| Report No | Date |
|---|---|
| 22181/R4 | **June 2025** |

Project

# BLAENDULAIS – PHASE 2 GROUND INVESTIGATION

Client

**TRJ**

**Spectrum Geo Services**
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| **BLAENDULAIS – PHASE 2 GROUND INVESTIGATION** |

| Issue Number | Status | Description of Amendments |
|---|---|---|
| **1** | **Draft** | |
| **2** | **Final** | |
| 3 | **Final** | Groundwater and Leachate added |
| 4 | **Final** | Revisions to Table 12.1 |
| | | |

| **Report prepared by:** | |
|---|---|
| Signed  | June 2025 |

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# Executive Summary

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| The Site | The site is located within the town of Seven Sisters, which is approximately 12 miles northeast of Port Talbot. The site is approximately 0.228ha in area and is centered on National Grid reference (NGR) SN 81942 08914.<br><br>The approximate postcode for the site is SA10 9DN.<br><br>The site address is Land opposite, High St, Seven Sisters, Neath SA10 9DN.<br><br>The site remained mostly undeveloped with a railway station to the east. By 1918, railway sidings had appeared in the north eastern corner. A toilet block had been constructed in the south western corner by 1962. By 1987 a large building had been constructed (Canolfan). At some time post 2003, that building has been demolished.<br>The surrounding area is dominated by further residential and commercial properties which occupy the south eastern and north eastern site boundaries. The site is bounded to the east by a railway line which had already been constructed at the time of the first OS map publication in 1877 and the A4109 beyond. |
| Geology | The published geological map for the area, BGS Sheet 231 (1979), and the BGS GeoIndex Onshore online viewer (2024) show the north of the site to be located on recent Glaciofluvial deposits (Diamicton Till). The south of the site is not shown to contain superficial deposits. The underlying bedrock is indicated to comprise South Wales Middle Coal Measures Formation of Carboniferous age characterised by Mudstone, Siltstone and Sandstone.<br><br>The Coal Authority report for the site indicates that the Gorllwyn Seam outcrops beneath the site and could have been subject to unrecorded shallow mining activities. |
| Site Investigation | The site investigation was undertaken between 29 and 30 September 2023, and augmented on 19 February 2025:<br><br>- Two combined dynamic sample and rotary open hole boreholes (BH03 and BH04) to a depth of 30metres, with sampling and SPTs in the upper 10metres. BH03 had a 50mm monitoring standpipe installed.<br><br>- Five Window Sample holes to refusal at depths ranging between 0.45 and 1.5m bgl, with regular SPTs and |

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| | samples taken.<br><br>- Ten machine dug trial pits, mostly to refusal, terminating at between 0.4m and 1.50m.<br><br>- BRE Soakaway testing at 3 locations.<br><br>- Representative soil samples tested in the laboratory for geotechnical and geo-environmental parameters, both total and leachate.<br><br>- Monitoring of gas/groundwater conditions on site and adjacent.<br><br>- Chemical Analysis of groundwater |
| Ground Conditions | The sequence of strata encountered beneath the site comprised;<br><br>· Made Ground – comprising general building demolition material or colliery spoil<br>· Glaciofluvial deposits (Diamicton Till).<br><br>· South Wales Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone) |
| Geotechnical Assessment | Traditional shallow foundations (pad or strip) placed with Glacial Deposits may be designed to an allowable net bearing capacity of 100kPa which will result in settlement of no more than 25mm for foundations of no more than 0.50m wide.<br><br>Given the presence of variable made ground across the site, the use of suspended floor slabs is recommended.<br><br>For buried concrete the Design Sulphate Class for the site can be taken as DS-1 and the Aggressive Chemical Environment for Concrete (ACEC) site classification can be taken as AC-1.<br><br>Dewatering of temporary excavations may not be required but should be anticipated during winter months.<br><br>A conservative CBR value of 5% is recommended for preliminary pavement design.<br><br>It may be necessary to grub out the existing foundations to allow for construction of any new foundations. |
| Coal Mining Risk Assessment | The risk assessment indicates that there is a Low Risk of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site. Following the drilling of two rotary openhole boreholes no workings were encountered in the Gorwllyn seam. |
| Ground Contamination Assessment | Laboratory testing on 13 samples, has recorded a single elevated Arsenic value in relation to POSResi limits. Given the context of the development and the predominant hardstanding, there is considered to be no significant risk to site users. Leachate testing on 2 soil samples found no exceedances. Testing of a |

| | |
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| | groundwater sample found no exceedances to UK Drinking Water Standards. |
| Ground Gas Assessment | Ground gas monitoring undertaken on the site has recorded limited concentrations of carbon dioxide and methane within the subsurface. The site has been defined as a Characteristic Situation 1 (Very Low risk) whereby no ground gas protection measures are considered necessary within the context of the proposed development. |
| Conclusions and Recommendations | Based on the findings of the ground investigation, the following recommendations are outlined:<br><br>• A Reactive Strategy should be developed for the site to outline the requirements for identification, assessment and management of any areas of previously unidentified contamination encountered during the development phase;<br><br>• Movement of materials on the site should be undertaken in conjunction with a Materials Management Plan in line with the recommendations in the CL:AIRE Code of Practice to confirm any materials utilised on site are geotechnically and chemically suitable for re-use and to ensure all materials leaving site are disposed of at a suitable waste disposal facility;<br><br>• It remains the responsibility of the contractor as waste producer to classify any waste materials and identify a suitable off site disposal facility.<br><br>• There may be subsurface obstructions due to the former site use. |

# 1.0 INTRODUCTION

## 1.1 Introduction

Spectrum Geo Services (SGS) were commissioned by TRJ Ltd. to complete a Phase 2 investigation of a site at Blaendulais, Seven Sisters, SA10 9DN. This report should be read in conjunction with 22181_R2, Phase 1.

The site is approximately 0.228ha in area and is centred on National Grid Reference (NGR) 81942, 08914. The approximate postcode of the site being SA10 9DN.

SGS had also completed a review of previous data obtained on the adjacent NPT land (22181_R1) dated August 2023.

## 1.2 Scope of Works

The objectives of this assessment are to undertake a Phase 2 Ground Investigation. This assessment is augmented by the data within the adjacent Tetra Tech Ground Investigation report, which is appended for clarity and was undertaken at the site bounding the site, immediately to the south and is considered, together with other Phase 1 data, to be relevant to the scheme. The assessment is undertaken in accordance with the requirements of the Land Contamination Risk Assessment (LCRM) Guidance.

This report includes the following key elements:

- *Full factual records of the site works carried out;*
- *Summary of the ground conditions encountered;*
- *In-Situ testing results;*
- *Environmental laboratory testing results;*
- *Geotechnical laboratory testing results;*
- *Interpretation of Geotechnical and Environmental laboratory data, including a qualitative ground contamination risk assessment (compliant with CIRIA 552 (CIRIA, 2001) methodology);*
- *Mine Gas Risk Assessment;*
- *An executive summary of the report to allow a rapid, layman's overview.*

## 1.3 Proposed Development

From information provided by NPTC it is understood that the purpose of this desk study and ground investigation is to inform of site conditions for the proposed development of a childcare unit (single story) to include, but is not limited to the following:

- *The construction of a single story child care unit (shown to include toilets, store rooms, kitchens and plant rooms).*
- *Staff and public parking area and roadways*
- *Bin store*

## 1.4 Limitations

Subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent from the data available for review.

## 2.0 SUMMARY OF SITE INFORMATION

### 3.1 Site Location

Blaendulais, Seven Sisters is a village which lies 13.5 km northeast of Neath, lying within Neath Port Talbot County Borough. The proposed site is located at National Grid reference SN 819 089, see Site Location Plan Figure 1.

The site is currently an unused, largely overgrown Brownfield site. The topography of the site is relatively flat, with the highest point being the southern boundary of the site.

The site comprises established trees along the eastern boundary and is generally largely overgrown. A site walkover was undertaken and is appended.

At the time of the investigation, the site comprised an open area of predominantly rough grass.

The site is bounded by High Street to the west, rough ground to the south and a rail line to the east, running north south, roads to the south (Commercial Street) and west (High Street).

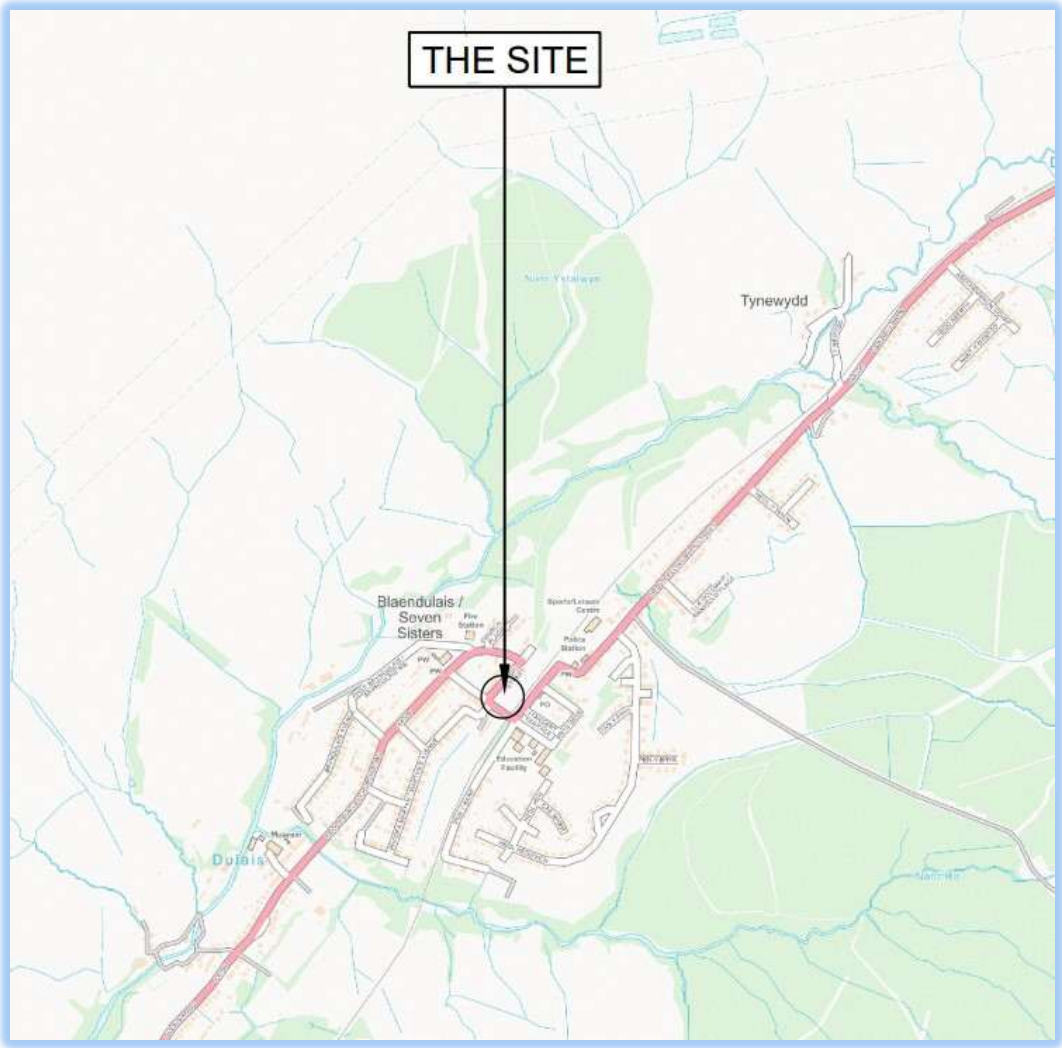



***Figure 01.***

The planning red line is shown in Figure 2.

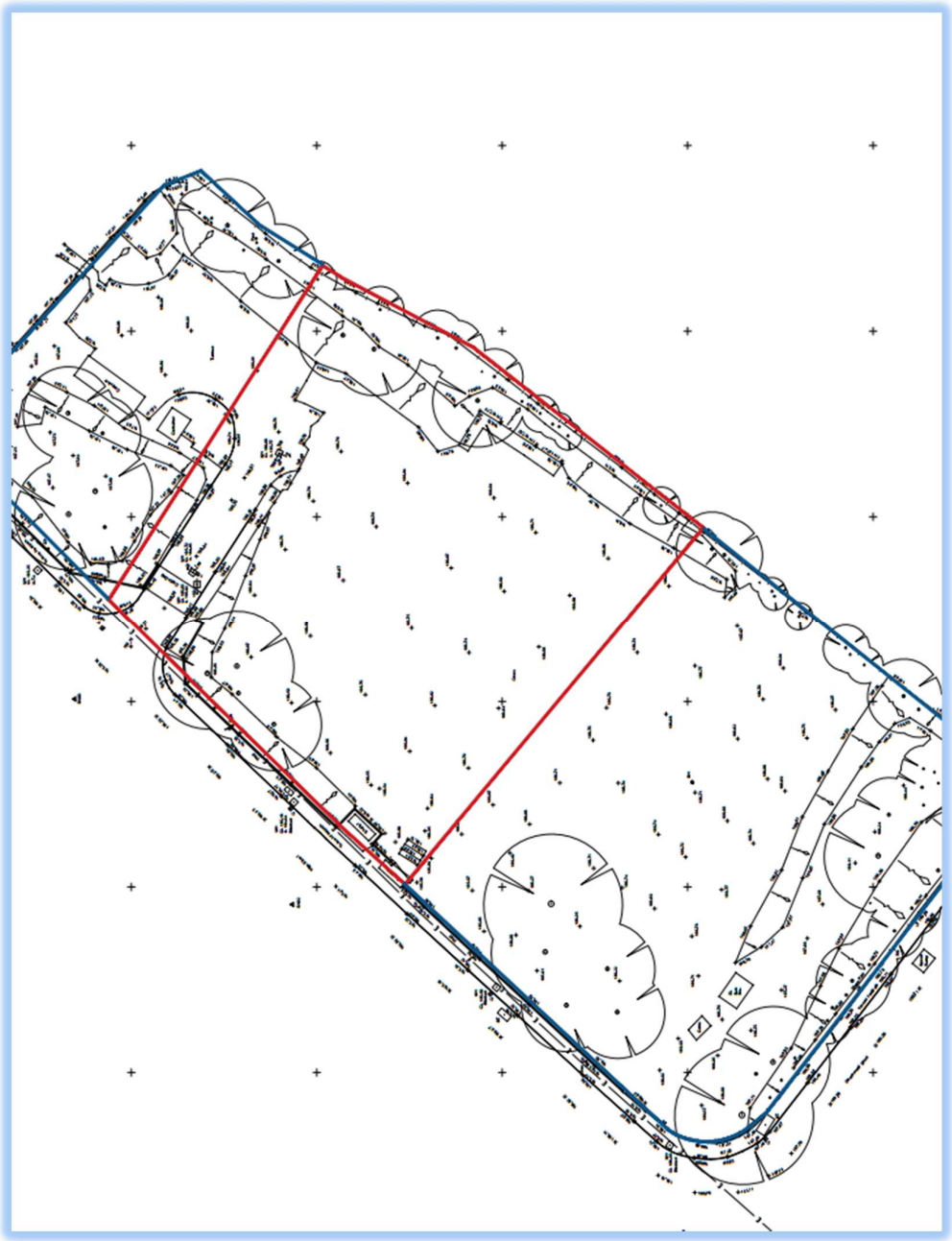


***Figure 2: Planning Red Line Boundary***

## 3.2 Published Geology

Information published by the British Geological Survey (BGS) suggests the site to be underlain by a sequence comprising;

Details of the geology underlying the site have been obtained from the following sources:

- *British Geological Survey (BGS) Sheet No.231 Merthyr Tydfil Solid and Drift Edition / Solid Edition etc, 1:50 000 or 1:63,000 scale;*
- *BGS website (British Geological Survey, 2022); accessed 07/06/2022;*
- *Coal Authority Interactive Mapper (The Coal Authority, 2021),*

**Made Ground**

The BGS interactive mapping does not show the presence of any Made Ground on site. However, due to the known site history and the site being classified as a Brownfield site, Made Ground is anticipated beneath the surface across the site. The Made Ground is likely to be comprised of building demolition rubble.

