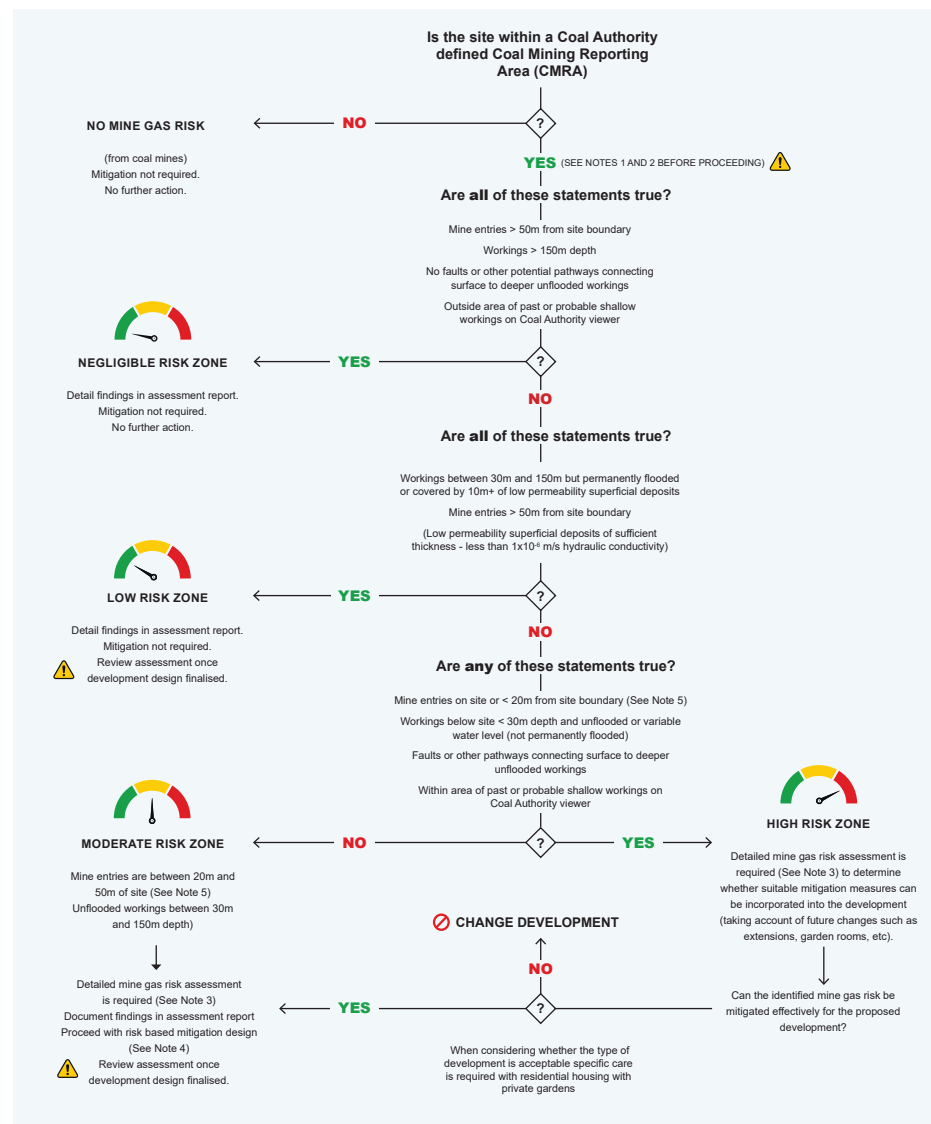
## NOTE 3 DETAILED MINE GAS RISK ASSESSMENT

Detailed mine gas risk assessment will require suitable site investigation and use of a multiple lines of evidence approach to risk assessment.

Consider - depth and permeability of drift deposits and if >5m to rock head from underside of foundations and drainage trenches (including any deep soak away or attenuation tanks).

Model and assess gas migration rates through the ground using approaches in the Ground Gas Handbook.

Assess whether shafts or other pathways are connected to unflooded deep or shallow workings. Assess risk of gas migration from shaft or adit (consider filling, capping type, any venting and geology and relationships between flow rates and meteorological conditions) - see next column.



## NOTE 3 (CONTINUED)

Detailed assessment of gas monitoring data looking for correlations of flow rates with barometric pressure, temperature, groundwater levels and whether elevated flows are likely to be associated with mine gas emissions, consideration of gas ratios and other potential sources of gas.

Assess volume of potential gas reservoir that could accumulate in workings.

Assess impact on the gas risk of any grouting works to shallow mine workings. Consider relevant uncertainties from Table 14.1.

Consider credible future changes that could impact on mine gas risk (water level changes or grouting in connected workings).