**Superficial Geology**

The BGS Geoindex indicates that superficial deposits are present at the site. The superficial deposits on site are anticipated to comprise of Glaciofluvial deposits (Diamicton Till). These deposits are sedimentary deposits and glacigenic in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits.

**Solid Geology**

The BGS Geoindex indicates that the solid geology underlying the site is comprised of the South Wales Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone) of Carboniferous Age. The BGS Geoindex describes the formation as *"grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones".*

The hard copy Geological Survey of Great Britain Merthyr Tydfil map (Sheet 231 1:50,000 Series Drift or Solid) shows a mine entry to the north of the site (circa 100m) with some artificial ground beyond. No coal outcrops are shown to

be present beneath the site and the regional geological dip is indicated to be 10 degrees to the south southwest.

The online Coal Authority Interactive map differs to the Geological map and indicates a proved coal seam outcropping beneath the site, trending south-southwest to north northeast close to the western boundary of the site and dipping to the right(east).

This is also confirmed in the Coal Authority Report Consultant report, although the seam is indicated to stop circa 50m north of the site. The seam is identified as the Gorllwyn, workable with a bearing of 36 degrees.

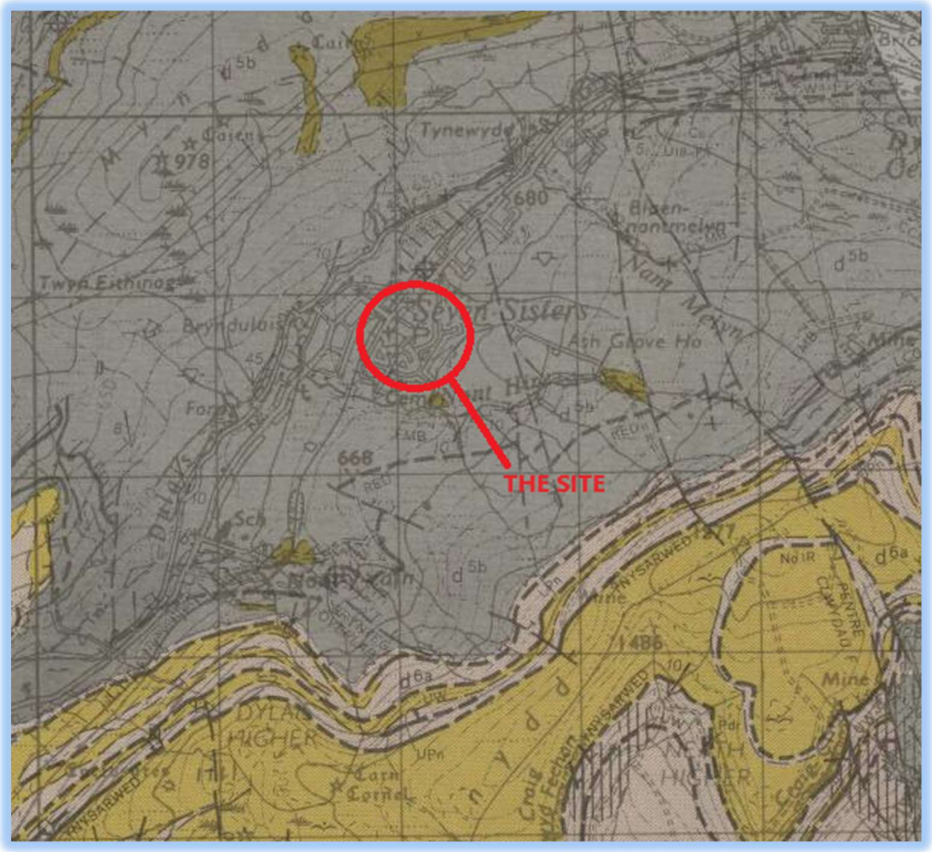



***Figure 03: Geological Setting***

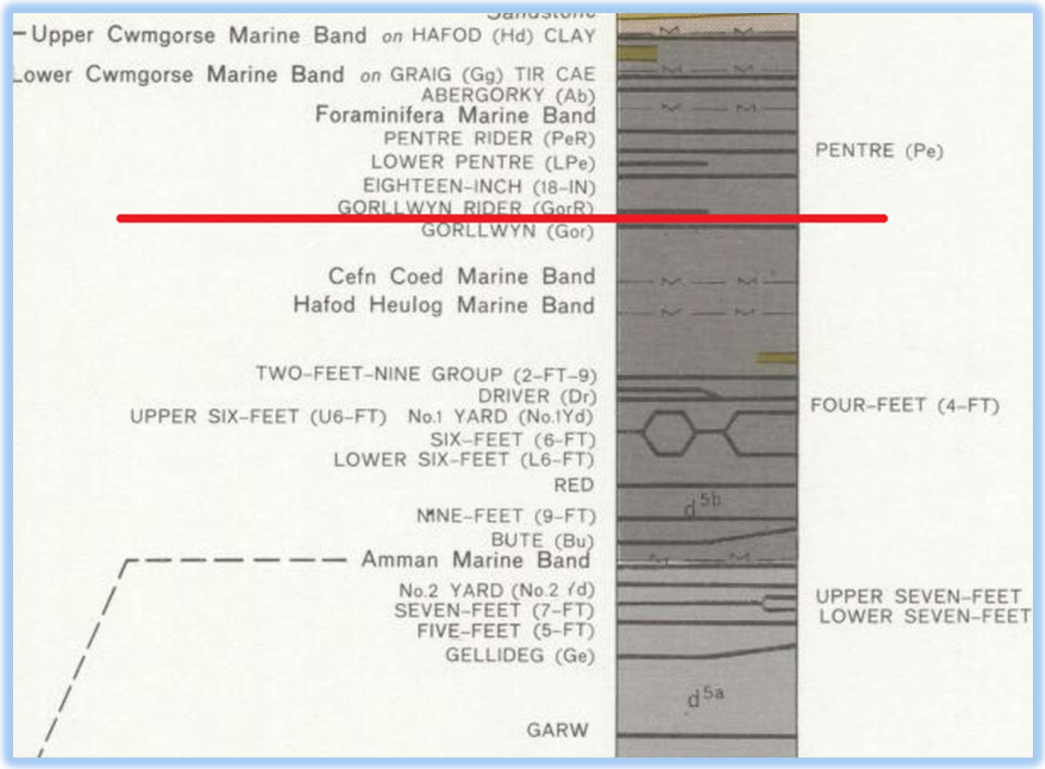



***Figure 4: Geological Column***

## 3.3 Hydrology

The site lies to the east of the River Avan, with elevated ground to the west.

Thus, it is anticipated that the predominant groundwater flow is in a south westerly direction.

## 3.4 Hydrogeology

The South Wales Middle Coal Measures Formation is designated as a Secondary A Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The Superficial Deposits of Diamicton Till are classified as a Secondary Undifferentiated Aquifer. This has been assigned in cases where it has not been possible to attribute either a Secondary A or B aquifer to the soil type due to the variable characteristics.

## 3.5 Radon

The BRE document 211 (Scivyer, 2015) mapping coverage for the site area was consulted and indicates that the site is located within an area where no radon protection measures are required for new developments. The entirety of the site is situated within an area where less than 1% of homes are above the action level.

## 3.6 Summary of Site History

A Desktop study has been previously undertaken 22181_R2 (Phase 1). The site history is summarised below.

The site remained mostly undeveloped with a railway station to the east. By 1918, railway sidings had appeared in the north eastern corner. A toilet block had been constructed in the south western corner by 1962. . By 1987 a large building had been constructed (Canolfan). At some time post 2003, that building has been demolished.

The surrounding area is dominated by further residential and commercial properties which occupy the south eastern and north eastern site boundaries. The site is bounded to the east by a railway line which had already been constructed at the time of the first OS map publication in 1877 and the A4109 beyond.

# 4.0 SITE INVESTIGATION

## 4.1 Site Works

Initial works comprised dynamic windowless sampling, 5 machine dug trial pits and 2 rotary drilled probe holes, employing water flush and Klemm drill rig. These were drilled on 29 and 30 September 2023 and supplemented with a further 6 trial pits on 19 February 2025. Hand dug pits were undertaken adjacent to TP01 and 07 to obtain soil samples for Leachate Testing. The positions are shown on Drawing 22177/Locs.

Positions were in general accordance with Section 7 of BSD10175, in that the sample points in the western are were at spacings of less than 20m, with a targeted 10m sopacing in the eastern zone, along the line of the historic railway sidings.

100% water flush returns were noted by the driller during the rotary probing. On completion BH03 was installed a 50mm standpipe and bentonite grout, with no excessive take. BH04 was grouted.

Borehole logs are shown in Appendix B. The results of previous ground investigations are appended for additional augmentive information.

# 5.0 SITE CONDITIONS ENCOUNTERED

## 5.1 Ground Conditions

During both ground investigations, a generalised succession as was noted, indicated in Table 5.1.

| Stratum | Depth to base (m) | Remarks |
|---|---|---|
| MADE GROUND | 0.30 to 0.80 | Deepest at TP09. Mostly demolition materials. |
| Stiff CLAY | 0.70 to 2.90 | Glacial Till. Absent in the east of the site. |
| GRAVEL | (1.20) | SA01 only |
| MUDSTONE | (30.00) | |
| BH03 Coal | 24.80 – 25.00 | |
| BH04 Coal | 22.20 – 22.50 | |

**Table 5.1. Generalised Strata**

Made Ground was relatively thin across the site (0.30m to 0.80) and predominantly of demolition materials – presumably derived from the previous modern building at site.

The Glacial Tills were mainly CLAYs. These feathered out to nothing towards the east of the site, where bedrock was noted directly beneath the Made Ground.

Bedrock was noted within the boreholes, and trial pits in the eastern parts of the site. Coals were noted at 22.20m and 24.80m depths, being solid and between 200mm and 300mm thick.

There was no visual or olfactory evidence of contaminatuion.

## 5.2 Groundwater Conditions

Water strikes were noted at 1.50m as a seepage at SA01 and between 11.20m and 15.00m at BH03 and 04. Post site monitoring has noted groundwater levels in the standpipes within the upper 1.50m.

It should be noted that groundwater levels vary due to changes in climatic and other conditions and may therefore vary from those recorded during these operations.

## 5.3 Soakaway Testing

None of the soakaway testing produced an appropriate infiltration rate (If), as the ground was relatively impermeable. The results are appended.

Thus, the values are not considered to be suitable for soakaway drainage solutions.

This also indicates low risk of transmission of contaminants through the superficial deposits.

# 6.0 LABORATORY TESTING

Chemical laboratory testing was conducted to determine the concentrations of the following. As the Aquifers were undifferentiated and Secondary, and soakaway values were not suitable, leachate testing was not undertaken, as determined in the Phase 1 report.

- Metals
- Asbestos
- pH and SO4
- PAH MS
- TPH CWG with cleanup
- BTEX
- Soil Leachate Testing
- Groundwater Chemical Testing
- WAC E 1 stage

Chemical soil analysis was undertaken on 15 soil samples locations across the site in broad accordance with the DOE Industrial Profile for “Railway Land”. Samples were taken, both at the area of historic railway sidings and to the west and east of those. Testing was undertaken on both Made Ground and natural strata. A groundwater sample was recovered from BH03, and tested for a broad suite of chemicals. The results are appended.

# 7.0 GEOTECHNICAL PARAMETERS

## 7.1 Introduction

This section presents geotechnical parameters, which will be taken forward into the foundation options appraisals, and assigns parameters to the strata encountered. We have chosen not to assess geotechnical parameters of the Made Ground, as it is variable both laterally and vertically.

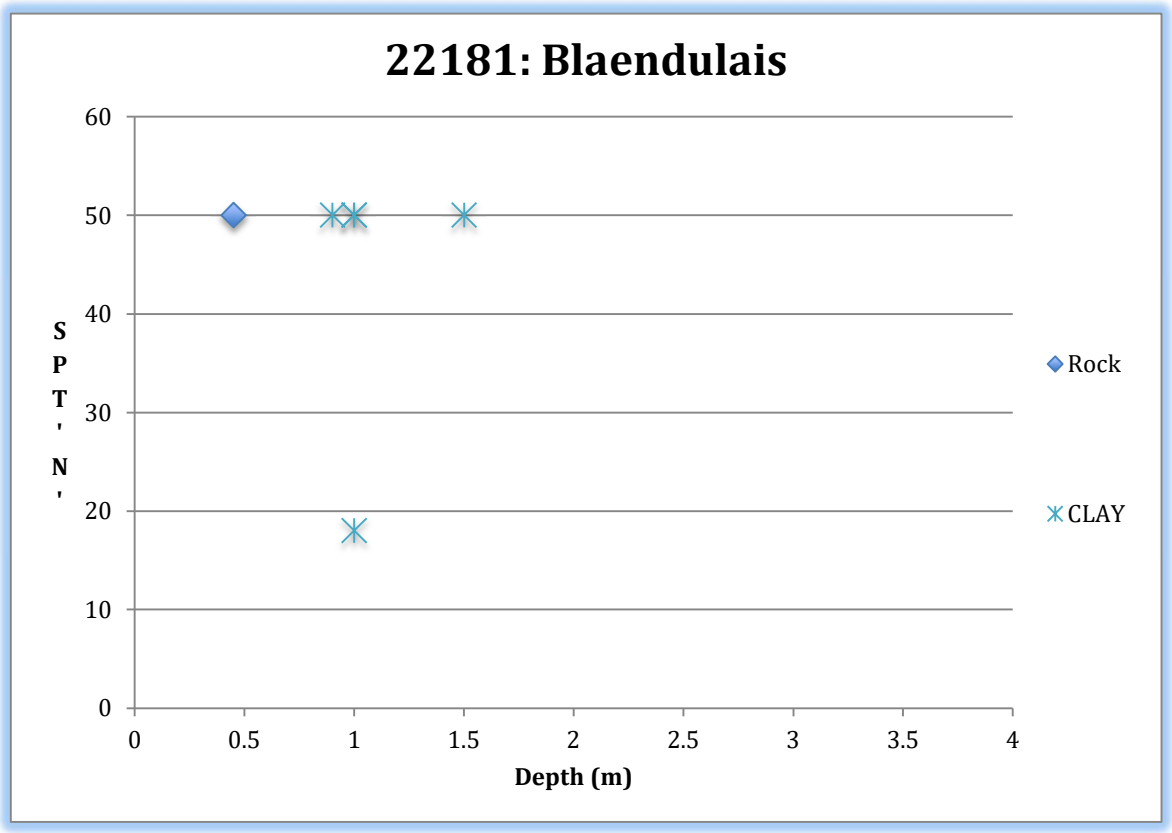



***Figure 7.1. SPT N vs Depth***

### 8.1.1 Stiff CLAY

What has been described as stiff gravelly CLAY, was noted beneath the Made Ground.

The upper surface was noted at depths of between 0.30m and 0.80m, below the Made Ground.

Uncorrected SPT N values of between 18 and refusal were recorded. Allowing for the effects of overburden and correcting accordingly suggests the strata to be stiff.

Employing correlations developed by Stroud et al, the following is recommended.

- *Undrained Shear Strength ($c_u$) – 100kN/m$^2$*
- *Coefficient of Volume Compressibility ($m_v$) – 0.09m$^2$/MN*

## 8.0 GEOTECHNICAL ASSESSMENT

### 8.1 Introduction

The following sections provide an assessment of the options relating to foundation options at site, making suggestions relating to potential options/assessment for bearing capacity and foundations and attack to buried concrete.

### 8.2 Foundation Options

At a depth of 1.00m to 1.50m the CLAY would provide an allowable bearing capacity ($q_a$) in the order of 100kN/m$^2$, however care must be taken to inspect the stratum for loose or waterlogged zones.

It should be noted that the upper surface of the weathered rock was noted at shallow depth in several exploratory holes, as shallow as 0.70m in TP05. Thus, there may be need to employ breakers to accomplish excavations for foundations and services.

Excavations in the Made Ground will degrade in wet conditions, and thus close support should be considered. Water was monitored as shallow as 1.50m depth, thus this may affect excavation depths. It is recommended that pumping from open sump is allowed for.

All formations must be inspected by a professional Geotechnical Engineer to confirm that the materials will accommodate the allowable bearing capacity calculated, and so that soft spots are identified, and removed.

## 8.3 Attack to Buried Concrete

Laboratory testing during, noted slightly acid to alkaline pH values, and a maximum water soluble sulphate value of 0.19g/l, indicating Sulphate Class DS-1, in accordance with BRE Special Digest 1.

## 8.4 Groundwater

Groundwater was monitored at around 1.50m at it's shallowest.

It is prudent to assume that there may be perched tables or standing water during periods of rainfall. Thus, pumping from open sumps should be accommodated for.

It should be noted that groundwater levels vary due to changes in climatic and other conditions and may therefore at times vary from those recorded during these operations.

## 9.0 CONTAMINATION TESTING

Contamination testing was undertaken on fifteen soil samples, as shown in the Appendices.

| **Client Sample ID** | **Units** | TP01 | TP01a | TP03 | WS02 | WS03 | TP05 | TP05 | TP06 | TP06 | TP07 | TP7a | TP08 | TP09 | TP10 | TP10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth to Top** | | 0.60 | 0.00 | 0.30 | 0.30 | 0.40 | 0.30 | 0.90 | 0.30 | 0.90 | 0.50 | 0.00 | 0.50 | 0.50 | 0.40 | 1.00 | |
| **Depth to Bottom** | | | 0.50 | | | | | | | | | 0.50 | | | | | |
| **Sample Type** | | Soil - ES | Leach | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Leach | Soil - ES | Soil - ES | Soil - ES | Soil - ES | **POS Resi** |
| % Stones >10mm | % w/w | 13.1 | <0.1 | 12.7 | 13.9 | 3.6 | <0.1 | 33.6 | 11 | 22.4 | <0.1 | <0.1 | 39.7 | 26.4 | <0.1 | <0.1 | |
| pH | pH | 6.24 | 8.31 | 9.63 | 9.02 | 8.26 | 7.68 | 8.27 | 9.5 | 6.26 | 10.51 | 8.22 | 7.99 | 8.86 | 7.68 | 7.28 | |
| Sulphate (water sol 2:1) | g/l | 0.04 | 0.01 | 0.19 | 0.07 | <0.01 | <0.01 | 0.03 | 0.33 | 0.21 | 0.01 | <0.01 | <0.01 | 0.04 | 0.02 | <0.01 | |
| Organic matter | % w/w | 2.1 | 2.22 | 0.4 | 6.2 | 96.4 | 1.96 | 8.92 | 10.6 | 2.07 | 16.8 | 1.11 | 45.7 | 6.06 | 57.2 | 3.6 | |
| Arsenic | mg/kg | 3 | 5 | 26 | 15 | 5 | 10 | 124 | 23 | 2 | 27 | 5 | 12 | 37 | 33 | 6 | 79 |
| Boron (water soluble) | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 3.2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 21000 |
| Cadmium | mg/kg | <0.5 | <0.5 | <0.5 | 1.3 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1.1 | <0.5 | 120 |
| Copper | mg/kg | 16 | 24 | 49 | 65 | 53 | 14 | 119 | 53 | 16 | 73 | 23 | 45 | 68 | 211 | 30 | 12000 |
| Chromium | mg/kg | 12 | 13 | 14 | 13 | 6 | 16 | 8 | 16 | 9 | 225 | 15 | 7 | 10 | 13 | 12 | 1500 |
| Chromium Hex | mg/kg | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 7.7 |
| Lead | mg/kg | 11 | 14 | 33 | 38 | 32 | 20 | 61 | 45 | 14 | 41 | 15 | 36 | 32 | 422 | 28 | 630 |
| Mercury | mg/kg | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | 0.5 | <0.17 | 120 |
| Nickel | mg/kg | 14 | 25 | 23 | 26 | 9 | 12 | 12 | 18 | 12 | 26 | 26 | 17 | 14 | 31 | 26 | 230 |
| Selenium | mg/kg | <1 | <1 | <1 | <1 | <1 | <1 | 1 | <1 | <1 | 3 | <1 | <1 | <1 | <1 | <1 | 1100 |
| Zinc | mg/kg | 31 | 59 | 126 | 2990 | 75 | 45 | 181 | 165 | 32 | 129 | 58 | 69 | 106 | 389 | 67 | 8100 |
| TPH total (>C6-C40) | mg/kg | 528 | <10 | 87 | 99 | 60 | <10 | 20 | 284 | <10 | 84 | <10 | 26 | 78 | 158 | <10 | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | | | | | | | | |
| Asbestos in soil | | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | |
| Asbestos ACM - Suitable for Water Absorption Test? | | N/A | NAD | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Not Detected |

***Table 9.1a,b and c: Soil Contamination Results***

| PAH-16MS | | | | | | | | | | | | | | | | | S4UL/ C4SL Resi Without 2.5% SOM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | mg/kg | 0.01 | <0.01 | <0.01 | 0.01 | 0.06 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | 0.05 | <0.01 | 15000 |
| Acenaphthylene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | 0.03 | <0.01 | 15000 |
| Anthracene | mg/kg | 0.02 | <0.02 | <0.02 | <0.02 | 0.07 | <0.02 | 0.02 | <0.02 | <0.02 | 0.03 | <0.02 | <0.02 | <0.02 | 0.11 | <0.02 | 74000 |
| Benzo(a)anthracene | mg/kg | <0.04 | <0.04 | 0.09 | 0.11 | 0.14 | <0.04 | 0.23 | <0.04 | <0.04 | 0.09 | <0.04 | 0.04 | <0.04 | 0.48 | <0.04 | 29 |
| Benzo(a)pyrene | mg/kg | <0.04 | <0.04 | 0.08 | 0.09 | 0.07 | <0.04 | 0.17 | <0.04 | <0.04 | 0.06 | <0.04 | <0.04 | <0.04 | 0.37 | <0.04 | 5.7 |
| Benzo(b)fluoranthene | mg/kg | <0.05 | <0.05 | 0.16 | 0.18 | 0.29 | <0.05 | 0.26 | <0.05 | <0.05 | 0.14 | <0.05 | 0.07 | <0.05 | 0.68 | <0.05 | 7.2 |
| Benzo(ghi)perylene | mg/kg | <0.05 | <0.05 | 0.07 | 0.08 | <0.05 | <0.05 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.22 | <0.05 | 640 |
| Benzo(k)fluoranthene | mg/kg | <0.07 | <0.07 | <0.07 | <0.07 | 0.09 | <0.07 | 0.09 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | 0.23 | <0.07 | 190 |
| Chrysene | mg/kg | <0.06 | <0.06 | 0.14 | 0.16 | 0.29 | <0.06 | 0.26 | <0.06 | <0.06 | 0.14 | <0.06 | 0.06 | <0.06 | 0.78 | <0.06 | 57 |
| Dibenzo(ah)anthracene | mg/kg | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.08 | <0.04 | 0.57 |
| Fluoranthene | mg/kg | <0.08 | <0.08 | 0.19 | 0.2 | 0.57 | <0.08 | 0.38 | <0.08 | <0.08 | 0.19 | <0.08 | 0.08 | <0.08 | 1.27 | <0.08 | 3100 |
| Fluorene | mg/kg | 0.04 | <0.01 | <0.01 | <0.01 | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | 0.04 | <0.01 | 9900 |
| Indeno(123-cd)pyrene | mg/kg | <0.03 | <0.03 | 0.08 | 0.09 | 0.06 | <0.03 | 0.11 | <0.03 | <0.03 | 0.04 | <0.03 | 0.03 | <0.03 | 0.25 | <0.03 | 82 |
| Naphthalene | mg/kg | <0.03 | <0.03 | <0.03 | 0.03 | 0.12 | <0.03 | <0.03 | <0.03 | <0.03 | 0.04 | <0.03 | <0.03 | <0.03 | 0.16 | <0.03 | 4900 |
| Phenanthrene | mg/kg | <0.03 | <0.03 | 0.15 | 0.15 | 0.71 | <0.03 | 0.11 | 0.04 | <0.03 | 0.16 | <0.03 | 0.07 | <0.03 | 0.74 | <0.03 | 3100 |
| Pyrene | mg/kg | <0.07 | <0.07 | 0.13 | 0.16 | 0.27 | <0.07 | 0.29 | <0.07 | <0.07 | 0.14 | <0.07 | <0.07 | <0.07 | 0.9 | <0.07 | 7400 |
| Total PAH-16MS | mg/kg | 0.08 | <0.08 | 1.09 | 1.26 | 2.77 | <0.08 | 2.02 | <0.08 | <0.08 | 1.06 | <0.08 | 0.35 | <0.08 | 6.39 | <0.08 | 133411 |

| TPH CWG with Clean Up | | | Leachable | | | | | | | | | Leachable | | | | | Residential Without Plant Uptake 2.5% SOM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ali >C5-C6 | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 53 |
| Ali >C6-C8 | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 160 |
| Ali >C8-C10 | mg/kg | | <10 | | | | <1 | <1 | <1 | <1 | <1 | <10 | <1 | <1 | <1 | <1 | 44 |
| Ali >C10-C12 | mg/kg | | <10 | | | | <1 | <1 | <1 | <1 | 1 | <10 | <1 | <1 | <1 | <1 | 220 |
| Ali >C12-C16 | mg/kg | | <10 | | | | <1 | <1 | 1 | <1 | 6 | <10 | 1 | 3 | 3 | <1 | 1600 |
| Ali >C16-C21 | mg/kg | | <10 | | | | <1 | <1 | 3 | <1 | 8 | <10 | 4 | 5 | 8 | <1 | 64000 |
| Ali >C21-C35 | mg/kg | | <20 | | | | <1 | 7 | 48 | <1 | 23 | <20 | 67 | 114 | 61 | 1 | |
| Total Aliphatics | mg/kg | | <20 | | | | <1 | 8 | 53 | <1 | 38 | <20 | 73 | 122 | 72 | 1 | 66077 |
| Aro >C5-C7 | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 0.21 |
| Aro >C7-C8 | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 1290 |
| Aro >C8-C10 | mg/kg | | <10 | | | | <1 | <1 | <1 | <1 | <1 | <10 | <1 | <1 | <1 | <1 | 78 |
| Aro >C10-C12 | mg/kg | | <10 | | | | <1 | <1 | 1 | <1 | 1 | <10 | <1 | <1 | 1 | <1 | 400 |
| Aro >C12-C16 | mg/kg | | <10 | | | | <1 | <1 | 2 | <1 | 6 | <10 | 2 | 3 | 7 | <1 | 1600 |
| Aro >C16-C21 | mg/kg | | <10 | | | | <1 | 2 | 5 | <1 | 10 | <10 | 7 | 7 | 33 | <1 | 1300 |
| Aro >C21-C35 | mg/kg | | <20 | | | | <1 | 8 | 16 | <1 | 9 | <20 | 7 | 22 | 113 | <1 | 1300 |
| Total Aromatics | mg/kg | | <20 | | | | <1 | 11 | 24 | <1 | 26 | <20 | 15 | 33 | 154 | <1 | 5968.21 |
| TPH (Ali & Aro >C5-C35) | mg/kg | | <20 | | | | <1 | 19 | 77 | <1 | 64 | <20 | 88 | 154 | 227 | 1 | 72045.21 |
| BTEX - Benzene | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 0.21 |
| BTEX - Toluene | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 570 |
| BTEX - Ethyl Benzene | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 160 |
| BTEX - m & p Xylene | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 52 |
| BTEX - o Xylene | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | |
| MTBE | mg/kg | | <1 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <1 | <0.01 | <0.01 | <0.10 | <0.01 | 48 |

| Client Sample ID | | BH03 | | |
|---|---|---|---|---|
| Date Sampled | | 22/05/25 | | |
| Sample Type | | Water-GW | | |
| Sample Matrix Code | | N/A | EAL | Source |
| pH (w) | pH | 7.71 | | |
| Sulphate (w) | mg/l | 11 | | |
| Cyanide (total) (w) | mg/l | <0.005 | 0.05 | |
| Phenols - Total by HPLC (w) | mg/l | <0.01 | 0.0005 | |
| DOC (w) | mg/l | <2.0 | | |
| Arsenic (dissolved) | µg/l | <1 | | |
| Copper (dissolved) | µg/l | <4 | | |
| Chromium (dissolved) | µg/l | <1 | | |
| Lead (dissolved) | µg/l | <1 | | |
| Mercury (dissolved) | µg/l | <0.1 | | |
| Nickel (dissolved) | µg/l | <2 | | |
| **PAH 16MS (w)** | | | | |
| Acenaphthene (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| Acenaphthylene (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| Anthracene (w) | µg/l | <0.01 | | |
| Benzo(a)anthracene (w) | µg/l | <0.01 | | |
| Benzo(a)pyrene (w) | µg/l | <0.01 | | |
| Benzo(b)fluoranthene (w) | µg/l | <0.01 | | |
| Benzo(ghi)perylene (w) | µg/l | <0.01 | | |
| Benzo(k)fluoranthene (w) | µg/l | <0.01 | | |
| Chrysene (w) | µg/l | <0.01 | | |
| Dibenzo(ah)anthracene (w) | µg/l | <0.01 | | |
| Fluoranthene (w) | µg/l | <0.01 | | |
| Fluorene (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| Indeno(123-cd)pyrene (w) | µg/l | <0.01 | | |
| Naphthalene (w) | µg/l | <0.01 | 10 | UK EQS Fresh |
| Phenanthrene (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| Pyrene (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| Total PAH 16MS (w) | µg/l | <0.01 | 0.1 | UK Drinking |
| **TPH CWG (w)** | | | | |
| Ali >C5-C6 (w) | µg/l | <1 | | |
| Ali >C6-C8 (w) | µg/l | <1 | 10 | UK Drinking |
| Ali >C8-C10 (w) | µg/l | <5 | 10 | UK Drinking |
| Ali >C10-C12 (w) | µg/l | <5 | 10 | |
| Ali >C12-C16 (w) | µg/l | <5 | | |
| Ali >C16-C21 (w) | µg/l | <5 | | |
| Ali >C21-C35 (w) | µg/l | <5 | | |
| Total Aliphatics (w) | µg/l | <5 | 10 | UK Drinking |
| Aro >C5-C7 (w) | µg/l | <1 | 10 | UK Drinking |
| Aro >C7-C8 (w) | µg/l | <1 | 10 | UK Drinking |
| Aro >C8-C10 (w) | µg/l | <5 | 10 | UK Drinking |
| Aro >C10-C12 (w) | µg/l | <5 | 10 | UK Drinking |
| Aro >C12-C16 (w) | µg/l | <5 | 10 | UK Drinking |
| Aro >C16-C21 (w) | µg/l | <5 | 10 | UK Drinking |
| Aro >C21-C35 (w) | µg/l | <10 | 10 | UK Drinking |

| | | | | |
|---|---|---|---|---|
| Total Aromatics (w) | µg/l | <10 | 10 | UK Drinking |
| TPH (Ali & Aro >C5-C35) (w) | µg/l | <10 | 10 | UK Drinking |
| BTEX - Benzene (w) | µg/l | <1 | | |
| BTEX - Toluene (w) | µg/l | <1 | | |
| BTEX - Ethyl Benzene (w) | µg/l | <1 | | |
| BTEX - m & p Xylene (w) | µg/l | <1 | | |
| BTEX - o Xylene (w) | µg/l | <1 | | |
| MTBE (w) | µg/l | <1 | | |

***Table 9.1d: Groundwater Test Results***

The soil test results have been compared with current Environment Agency limits for POSResi Uses. Tables 9.1a, b and c show the recorded values, related to current Soil Guideline Values (SGVs)/S4UL, or other published values. 2.5% SOM has been employed as the average Organic Content.