Consider risk to external areas (gardens, landscaped areas) e.g. sheds. The rate of gas emissions from open fractures or shafts can overcome the ventilation in these types of buildings.

Consider floor construction and resistance to gas ingress.

## NOTE 4 DESIGN OF GAS PROTECTION SYSTEM

Design gas protection measures (see CIRIA Site Guide for Hazardous Ground Gases for guidance on procurement and competence). The points system in BS 8485 should not be used, site specific detailed risk-based design is required.

Specify requirements for floor slab construction (with respect to gas protection).

Specify appropriate gas membrane.

Design venting layer if required based on estimated gas expansion and flow rate from mine workings during fall in barometric pressure (see CL:AIRE TB17 for critical events).

Consider implications of residual uncertainty on mitigation design.

Review design once all other elements of the development design are finalised.

Decision points

## NOTE 5 ADITS

Adits require specific consideration of their direction in relation to the development. In cases where the adit entry is close to the development (between 20m and 50m or less than 20m) but it dips in the opposite direction, it might not be considered a pathway for mine gas emissions and may be considered low risk.

Figure 13.1: Decision support tool for mine gas risk assessment – page 35.

## FIGURES



NORTH

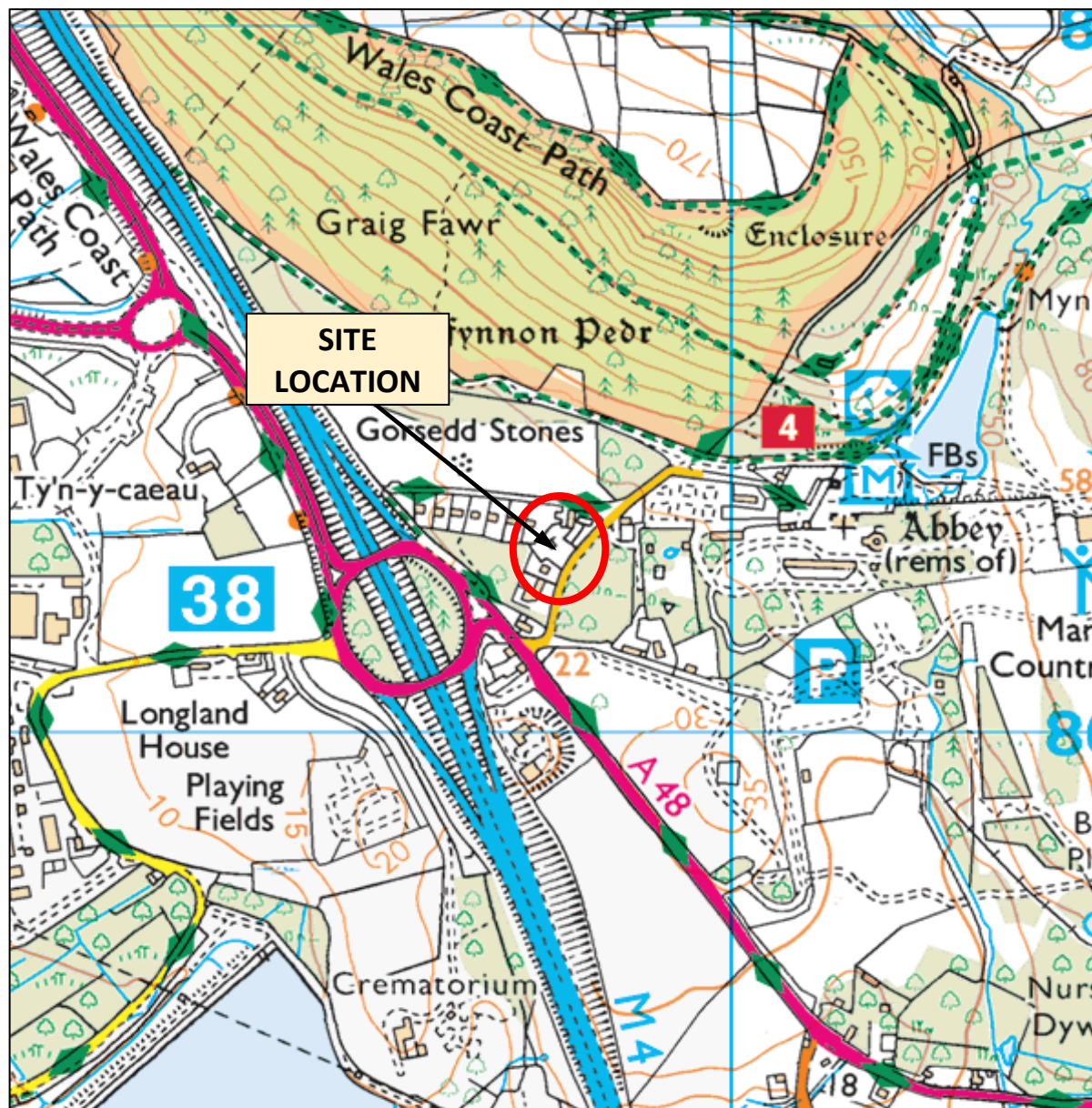


FIGURE 1: SITE LOCATION

7 Ten Acre Wood, Margam

**Intégral**  
Géotechnique

Intégral House  
7 Beddau Way  
Castlegate Business Park  
Caerphilly  
CF83 2AX  
Tel: 029 2080 7991