Thus, it is evident that most positions were within guidelines for POSResi, with one exceedance at TP05 (124 mg/kg), where arsenic exceeded the POSResi guideline value of 79 mg/kg. With the location of TP05 being under proposed tarmac hardstanding, it is suggested that the single value (mean As being 20mg/kg), requires no further assessment.

Asbestos containing materials were not encountered.

Waste Acceptance Criteria (WAC) Testing was undertaken on a single sample from WS04. No values exceeded inert landfill levels. It is likely that under the contractors Material Management Plans, further testing will be required for materials being removed from site.

A chemical water suite was undertaken on a sample of Groundwater taken from BH03. Where possible, the recorded values have been compared with UK Drinking water Standards, which are considered stringent. No values exceeded the standards. This, together with the fact that all test results are below limits od detection, suggests that there is no leaching of historic contaminants into the ground water.

## 10.0 COAL MINING RISK ASSESSMENT

At the time of writing the report, SGS were aware that the proposed development will include the development of a childcare unit (single storey) which will include hard standing areas for car parking and a bin store.

All information collated on ground conditions is based on extrapolation from data available on adjacent sites and from literature sources. In summary, the following data sources have been consulted.

- *Coal Authority Interactive Map Viewer 2024*
- *British Geological Survey (BGS) Sheet No. 247 (Swansea) Solid and Drift Edition, 1:50 000 and 1:10,560 scale;*
- *SGS Phase 1 Desk Study (report number 22181_R2) · Consultants Coal Mining Report*
- *British Geological Survey Geoindex Online Mapping*
- *British Geological Survey Borehole Database, comprising borehole logs of shafts and borehole records adjacent to the site.*
- *Records of borehole drilled on site.*

### 10.1 BGS and Coal Authority Report Summary

The Coal Authority Consultants Report (Appended) states the following:

- Four coal seams lie beneath the property at a shallow depth to 150m depth and were last worked in 1944. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now. In addition, the property is in an area where the Coal Authority believe there is coal at or close to the surface.
- The property also lies within in a surface area that could be affected by underground mining an outcrop seam of coal (Gorllywn).
- The Coal Authority believe that there are not probable unrecorded shallow workings on the site.
- Spine roadways have not been recorded at shallow depth.
- The site is not within influencing distance of current mining activity and the Coal Authority has no plans to grant licenses in the area relating to underground mining. However, reserves of coal exist in the local area which could be worked at some time in the future.
- There are no mine entries recorded within 100metres of the site boundary.
- The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that may have been affected by coal mining.
- The site is not within a boundary of an opencast site from which coal has been removed by opencast methods.

- The property does not lie within 500 metres of the boundary of an opencast site from which coal is being removed by opencast methods and there are no licenses to remove coal by opencast method within.
- The Coal Authority has not received a damage notice or claim for the subject property or any property within 50m of the site since 31st October 1994.
- The Coal Authority has no record of a mine gas emission requiring action within 500m of the enquiry boundary.
- The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.
- The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.
- No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
- The property is not in an area where a notice to withdraw support. 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.

The Coal Authority interactive maps were consulted prior to the investigation and show the site to lie within a development high risk area.. The Coal Authority Report identified the following Coal Seams:

· *Gorwllyn Coal Seam being present below the site, outcropping 36°. The dip direction of the outcrop and the thickness is not detailed within the report.*

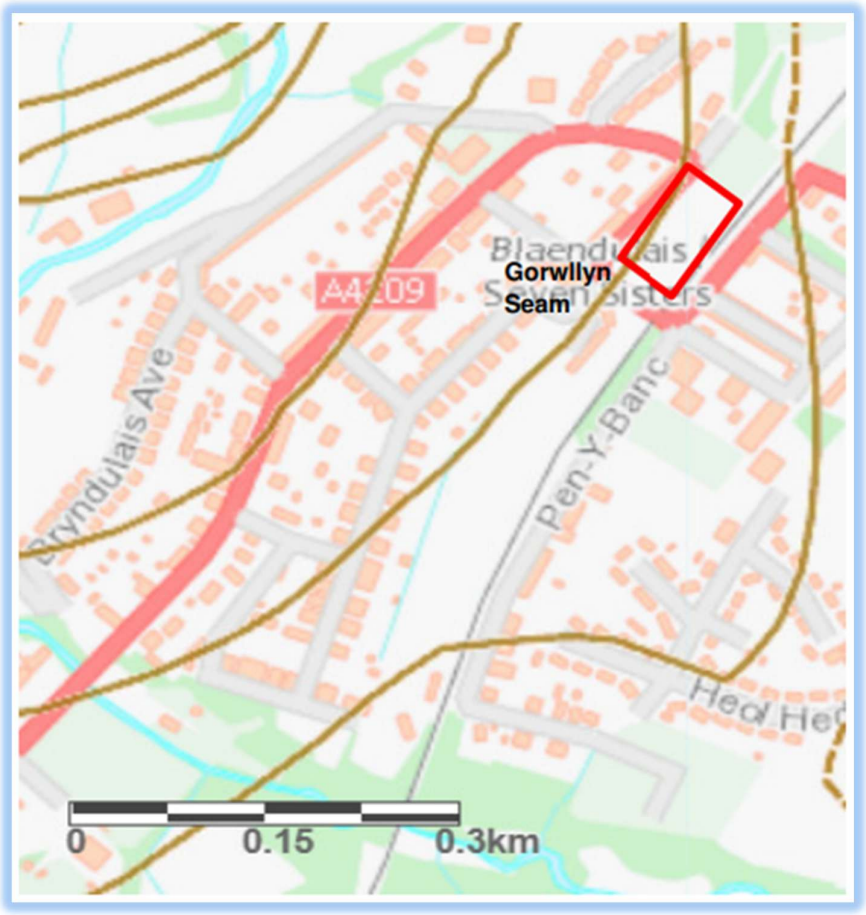



***Fig 10: Geoindex Extract***

Given the probable presence of shallow outcropping seam at the site, deep boreholes were undertaken as part of the investigation.

## 10.1 Risk Assessment and Mitigation Strategy

The two boreholes during this phase noted a thin coal (200mm to 300mm thick) at 22m to 25m depths. No workings were noted and no loss of flush recorded in any of the holes.

Table 10-1 summarises the key hazards identified by review of the available data sources, the factors affecting risk posed by each hazard and an assessment of the estimated risk proposed to any redevelopment of the site.

Assessing risks from coal mining is based upon guidance provided by the Coal Authority following a 'risk based' approach implemented through PPG 14 – Development on Unstable Land.

The risk posed has been assessed as one of three categories.

| | |
|---|---|
| High Risk | Based upon the data available there is a significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures likely to be required. |
| Moderate Risk | Based upon the data available there is a potentially significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures may be required. |
| Low Risk | Based upon the data available there is a low risk of shallow ground instability associated with coal mining. No further assessment or investigation is recommended. |

***Table 10.1 Coal Mining Risk Categories***

The table below summarises the potential risks associated with coal mining legacy at the site.

| Coal Mining Legacy | Yes | No | Risk Assessment |
|---|---|---|---|
| Underground coal and ironstone mining (recorded) | x | | Required |
| Shallow (<30m) underground coal and ironstone mining (recorded) | | x | Required |
| Underground coal and ironstone mining (unrecorded) | x | | Required |
| Shallow (<30m) underground coal and ironstone mining (unrecorded) | x | | Required |
| Recorded Mine entries (Shafts and adits) | | x | Required |
| Coal and ironstone mining geology | x | | Required |
| Record of previous mine gas emissions | | x | Not Required |
| Record of coal mining surface hazard | | x | Not Required |
| Surface mining (recorded/unrecorded) | | x | Not Required |

This, combined with the knowledge that there was no flush take during the drilling, indicates that there are no workings within these seams, which would anyway, by their dimensions, likely to be non-economic for deep mining.

Thus, it is considered that no further investigation is required, and that no ground stabilisation is required for the development.

Based on the information obtained from this assessment, the following risk assessment has been compiled which identifies plausible risks at the site that require mitigation in the context of the proposed end use.

| Hazard | Area Affected | Factors Affecting Risk | Risk Estimate | Mitigation Recommendation | Risk Estimate Post Recommendation |
|---|---|---|---|---|---|
| Collapse of workings (Recorded and unrecorded) shallow Coals <30m<br><br>Coal Mining Seams | Entire Site | The Coal Authority believes that there is potential for coal at or close to the surface which may have been worked in the past from shallow depths (<30m). The CA recommends that the potential for such should be considered prior to the development. The site is Located on an outcrop of the Gorllwyn Seam.<br><br>The Coal Authority Interactive Mapping shows a high risk development area, directly related to the Gorllwyn Seam outcrop. | Moderate | Drilling of 2 Rotary boreholes to 30m, to confirm the Gorllwyn seam. Thisn coals 200mm and 300mm, were noted in the boreholes.No evidence of workings and too this to be economically viable.<br><br>No further mitigation necessary. | Low |
| Collapse of workings (recorded and unrecorded) deep coal and ironstone seams. | Entire Site | The property is in a surface area that could be affected by underground mining of four seams from shallow (<30m) to 150m<br>depth. | High | Coal seams are present beneath the site. Boreholes drilled to 30m bgl identified thin (>10) coal seams at shallow depth but did not identify any workings or voids. Deeper coal seams, even if worked, are unlikely to impact the surface.<br><br>No further mitigation necessary | Low |

The risk assessment indicates that there is a **Low Risk** of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site.

There are no recorded mine entries within 100m of the site boundary.

The Consultants Coal Mining Report indicates that the site is within an area of historical coal mining activity. If ground conditions encountered during development appear different to what is present herein, then a specialist should be contacted.

The Gorllwyn Seam was potentially identified in both boreholes (BH03 and BH04) and were found not to be worked.

No further mitigation is deemed necessary.

# 11.0 PRELIMINARY GROUND GAS RISK ASSESSMENT

## 11.1 Introduction

To develop as wide an understanding of the ground gas regime, SGS have taken gas monitoring data by TetraTech at the adjacent site, to augment the findings of the SGS monitoring, which was undertaken on site, and within the TetraTech monitoring wells. It is considered that this gives a site wide picture of the ground gas regime.

7No ground gas monitoring visits have been undertaken by TetraTech and SGS, between 02 June 2022 and 19 February 2025. The monitoring data is appended.

## 11.2 Ground Gas Monitoring

Ground gases are monitored within boreholes at the site, and adjacent to it, recording the following:

- Concentrations of ground gases;
  - *Methane (%v/v);*
  - *Carbon dioxide (%v/v);*
  - *Oxygen (%v/v);*
  - *Carbon monoxide (ppm);*
  - *Hydrogen sulphide (ppm);*
- Borehole flow rate (l/hr);
- Depth to groundwater;
- Atmospheric pressure trends;

Where groundwater levels are noted to be above the screened sections of the boreholes the data is not considered to be representative of the ground gas regime and are therefore not used within the risk assessment process.

Atmospheric pressure trends are recorded on site during the monitoring process, but are also noted in the preceding three days, and one day after each monitoring

visit. Falls in atmospheric pressure are generally considered to indicate a higher potential for ground gas migration from the sub surface and as such monitoring during periods of falling pressure are considered to represent worst case scenarios as outlined in the CL:AIRE Technical Bulletin TB17 (CL:AIRE, August 2018).

## 11.3 Land and Mine Gas Risk Assessment Methodology

The key reference document which has been used to undertake the semi-quantitative land gas assessment presented in this report is CIRIA C665 (CIRIA, 2007). This provides a framework for assessment of land gas risk to buildings/structures with foundations (i.e. houses and/or commercial properties).

The risk assessment process is based on a Source-Pathway-Receptor Conceptual Site Model Methodology, with consideration given to the potential sources likely to be present on the site and the ground gas monitoring regime designed to reflect the scale of the source potential.

In accordance with CL:AIRE, 2021, Good practice for risk assessment for coal mine gas emissions, an assessment of the risk due to mining legacy is presented in Table 11. The site is within a Coal Mining Reporting area. The Consultancy Report notes the shallowest worked coal to be the Seven Sisters, at a depth of 146m, being only 100cm thick. Thus, it is suggested that this does not infact pose a risk which we then propose places the site in Step 2.

| STEP | QUALIFIER | OUTCOME | COMMENT |
|---|---|---|---|
| 1 | Site within a coal authority defined coal mining reporting area? | Yes | Go to step 2 |
| **2** | Are all these statements true? Mine entries >50m from site boundary. Workings >150m depth.<br><br>No faults or other potential pathways connecting surface to deeper unflooded workings.<br><br>Outside area of past or probable shallow workings on coal authority viewer | Yes | Low Risk |
| **3** | Are all these statements true? Workings between 30m and 150m but permanently flooded or covered by 10m+ of low permeable superficial deposits.<br><br>Mine entries > 50m from site boundary. Low permeability superficial deposits of sufficient thickness – <1x10-4m/s hydraulic conductivity | NO | |
| **4** | Are any of these statements true? Mine entries on site or <20m from site boundary.<br>Workings below site <30m depth and unflooded or variable water level.<br>Faults or other pathways connecting surface to deeper unflooded workings.<br>Within area of past or probable shallow workings on Coal Authority Viewer. | No | |

***Table 11: Ground Gas Decision Tool***

It is determined the site is at low risk of mine gas thus not requiring a detailed mine gas risk assessment to establish whether suitable mitigation measures can be incorporated into the development.

Due to the low risk from mine gas, following completion of drilling works, a ground gas well was installed and monitored with response zone positioned within the unsaturated zone. The ground gas monitoring results and groundwater level monitoring results are used to inform a mine gas risk assessment in accordance with CL:AIRE, 2021, Good practice for risk assessment for coal mine gas emissions.

The collected data has been used for the purposes of undertaking a semi-quantitative assessment in accordance with the CIRIA 665 methodology. The calculation used to calculate the gas screening value (GSV) for the site, together with the relevant definition of units, is as follows:

*GSV (litres of gas/hr) = borehole flow rate (l/hr) x gas concentration (volume/100)*

The calculated GSV values are used to determine the Characteristic Situation (CS) for the site in terms of methane and carbon dioxide, based on the conditions outlined in Table 11-1 below.

CS classification is applicable to all buildings, with the exception of low-rise housing with a ventilated underfloor void, in these situations, the NHBC Traffic Light System is adopted. Based on the proposed development, the CS classification is considered the most appropriate.

| Characteristic Situation | Risk Classification | Gas Screening Value Threshold (l/hr) | Additional Considerations |
|---|---|---|---|
| 1 | Very Low Risk | <0.07 | Methane concentration <1% Carbon dioxide <5% |
| 2 | Low Risk | <0.7 | Borehole flow rate <70 l/hr |
| 3 | Moderate Risk | <3.5 | - |
| 4 | Moderate to High Risk | <15 | Quantitative risk assessment required to evaluate scope of protective measures |
| 5 | High Risk | <70 | - |
| 6 | Very High Risk | >70 | - |

***Table 11.1: GSV Classification (Modified Wilson and Card Methodology)***

## 11.4 Conceptual Site Model

The following sections outline the anticipated Source-Pathway- Receptor model associated with the proposed development on site.

### Sources

The following potential sources have been identified on and off site.

• Made Ground deposits

• The site is also located within the South Wales Coalfield, with historical mine workings within the vicinity of the site.

### Pathways

The following potential pathways have been identified which may act as preferential pathways for ground gas migration:

• The underlying strata have been classified as largely low permeability. Therefore, there is limited potential for horizontal and vertical migration of ground gas;

• Buried service runs and foundations, including sub-floor voids.

**Receptors**

Within the context of ground gases, the following enclosed structures are considered to represent potential receptors.

• Structures and enclosed areas within proposed development.

## 11.5 Risk Assessment – Methane and Carbon Dioxide

In order to assess the significance of ground gases at the site, measured concentrations and flow rates have been used to derive Gas Screening Values (GSVs). GSVs are the product of gas concentration and gas flow measured in a borehole and provide an indication of the flow of the particular gas in question out of the ground.

Based on a maximum flow recorded of 0.3l/hr and the maximum recorded concentration of carbon dioxide ($CO_2$) and methane ($CH_4$) during the monitoring visits, the GSVs have been calculated as presented in Table 11.5.

| Gas | Maximum Concentration (%) | Maximum Flow Rate (l/hr) | GSV (l/hr) | Characteristic Situation (Wilson and Card) |
|---|---|---|---|---|
| Carbon Dioxide | 0.5 | 0.3 | $1.5x10^{-3}$ | 1 (Very Low Risk) |
| Methane | 0.1 | 0.3 | $3x10^{-4}$ | 1 (Very Low Risk) |

***Table 11.5. Initial GSV Calculations***

## 11.6 Carbon Monoxide and Hydrogen Sulphide

Maximum concentrations of carbon monoxide and hydrogen sulphide were recorded at <1ppm throughout the monitoring period. The recorded concentrations are considered to be suitably low to negate the requirement for additional risk assessment.

## 11.7 Atmospheric Pressure Trends

The monitoring rounds was undertaken during rising, falling and steady pressures with no discernable variation in ground gas monitoring results recorded. The second monitoring round was undertaken following a period of falling pressure.

## 11.8 Summary and Discussion

The site has been classified as Characteristic Situation 1 (Very Low Risk) based on the worst-case recorded concentrations of carbon dioxide and methane and maximum flow rates. Site classification of a Characteristic Situation 1 indicates gas protection measures are not required within new developments.

## 12.0 REVISED CONCEPTUAL SITE MODEL

Table 12.1 provides the Revised CIRIA C552 Qualitative Risk Assessment, developed with the knowledge of the findings of the Phase 2 Ground Investigation. Risk categories are presented in accordance with R&D66:2008 Volume 1.

**Table 12.1: Revised Quantitative Environmental Risk Assessment for Identified sources of Contamination**

| Source | Potential contaminant (s) | Potential Pathway(s) | Potential receptor(s) | Assessment | Consequence | Potential Probability | Risk Class | Investigation Required |
|---|---|---|---|---|---|---|---|---|
| Site Soils/ Made Ground associated with previous development and railway sidings | Metals, PAHs, asbestos, $SO_4$, pH, TPH, BTEX | Ingestion, inhalation, dermal contact | Humans (residents & end users) | A single sight elevation of Arsenic was noted under an area of proposed tarmac hardstanding. The value did not exceed POSResi limits.. | Medium | Unlikely | Low | Undertaken |
| | | | Humans (site workers) | A single sight elevation of Arsenic was noted under an area of proposed tarmac hardstanding. The value did not exceed POSResi limits.. | Medium | Unlikely | Low | Undertaken |
| | | Direct contact, aggressive ground conditions, | Building fabric and services | Testing noted no elevations which would affect building fabric. | High | Unlikely | Low | Undertaken |
| | | Leaching, migration. | Surface water environment | There is no surface water at the site. The majority of proposed development is to consist of drained surfaces which will prevent surface water run-off from coming into contact with potentially contaminated made ground. Superficial aquifer is undifferentiated. Soakaway rates extremely low. | Medium | Unlikely | Low | Undertaken |
| | | | Groundwater environment – Superficial Groundwater | | | | | |
| | | | Groundwater environment – Bedrock Aquifer | The underlying bedrock is a Secondary (B) Aquifer – Low Permeability Layer | Medium | Unlikely | Low | Undertaken |

| Source | Potential contaminant (s) | Potential Pathway(s) | Potential receptor(s) | Assessment | Consequence | Potential Probability | Risk Class | Investigation Required |
|---|---|---|---|---|---|---|---|---|
| Demolition Materials | Asbestos | Inhalation | All site users | | Medium | Unlikely | Low | Undertaken |
| Coal Mining and Made Ground Ground Gas | $CH_4/CO_2/H_2S$ | Accumulation and inhalation | Construction workers<br><br>Future Site Users | Gas testing showed no deleterious concentrations. A CS1 situation has been calculated | Severe | Unlikely | Low | Undertaken |

## 13.0 ADDITIONAL COMMENTS

Reference may also be made to the Socotec Desk Top Study and Tetra Tech Geotechnical Interpretive reports as lines of evidence, which provide valuable information on the adjacent site conditions, which a broadly similar to the SGS findings. The recommendations given in these reports regarding foundation type, gas protection, made ground and potential hazardous materials should be considered, as ground conditions were consistent across the whole area.

Foundations are to be coordinated with any new or existing services and underground obstructions.

Any excavated material is to be WAC tested and WM3 assessed. Material that cannot be re-used for landscaping is to be removed off site for disposal at a suitable licenced facility.

# 14.0 CONCLUSIONS AND RECOMMENDATIONS

## 14.1 Summary

No particular ground contamination has been identified in the Made Ground or superficial deposits or groundwater at the site however given the conservative nature of the assessment and the understanding that the site will be largely hardstanding / formal surfacing the recorded concentrations are not considered to pose a significant risk to future site users. Risks to construction workers can be managed through the adoption of good hygiene practices and use of PPE during the development.

With regards to the potential for mobile contamination, a slightly elevated concentration of Arsenic was noted. However, given the limited find, the aggressive nature of the testing procedures and low permeability identified during the soil infiltration testing the recorded concentrations are not considered to pose a risk to controlled waters. The elevated value was at TP05, which is situated under a proposed are of tarmac hardstanding, thus no pathway exists to future site users.

Soil leachate and groundwater analysis indicated no contaminants of concern.

Asbestos containing materials have not been identified on the site or during subsequent laboratory testing.

Ground gas monitoring has identified low concentrations of ground gases in the sub surface such that the site has been classified as Characteristic Situation 1 (Very Low Risk), therefore no ground gas protection measures are deemed necessary within the proposed development.

An initial waste assessment has been undertaken. The results indicated that the sample has been classified as non-hazardous. This assessment is intended to provide an indicative assessment only. If materials are designated for off-site disposal during the development phase it is recommended that additional testing of the materials/area requiring disposal is undertaken to include WAC testing to identify a suitable receiving landfill facility.

Allowable bearing capacities have been provided for the natural strata encountered. The clays at site will need care during construction to ensure the formation is suitable for foundations. Formations, will need to be inspected for soft/loose spots and where those are found, treated accordingly. The granular strata will require care regarding trench stability.

Groundwater was noted as being within typical foundation depths, thus pumping from sumps and stabilization of excavations should be allowed for.

Soakaway values were extremely low. It may be worth undertaking further testing at depth within boreholes closer to the design stage.

Slightly acidic soil results were noted, and Sulphate Class DS-1, in accordance with BRE Special Digest 1 is recommended for buried concrete.

No specific Radon protection measures are considered necessary.

## 14.2 Recommendations

Based on the findings of the ground investigation, the following recommendations are outlined:

- A Reactive Strategy should be developed for the site to outline the requirements for identification, assessment and management of any areas of previously unidentified contamination encountered during the development phase;
- Movement of materials on the site should be undertaken in conjunction with a Materials Management Plan in line with the recommendations in the CL:AIRE Code of Practice to confirm any materials utilised on site are geotechnically and chemically suitable for re-use and to ensure all materials leaving site are disposed of at a suitable waste disposal facility;
- It remains the responsibility of the contractor as waste producer to classify any waste materials and identify a suitable off site disposal facility.

# Appendix A

## Drawings

| | |
|---|---|
| Borehole Location Plan | Drawing 22181_Locs |




Proposed Site Plan
1:200 @ A1

# Exploratory Hole Location Plan

## Key

- Trees to be felled
- Artificial Grass Surface
- Tarmac Surface
- Grass

KEY

- Probe Boreholes
- Dynamic Windowless Samples
- Trial Pits
- Soakaway Tests

| Rev. | Details | Date |
|---|---|---|
| B | DDA compliant Ramp added from RCA design, ground materials added | 21.08.23 |
| A | Building shifted 2750mm south-west to stay clear of existing banking, added topo, added blue line | 10.07.23 |

**Status:**
FEASIBILITY

**Project:**
Blaendulais – NPT Childcare Unit

**Client:**
Neath Port Talbot Council

**Title:**
Proposed Site Plan

| Drawing Number: | Rev. | Date Drawn: |
|---|---|---|
| 2454-002 | B | 03/03/23 |

| Scale: | Drawn by: |
|---|---|
| 1:200 | GRJ |

This drawing is the copyright of TRJ and may not be copied, altered, reproduced or passed to a third party without their consent.
Dimensions must be checked and verified on site, discrepancies should be reported.
THIS DRAWING SHOULD NOT BE SCALED

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Foundry Road, Ammanford,
Carmarthenshire, SA18 2LS.
Tel: 01269 591103 Fax: 01269 596207
Email: enquiries@trjltd.co.uk

## Appendix B

## Borehole Logs

TP01 to 10, 5a

SA01 to 03

BH03 and 04

WS01 to 04

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| TP01 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.60 - 0.90 | ES | | 0.50 | | | MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill. |
| | ▼ | | | | 1.50 | | | Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | | | | End of Borehole at 1.500m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| TP02 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | | | | MADE GROUND: Multicoloured angular to subangular COBBLES of sandstone, brick and concrete with a little sand and gravel. Gravel is angular to subangular fine to coarse of brick, sandstone and concrete. Fill. |
| | | | | | 0.40 | | | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |
| | | | | | 0.41 | | | End of Borehole at 0.400m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

spectrum geo services

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| TP03 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.30 - 0.60 | ES | | 0.60<br>0.61 | | | MADE GROUND: Multicoloured angular to subangular COBBLES of sandstone, brick and concrete with a little sand and gravel. Gravel is angular to subangular fine to coarse of brick, sandstone and concrete. Fill. |
| | | | | | | | | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |
| | | | | | | | | End of Borehole at 0.600m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| TP04 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | | | | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | | | | 0.40 | | | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |
| | | | | | 0.70 | | | End of Borehole at 0.700m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| TP05a | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | | | | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | | | | 0.30 | | | Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subrounded sandstone. Gravel is subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | 0.70 | | | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |
| | | | | | 0.71 | | | End of Borehole at 0.700m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

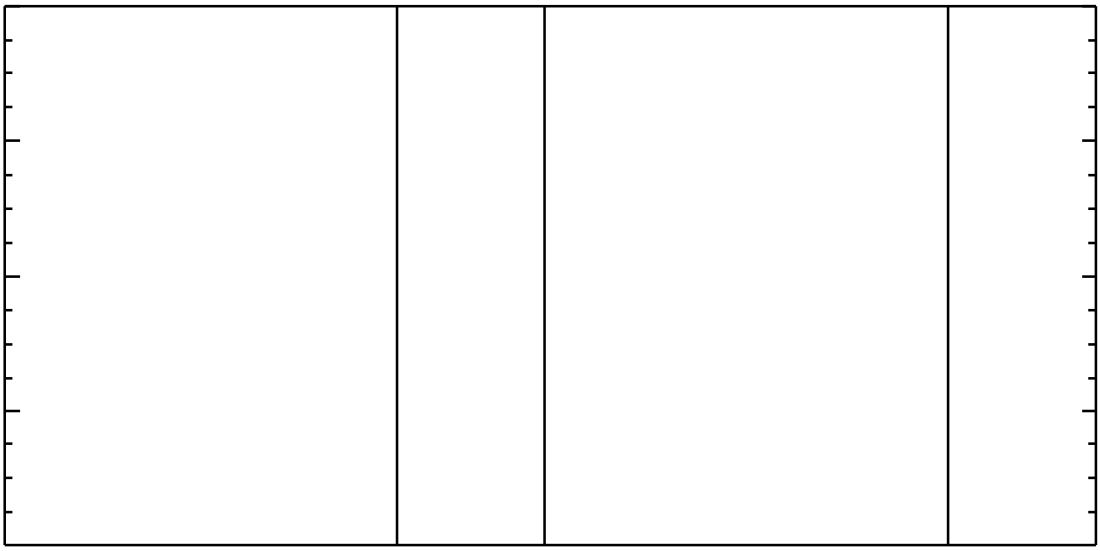
Remarks

spectrum geo services

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP05 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

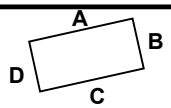


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.30 | ES | | GL - 0.40 | 1 | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| 0.90 | ES | | | | |
| | | | 0.45 - 1.20 | 2 | Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |

Groundwater Observations

None

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 1.3 | m |
| Width of Face B | 0.45 | m |




Remarks

| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

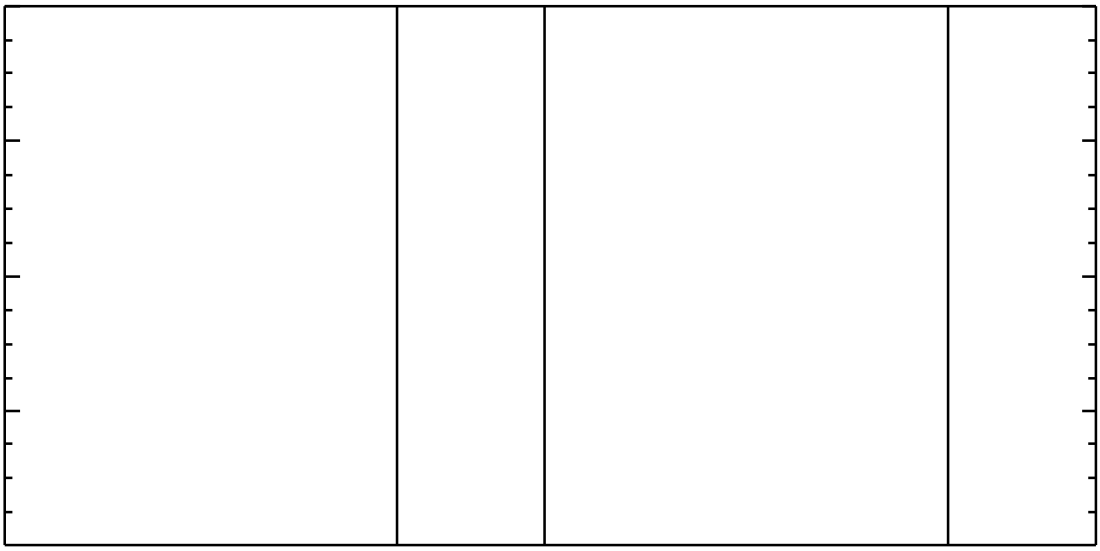
Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