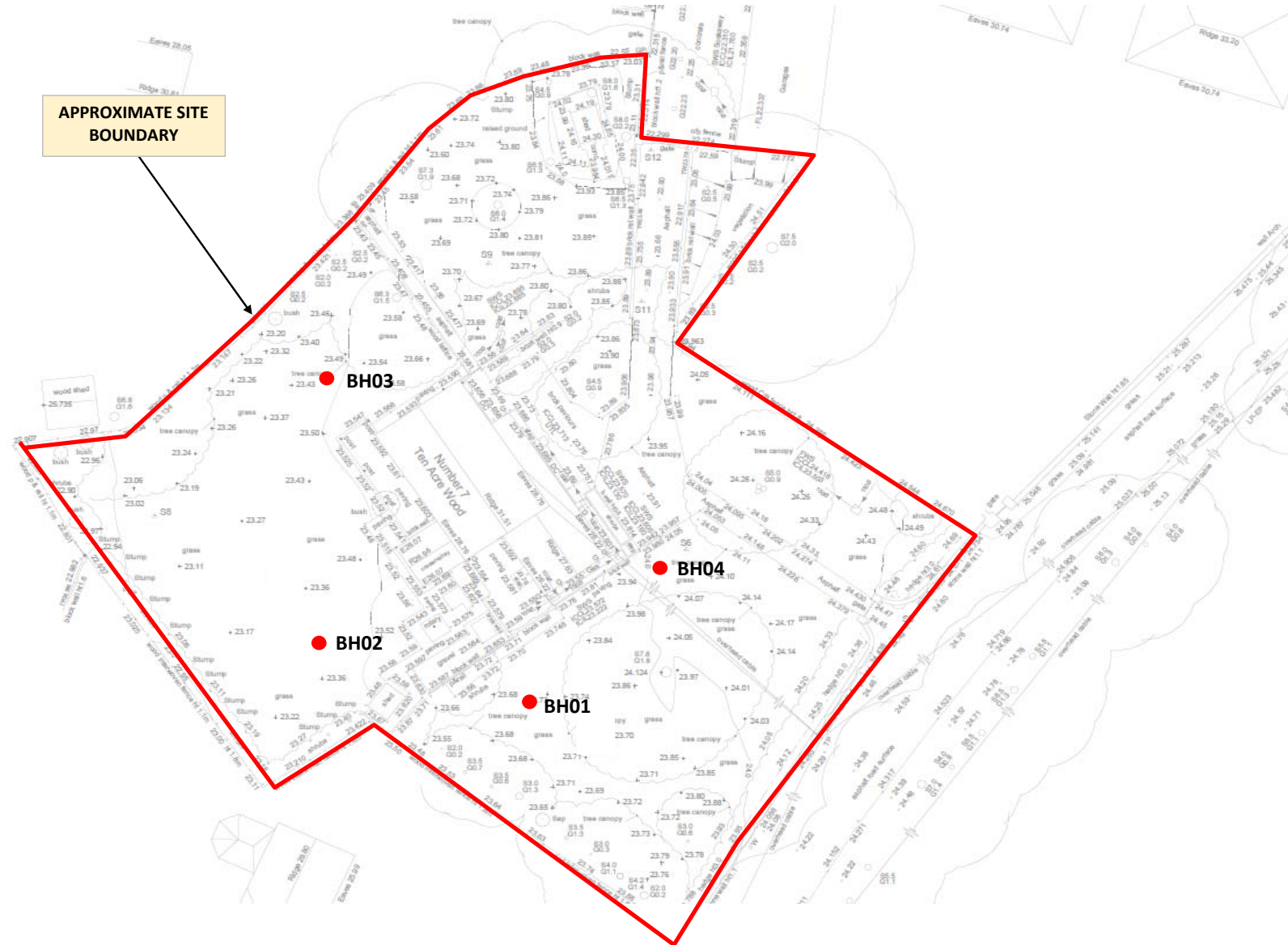


FIGURE 2: EXPLORATORY HOLE LOCATION PLAN

7 Ten Acre Wood, Margam



Integral House  
7 Beddau Way  
Castlegate Business Park  
Caerphilly  
CF83 2AX  
Tel: 029 2080 7991