Logger's Signature
PL

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP06 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

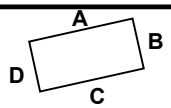


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.30 | ES | | GL - 0.40 | 1 | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with low cobble content of angular brick and sandstone. Fill. |
| 0.90 | ES | | | | |
| | | | 0.40 - 1.00 | 2 | Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | |

Groundwater Observations

None

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 1.7 | m |
| Width of Face B | 0.4 | m |




| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

Remarks

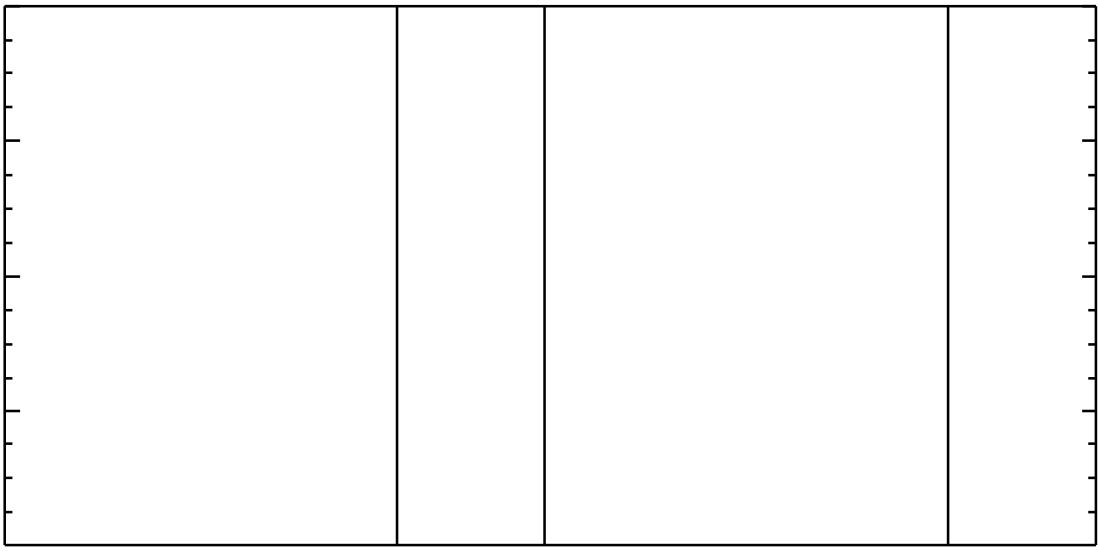
Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

Logger's Signature
PL

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP07 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

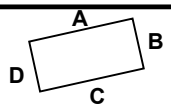


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.50 | ES | | GL - 0.50 | 1 | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | | 0.50 | 2 | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |

Groundwater Observations

None

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 3.5 | m |
| Width of Face B | 0.45 | m |




| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

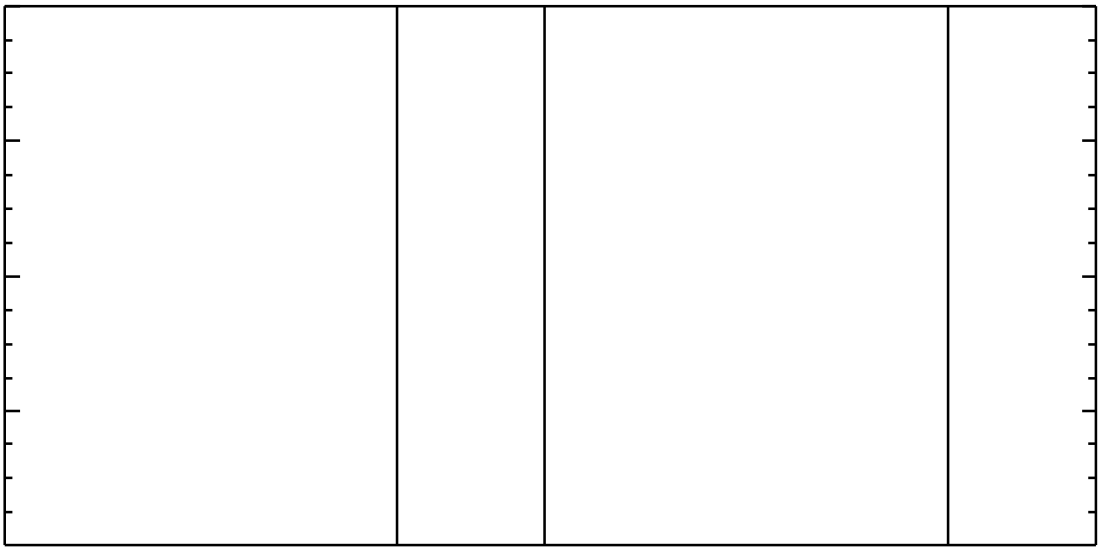
Remarks

Logger's Signature
PL

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP08 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

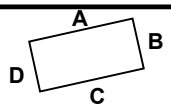


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.50 | ES | | GL - 0.70 | 1 | MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | | 0.70 | 2 | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |

Groundwater Observations

None

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 2.5 | m |
| Width of Face B | 0.45 | m |




| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

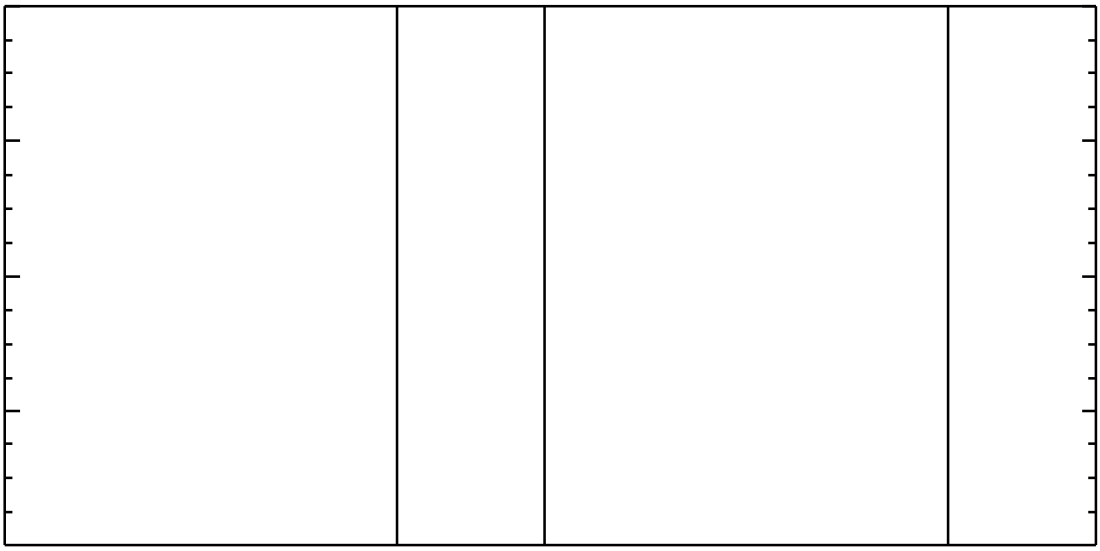
Remarks

Logger's Signature
PL

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP09 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

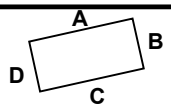


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.50 | ES | | GL - 0.80 | 1 | MADE GROUND: Multicoloured slightly silty sandy angular to subangular fine to coarse GRAVEL of sandstone and brick with medium to high cobble content of angular brick and sandstone. Fill. |
| | | | 0.80 | 2 | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |

Groundwater Observations

None

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 2 | m |
| Width of Face B | 0.45 | m |




| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

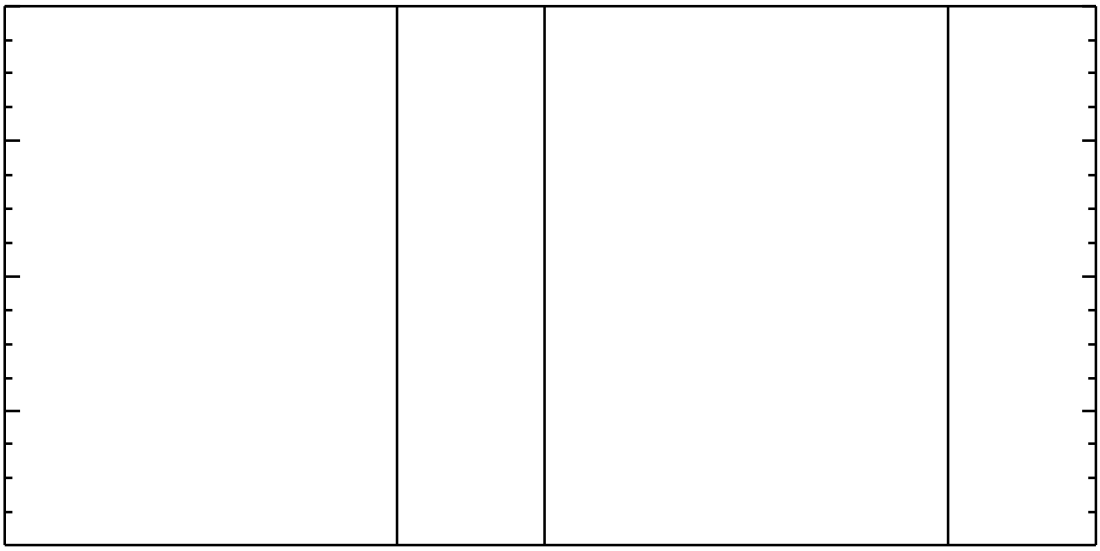
Remarks

Logger's Signature
PL

# Trial Pit/Trench Description

| | | | |
|---|---|---|---|
| Project | Blaendulais Add | Project No | 22181 |
| Described by | PL | Trial Pit No | TP10 |
| Date | 19.02.2025 | Sheet No | 1 of 1 |

Face Sketch (Indicate stratum boundaries, codes and Face(s) sketched, use additional sheets as required)

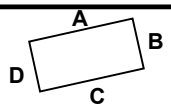


| Samples and Tests | | | Strata | | |
|---|---|---|---|---|---|
| Depth, m | Type & No | Results | Depth, m | Code | Description |
| 0.40 | ES | | GL - 0.45 | 1 | MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill. |
| 1.00 | ES | | | | |
| | | | 0.45 - 1.10 | 2 | Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | |

Groundwater Observations

Seepage at interface of made ground and natural material

| | | |
|---|---|---|
| Strike of Face A | | deg |
| Length of Face A | 1.2 | m |
| Width of Face B | 0.4 | m |




| | |
|---|---|
| Method/plant | 1.5 ton tracked excavator |
| Stability | Stable |
| Shoring | None |
| Weather | Drizzle |

Sample Type:
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water
ES Environmental Soil Sample
EW Environmental Water Sample

Remarks

Logger's Signature
PL

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| SA01 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.30 - 0.50 | ES | | | | | MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill. |
| | | | | | 0.50 | | | Brown, orange and grey slightly sandy clayey subrounded fine to coarse GRAVEL of sandstone with low cobble content of subrounded sandstone. GLACIAL TILL. |
| | | | | | 1.20 | | | End of Borehole at 1.200m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| SA02 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | 0.10 | | | Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of brick and sandstone. TOPSOIL. |
| | | 0.50 - 1.00 | ES | | 0.50 | | | MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill. |
| | | | | | | | | Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | 1.00 | | | End of Borehole at 1.000m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Equipment: 2.5 ton excavator |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| SA03 | TP | | PL | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.30 - 0.50 | ES | | 0.10 | | | Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of brick and sandstone. TOPSOIL. |
| | | | | | 0.50 | | | MADE GROUND: Multicoloured clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with low cobble content of angular brick, sandstone and concrete. Fill. |
| | | | | | 0.90 | | | Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | | | | 0.91 | | | Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION |
| | | | | | | | | End of Borehole at 0.900m |

1
2
3
4
5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

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# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Drilling Equipment: DART |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS01 | WS | | PL | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | 0.50 | | | GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | 1.00 | SPT | N=18 (4,2/2,4,7,5) | 1.00 | | | 0.50 - 1.00: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | 1.50 | SPT | N=50 (3,4/50 for 20mm) | 1.50 | | | No Recovery |
| | | | | | 1.51 | | | Probable Bedrock |
| | | | | | | | | End of Borehole at 1.500m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

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# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Drilling Equipment: DART |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS02 | WS | | PL | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.30 - 0.50 | ES | | 0.50 | | | GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | 0.70 - 1.00 | ES | | | | | 0.50 - 1.30: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | 1.00 | SPT | N=50 (3,3/50 for 160mm) | 1.30 | | | Probable Bedrock |
| | | | | | 1.31 | | | End of Borehole at 1.300m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

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# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Drilling Equipment: DART |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS03 | WS | | PL | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.40 - 0.70 | ES | | | | | GL - 0.70: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | 0.70 - 1.00 | ES | | 0.70 | | | |
| | | 0.90 | SPT | N=30 (1,1/30 for 5mm) | 0.90<br>0.91 | | | 0.70 - 0.90: Stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL.<br>Probable Bedrock<br>End of Borehole at 0.900m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

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# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Drilling Equipment: DART |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS04 | WS | | PL | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 - 0.50 | ES | | | | | GL - 0.50: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill. |
| | | 0.50 - 1.00 | ES | | 0.50 | | | 0.50 - 1.00: Stiff to very stiff brown, orange and grey slightly sandy gravelly CLAY with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. GLACIAL TILL. |
| | | 1.00 | SPT | N=50 (3,5/50 for 10mm) | 1.00<br>1.10 | | | Probable Bedrock |
| | | | | | | | | End of Borehole at 1.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

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# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 10/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: LJ | Drilling Equipment: DART |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS05 | WS | | PL | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.45 | SPT | N=50 (25 for 15mm/50 for 10mm) | 0.45<br>0.46 | | | GL - 0.45: MADE GROUND: Black and grey slightly silty angular to subangular fine to coarse GRAVEL of sandstone and brick with medium cobble content of angular brick and sandstone. Fill.<br>0.45: Strong grey and dark grey SANDSTONE. Bedrock of the SOUTH WALES MIDDLE COAL MEASURES FORMATION<br>End of Borehole at 0.450m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH03 | RO | | PL | 1:50 | Sheet 1 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 0.40 | | | BACKFILL ** |
| | | | | | | | | 1.30 | | | CLAY ** |
| | | | | | | | | 2.90 | | | CLAY and BOULDERS ** |
| | | | | | | | | 4.30 | | | WEATHERED MUDSTONE ** |
| | | | | | | | | 5.30 | | | SANDSTONE ** |
| | | | | | | | | 5.90 | | | MUDSTONE ** |
| | | | | | | | | | | | SANDSTONE ** |

1 2 3 4 5 6 7 8 9 10

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH03 | RO | | PL | 1:50 | Sheet 2 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ▼ | | | | | | | 17.20 | | | SANDSTONE ** |
| | | | | | | | | | | | MUDSTONE ** |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH03 | RO | | PL | 1:50 | Sheet 3 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | MUDSTONE ** |
| | | | | | | | | 23.80 | | | SILTSTONE ** |
| | | | | | | | | 24.80 | | | COAL |
| | | | | | | | | 25.00 | | | MUDSTONE ** |
| | | | | | | | | 30.00 | | | End of Borehole at 30.000m |

21 22 23 24 25 26 27 28 29 30

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH04 | RO | | PL | 1:50 | Sheet 1 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 0.40 | | | BACKFILL ** |
| | | | | | | | | 1.10 | | | WEATHERED MUDSTONE ** |
| | | | | | | | | 8.70 | | | SANDSTONE ** |
| | | | | | | | | | | | SILTSTONE ** |

1 2 3 4 5 6 7 8 9 10

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH04 | RO | | PL | 1:50 | Sheet 2 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ▼ | | | | | | | 17.30 | | | SILTSTONE ** |
| | | | | | | | | | | | MUDSTONE ** |

11 12 13 14 15 16 17 18 19 20

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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# Rotary Core Log

| | | |
|---|---|---|
| Project Name: Blaendulais | Client: TRJ | Date: 09/10/2023 |
| Location: Blaendulais | Contractor: Apex Drilling Services | |
| Project No. : 22181 | Crew Name: TD/JB | Drilling Equipment: Fraste PLG |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH04 | RO | | PL | 1:50 | Sheet 3 of 3 |

| Well | Water | Depth (m) | Type /FI | Coring TCR | Coring SCR | Coring RQD | Diameter Recovery (SPT) | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | MUDSTONE ** |
| | | | | | | | | 22.20 | | | COAL ** |
| | | | | | | | | 22.50 | | | MUDSTONE ** |
| | | | | | | | | 25.10 | | | SILTSTONE ** |
| | | | | | | | | 30.00 | | | End of Borehole at 30.000m |

21 22 23 24 25 26 27 28 29 30

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | | Drilling Flush | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation | Depth Top | Depth Base | Type | Colour | Min (%) | Max (%) |
| | | | | | | | | | | | | | | | | | |

Remarks

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## Appendix C

## Laboratory Testing

Soil Testing Results

Groundwater Testing Results

WAC Analysis

# Results Summary

**Apex Testing Solutions Limited**
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Telephone: 01656 746762
E-mail: andrew.grogan@apex-drilling.com
laura.davis@apex-drilling.com

| **Reporting Details** | | **Key Information** | |
|---|---|---|---|
| **Company Name:** | Spectrum Geo | **Site Name:** | Blaendulais |
| **Address:** | Foxglove Cottage | | |
| | Cwm Risca Lane | **Job Number:** | D23449 |
| | Bridgend | **Date Received:** | 16/10/2023 |
| | CF32 0EH | **Job Coordinator:** | A. Grogan |
| **Contact Name:** | **Rob** | | |
| **Contact Number:** | | | |

| Item No. | Tests Undertaken | Number of Tests |
|---|---|---|
| 1 | Atterburg Limits (4 point) - BS1377-2: 1990 | 3 |
| 2 | # pH & sulphate (pH/SO4) | 3 |
| 3 | Courier Charge | 3 |

**Results Issued: 25/10/2023**

**Comments**

Results herein relate only to samples received in the laboratory and where not sampled by Apex Testing Solutions personnel relate to the samples as received.
Where tests are UKAS accredited any Opinion and/or Interpretation expressed herein are outside the scope of the UKAS Accreditation. The reports shall not be reproduced in full without the written approval of the laboratory.

Please contact the job coordinator should any further information be required.

# TEST REPORT

## Determination Of Water Content

## ISO 17892-1: 2014+A1:2022

| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend |
| **ATS Sample No:** | 34755 | | CF32 0EH |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS02 | **Depth (m):** | 0.70 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Brown sandy gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | ISO 17892-1 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 21 October 2023 |

**Test Results**

| | |
|---|---|
| Moisture Content (%) | 20.9 |

**Remarks:**

| | | | | | |
|---|---|---|---|---|---|
| **QA Ref.** | **Apex Testing Solutions** | | Approver | Date | Fig |
| EN ISO 17892-1:2014 A1:2022 | Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ<br>Tel: 01656 746762 Fax: 01656 749096 | 7771 | A Grogan | 21/10/2023 | **MC** |
| | | | A Grogan, Laboratory Manager | | |

# TEST REPORT

## LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

### BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

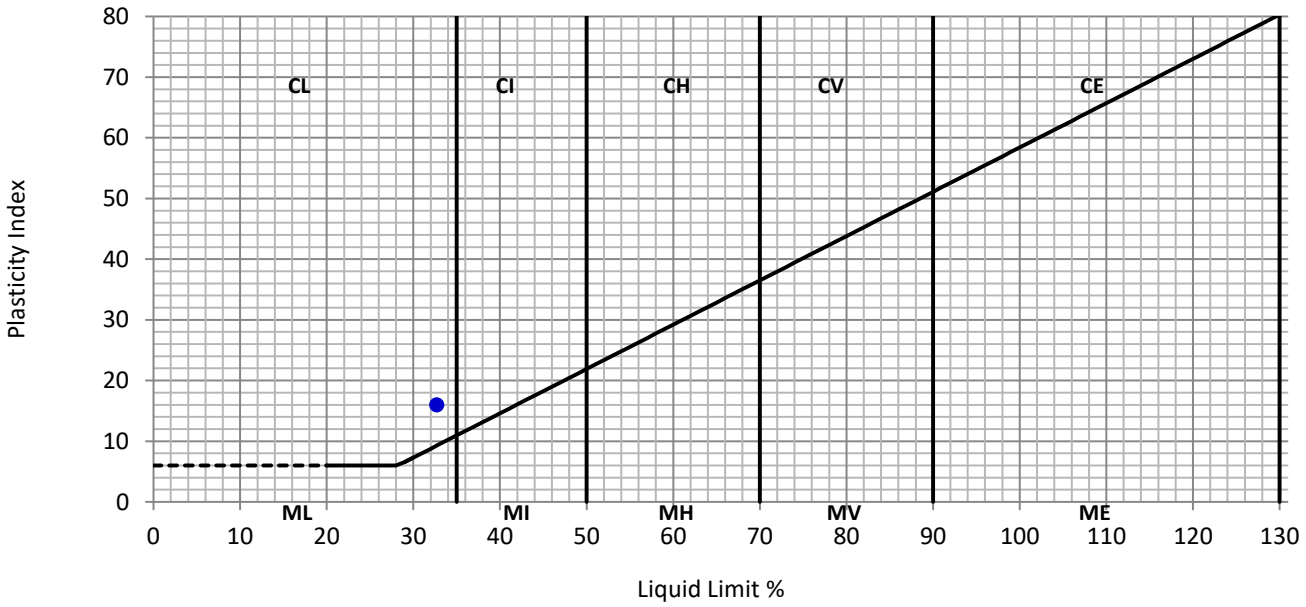
| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend<br>CF32 0EH |
| **ATS Sample No:** | 34755 | | |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS02 | **Depth (m):** | 0.70 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Brown sandy gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | BS1377 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 19 October 2023 |

**Test Results**

| | | |
|---|---|---|
| Liquid Limit | 33 | % |
| Plastic Limit | 17 | % |
| Plasticity Index | 16 | % |

| | | |
|---|---|---|
| Preparation: | 4.2.4 Sieved Specimen | |
| Proportion retained on 425µm sieve: | 35 | % |




**Remarks:**

# TEST REPORT

## Determination Of Water Content

## ISO 17892-1: 2014+A1:2022

| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend |
| **ATS Sample No:** | 34756 | | CF32 0EH |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS03 | **Depth (m):** | 0.70 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Dark grey very gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | ISO 17892-1 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 18 October 2023 |

**Test Results**

| | |
|---|---|
| Moisture Content (%) | 17.6 |

**Remarks:**

| | | | | | |
|---|---|---|---|---|---|
| **QA Ref.** | **Apex Testing Solutions** | | Approver | Date | Fig |
| EN ISO 17892-1:2014 A1:2022 | Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ<br>Tel: 01656 746762 Fax: 01656 749096 | 7771 | A Grogan | 21/10/2023 | **MC** |
| | | | A Grogan, Laboratory Manager | | |

# TEST REPORT

## LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

### BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

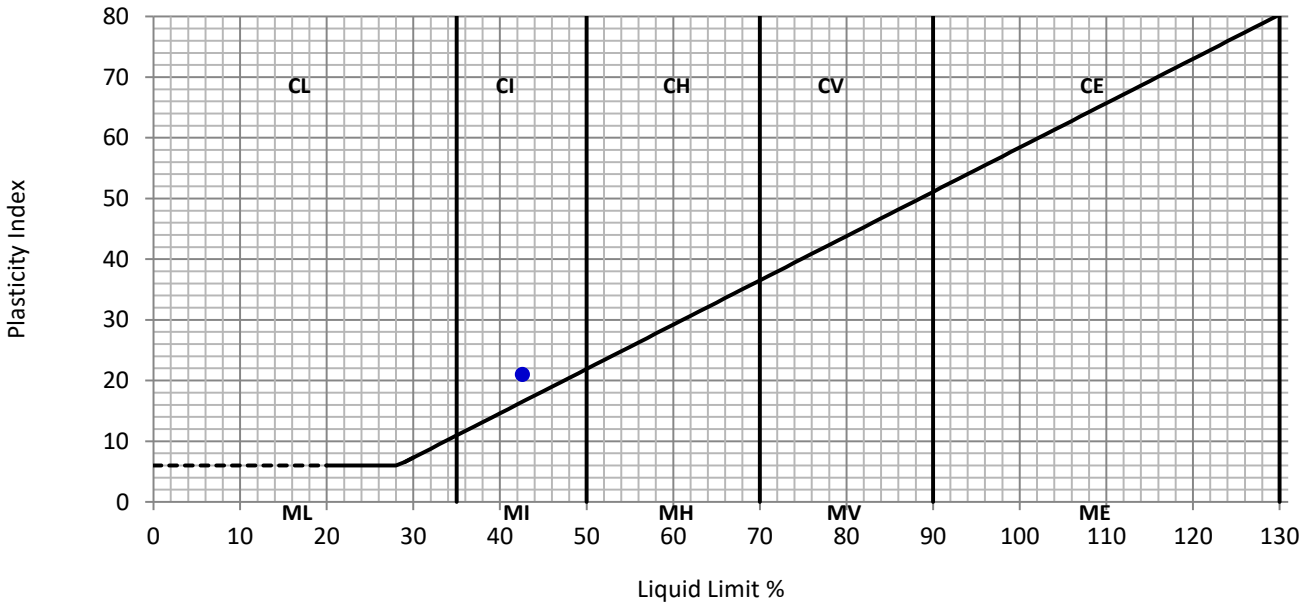
| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend<br>CF32 0EH |
| **ATS Sample No:** | 34756 | | |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS03 | **Depth (m):** | 0.70 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Dark grey very gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | BS1377 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 19 October 2023 |

**Test Results**

| | | |
|---|---|---|
| Liquid Limit | 43 | % |
| Plastic Limit | 22 | % |
| Plasticity Index | 21 | % |

| | | |
|---|---|---|
| Preparation: | 4.2.4 Sieved Specimen | |
| Proportion retained on 425µm sieve: | 76 | % |




**Remarks:**

| | | | | |
|---|---|---|---|---|
| QA Ref. BS1377 - 2 Rev. 3.0 | **Apex Testing Solutions**<br>Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ<br>Tel: 01656 746762 Fax: 01656 749096 | UKAS TESTING 7771 | Approver: *A Grogan*<br>A Grogan, Laboratory Manager | Date: 21/10/2023 | Fig. **ATT** |

# TEST REPORT

## Determination Of Water Content

## ISO 17892-1: 2014+A1:2022

| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend |
| **ATS Sample No:** | 34757 | | CF32 0EH |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS04 | **Depth (m):** | 0.50 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Brown sandy gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | ISO 17892-1 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 21 October 2023 |

**Test Results**

| | |
|---|---|
| Moisture Content (%) | 9.9 |

**Remarks:**

| | | | | | |
|---|---|---|---|---|---|
| **QA Ref.** | **Apex Testing Solutions** | | Approver | Date | Fig |
| EN ISO 17892-1:2014 A1:2022 | Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ<br>Tel: 01656 746762 Fax: 01656 749096 | 7771 | A Grogan | 21/10/2023 | **MC** |
| | | | A Grogan, Laboratory Manager | | |

# TEST REPORT

## LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

### BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

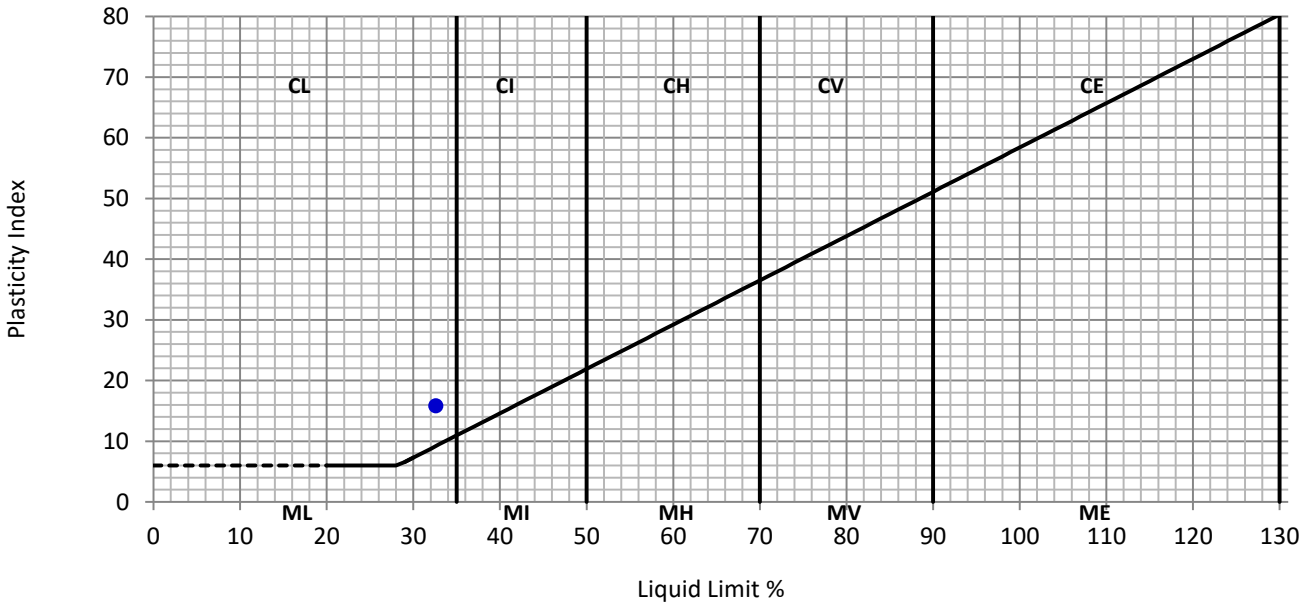
| | | | |
|---|---|---|---|
| **Project No:** | D23449 | **Client:** | Spectrum Geo |
| **Project Name:** | 22181 - Blaendulais | **Address:** | Foxglove Cottage<br>Cwm Risca Lane<br>Bridgend<br>CF32 0EH |
| **ATS Sample No:** | 34757 | | |

| | | | |
|---|---|---|---|
| **Site Ref / Hole ID:** | WS04 | **Depth (m):** | 0.50 - 1.00 |
| **Sample No:** | | **Sample Type:** | Disturbed |
| **Sampling Certificate Received:** | No | **Material Description:** | Brown sandy gravelly CLAY |
| **Location in Works:** | N/a | **Material Source:** | Ex-Site |
| **Date Sampled:** | Unknown | **Material Supplier:** | Ex-Site |
| **Sampled By:** | Client | **Specification:** | BS1377 |
| **Date Received:** | 16 October 2023 | **Date Tested:** | 19 October 2023 |

**Test Results**

| | | |
|---|---|---|
| Liquid Limit | 33 | % |
| Plastic Limit | 17 | % |
| Plasticity Index | 16 | % |

| | | |
|---|---|---|
| Preparation: | 4.2.4 Sieved Specimen | |
| Proportion retained on 425µm sieve: | 32 | % |




**Remarks:**

| | | | | |
|---|---|---|---|---|
| QA Ref. BS1377 - 2 Rev. 3.0 | **Apex Testing Solutions**<br>Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ<br>Tel: 01656 746762 Fax: 01656 749096 | UKAS TESTING 7771 | Approver: A Grogan<br>A Grogan, Laboratory Manager | Date: 21/10/2023 | Fig. ATT |

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Apex Testing Solutions Limited
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

**Attention:** Laura Davies

# CERTIFICATE OF ANALYSIS

| | |
|---|---|
| **Date of report Generation:** | 25 October 2023 |
| **Customer:** | Apex Testing Solutions Limited |
| **Sample Delivery Group (SDG):** | 231019-54 |
| **Your Reference:** | D23449 |
| **Location:** | Blaendulais |
| **Report No:** | 708685 |
| **Order Number:** | ATS 1866 |

We received 3 samples on Thursday October 19, 2023 and 3 of these samples were scheduled for analysis which was completed on Wednesday October 25, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



**Sonia McWhan**
Operations Manager

1291

# CERTIFICATE OF ANALYSIS

**SDG:** 231019-54 **Report Number:** 708685 **Superseded Report:**
**Client Ref.:** D23449 **Location:** Blaendulais

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 28808066 | WS2 | | 0.70 - 1.00 | 17/10/2023 |
| 28808069 | WS3 | | 0.70 - 1.00 | 17/10/2023 |
| 28808072 | WS4 | | 0.50 - 1.00 | 17/10/2023 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

Validated

# CERTIFICATE OF ANALYSIS

**SDG:** 231019-54 **Report Number:** 708685 **Superseded Report:**
**Client Ref.:** D23449 **Location:** Blaendulais

**Results Legend**

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

| | | | | | |
|---|---|---|---|---|---|
| **Lab Sample No(s)** | | | 28808066 | 28808069 | 28808072 |
| **Customer Sample Reference** | | | WS2 | WS3 | WS4 |
| **AGS Reference** | | | | | |
| **Depth (m)** | | | 0.70 - 1.00 | 0.70 - 1.00 | 0.50 - 1.00 |
| **Container** | | | 250g Amber Jar (ALE210) | 250g Amber Jar (ALE210) | 250g Amber Jar (ALE210) |
| **Sample Type** | | | S | S | S |
| Anions by Kone (soil) | All | NDPs: 0 Tests: 3 | X | X | X |
| Sample description | All | NDPs: 0 Tests: 3 | X | X | X |

# CERTIFICATE OF ANALYSIS

**SDG:** 231019-54 **Report Number:** 708685 **Superseded Report:**
**Client Ref.:** D23449 **Location:** Blaendulais

# Sample Descriptions

## Grain Sizes

| very fine | <0.063mm | fine | 0.063mm - 0.1mm | medium | 0.1mm - 2mm | coarse | 2mm - 10mm | very coarse | >10mm |
|---|---|---|---|---|---|---|---|---|---|

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|
| 28808066 | WS2 | 0.70 - 1.00 | Dark Brown | Sandy Clay Loam | Stones | Vegetation |
| 28808069 | WS3 | 0.70 - 1.00 | Dark Brown | Silt Loam | None | Stones |
| 28808072 | WS4 | 0.50 - 1.00 | Dark Brown | Sandy Clay Loam | Stones | None |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

# CERTIFICATE OF ANALYSIS

**SDG:** 231019-54 **Report Number:** 708685 **Superseded Report:**
**Client Ref.:** D23449 **Location:** Blaendulais

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-4+§@ | Sample deviation (see appendix) |

| Customer Sample Ref. | WS2 | WS3 | WS4 | | | |
|---|---|---|---|---|---|---|
| Depth (m) | 0.70 - 1.00 | 0.70 - 1.00 | 0.50 - 1.00 | | | |
| Sample Type | Soil/Solid (S) | Soil/Solid (S) | Soil/Solid (S) | | | |
| Date Sampled | 17/10/2023 | 17/10/2023 | 17/10/2023 | | | |
| Sample Time | . | . | . | | | |
| Date Received | 19/10/2023 | 19/10/2023 | 19/10/2023 | | | |
| SDG Ref | 231019-54 | 231019-54 | 231019-54 | | | |
| Lab Sample No.(s) | 28808066 | 28808069 | 28808072 | | | |
| AGS Reference | | | | | | |
| **Component** | **LOD/Units** | **Method** | | | | |
| Moisture Content Ratio (% of as received sample) | % | PM024 | 17 | 10 | 13 | |
| Water Soluble Sulphate as SO4 2:1 Extract | <0.004 g/l | TM243 | 0.0727 M | 0.005 M | 0.0635 M | |

# Table of Results - Appendix

| Method No | Description |
|---|---|
| PM024 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material |
| TM243 | Mixed Anions In Soils By Kone |

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

# CERTIFICATE OF ANALYSIS

**SDG:** 231019-54 **Report Number:** 708685 **Superseded Report:**
**Client Ref.:** D23449 **Location:** Blaendulais

## Test Completion Dates

| Lab Sample No(s) | 28808066 | 28808069 | 28808072 |
|---|---|---|---|
| Customer Sample Ref. | WS2 | WS3 | WS4 |
| AGS Ref. | | | |
| Depth | 0.70 - 1.00 | 0.70 - 1.00 | 0.50 - 1.00 |
| Type | Soil/Solid (S) | Soil/Solid (S) | Soil/Solid (S) |
| Anions by Kone (soil) | 25-Oct-2023 | 25-Oct-2023 | 25-Oct-2023 |
| Sample description | 19-Oct-2023 | 19-Oct-2023 | 19-Oct-2023 |

# Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

| | |
|---|---|
| 1 | **Container with Headspace provided for volatiles analysis** |
| 2 | **Incorrect container received** |
| 3 | **Deviation from method** |
| 4 | **Matrix interference** |
| ♦ | **Sample holding time exceeded in laboratory** |
| @ | **Sample holding time exceeded due to late arrival of instructions or samples** |
| § | **Sampled on date not provided** |

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

**Identification of Asbestos in Bulk Materials & Soils**

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

**Respirable Fibres**

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

**Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.**

**The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 23/10186
**Issue Number:** 1 **Date:** 07 November, 2023

**Client:**
Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

**Project Manager:** Rob Griffiths
**Project Name:** Blaendulais
**Project Ref:** 22181
**Order No:** 22181/01
**Date Samples Received:** 16/10/23
**Date Instructions Received:** 16/10/23
**Date Analysis Completed:** 07/11/23

**Approved by:**



Richard Wong
Client Manager

**Envirolab Job Number: 23/10186**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 23/10186/1 | 23/10186/2 | 23/10186/3 | 23/10186/4 | 23/10186/5 | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01 | TP03 | WS02 | WS03 | WS04 | | | | | |
| Depth to Top | 0.60 | 0.30 | 0.30 | 0.40 | 0.20 | | | | | |
| Depth To Bottom | 0.90 | 0.60 | 1.00 | 0.70 | 0.50 | | | | | |
| Date Sampled | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | | | |
| Sample Matrix Code | 3A | 4AE | 4AE | 4AE | 4AB | | | | | |
| % Stones >10mm$_A$ | 13.1 | 12.7 | 13.9 | 3.6 | 35.3 | | | % w/w | 0.1 | A-T-044 |
| pH$_D$$^{M\#}$ | 6.24 | 9.63 | 9.02 | 8.26 | 9.01 | | | pH | 0.01 | A-T-031s |
| Sulphate (water sol 2:1)$_D$$^{M\#}$ | 0.04 | 0.19 | 0.07 | <0.01 | - | | | g/l | 0.01 | A-T-026s |
| Organic Matter$_D$$^{M\#}$ | 2.1 | 0.4 | 6.2 | 96.4 | - | | | % w/w | 0.1 | A-T-032s |
| Arsenic$_D$$^{M\#}$ | 3 | 26 | 15 | 5 | - | | | mg/kg | 1 | A-T-024s |
| Boron (water soluble)$_D$$^{M\#}$ | <1.0 | <1.0 | <1.0 | <1.0 | - | | | mg/kg | 1 | A-T-027s |
| Cadmium$_D$$^{M\#}$ | <0.5 | <0.5 | 1.3 | <0.5 | - | | | mg/kg | 0.5 | A-T-024s |
| Copper$_D$$^{M\#}$ | 16 | 49 | 65 | 53 | - | | | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 12 | 14 | 13 | 6 | - | | | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | <1 | <1 | <1 | - | | | mg/kg | 1 | A-T-040s |
| Lead$_D$$^{M\#}$ | 11 | 33 | 38 | 32 | - | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | <0.17 | <0.17 | - | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 14 | 23 | 26 | 9 | - | | | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | <1 | <1 | <1 | - | | | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 31 | 126 | 2990 | 75 | - | | | mg/kg | 5 | A-T-024s |
| TPH total (>C6-C40)$_A$$^{M\#}$ | 528 | 87 | 99 | 60 | - | | | mg/kg | 10 | A-T-007s |

**Envirolab Job Number: 23/10186**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 23/10186/1 | 23/10186/2 | 23/10186/3 | 23/10186/4 | 23/10186/5 | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01 | TP03 | WS02 | WS03 | WS04 | | | | | |
| Depth to Top | 0.60 | 0.30 | 0.30 | 0.40 | 0.20 | | | | | |
| Depth To Bottom | 0.90 | 0.60 | 1.00 | 0.70 | 0.50 | | | | | |
| Date Sampled | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | | | |
| Sample Matrix Code | 3A | 4AE | 4AE | 4AE | 4AB | | | | | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | NAD | NAD | - | | | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | - | - | - | | | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | - | - | - | | | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | N/A | N/A | - | | | | | A-T-045 |

**Envirolab Job Number: 23/10186**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 23/10186/1 | 23/10186/2 | 23/10186/3 | 23/10186/4 | 23/10186/5 | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01 | TP03 | WS02 | WS03 | WS04 | | | | | |
| Depth to Top | 0.60 | 0.30 | 0.30 | 0.40 | 0.20 | | | | | |
| Depth To Bottom | 0.90 | 0.60 | 1.00 | 0.70 | 0.50 | | | | | |
| Date Sampled | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | 11-Oct-23 | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | | | |
| Sample Matrix Code | 3A | 4AE | 4AE | 4AE | 4AB | | | | | |
| PAH-16MS | | | | | | | | | | |
| Acenaphthene$_{A}^{M\#}$ | 0.01 | <0.01 | 0.01 | 0.06 | - | | | mg/kg | 0.01 | A-T-019s |
| Acenaphthylene$_{A}^{M\#}$ | 0.01 | <0.01 | <0.01 | 0.01 | - | | | mg/kg | 0.01 | A-T-019s |
| Anthracene$_{A}^{M\#}$ | 0.02 | <0.02 | <0.02 | 0.07 | - | | | mg/kg | 0.02 | A-T-019s |
| Benzo(a)anthracene$_{A}^{M\#}$ | <0.04 | 0.09 | 0.11 | 0.14 | - | | | mg/kg | 0.04 | A-T-019s |
| Benzo(a)pyrene$_{A}^{M\#}$ | <0.04 | 0.08 | 0.09 | 0.07 | - | | | mg/kg | 0.04 | A-T-019s |
| Benzo(b)fluoranthene$_{A}^{M\#}$ | <0.05 | 0.16 | 0.18 | 0.29 | - | | | mg/kg | 0.05 | A-T-019s |
| Benzo(ghi)perylene$_{A}^{M\#}$ | <0.05 | 0.07 | 0.08 | <0.05 | - | | | mg/kg | 0.05 | A-T-019s |
| Benzo(k)fluoranthene$_{A}^{M\#}$ | <0.07 | <0.07 | <0.07 | 0.09 | - | | | mg/kg | 0.07 | A-T-019s |
| Chrysene$_{A}^{M\#}$ | <0.06 | 0.14 | 0.16 | 0.29 | - | | | mg/kg | 0.06 | A-T-019s |
| Dibenzo(ah)anthracene$_{A}$ | <0.04 | <0.04 | <0.04 | <0.04 | - | | | mg/kg | 0.04 | A-T-019s |
| Fluoranthene$_{A}^{M\#}$ | <0.08 | 0.19 | 0.20 | 0.57 | - | | | mg/kg | 0.08 | A-T-019s |
| Fluorene$_{A}^{M\#}$ | 0.04 | <0.01 | <0.01 | 0.02 | - | | | mg/kg | 0.01 | A-T-019s |
| Indeno(123-cd)pyrene$_{A}^{M\#}$ | <0.03 | 0.08 | 0.09 | 0.06 | - | | | mg/kg | 0.03 | A-T-019s |
| Naphthalene $_{A}^{M\#}$ | <0.03 | <0.03 | 0.03 | 0.12 | - | | | mg/kg | 0.03 | A-T-019s |
| Phenanthrene$_{A}^{M\#}$ | <0.03 | 0.15 | 0.15 | 0.71 | - | | | mg/kg | 0.03 | A-T-019s |
| Pyrene$_{A}^{M\#}$ | <0.07 | 0.13 | 0.16 | 0.27 | - | | | mg/kg | 0.07 | A-T-019s |
| Total PAH-16MS$_{A}$ | 0.08 | 1.09 | 1.26 | 2.77 | - | | | mg/kg | 0.01 | A-T-019s |

## Report Notes

**General**
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **six weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| N/A | Not applicable |

**Asbestos**
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ 25$^{o}$C / 11550µS/cm @ 20$^{o}$C fall outside the accreditation range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondu, Wales, CF32 0EH

**Project:** Blaendulais

**Clients Project No:** 22181

**Project No:** 23/10186

**Date Received:** 16/10/2023 (am)

**Cool Box Temperatures (°C):** 12.1

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 23/10186/1 | 23/10186/2 | 23/10186/3 | 23/10186/4 | 23/10186/5 |
|---|---|---|---|---|---|
| Client Sample No | | | | | |
| Client Sample ID/Depth | TP01 0.60-0.90m | TP03 0.30-0.60m | WS02 0.30-1.00m | WS03 0.40-0.70m | WS04 0.20-0.50m |
| Date Sampled | 11/10/23 | 11/10/23 | 11/10/23 | 11/10/23 | 11/10/23 |
| A-T-004s | | | | | 23/10/2023 |
| A-T-007s | 23/10/2023 | 23/10/2023 | 23/10/2023 | 23/10/2023 | 23/10/2023 |
| A-T-019s | 25/10/2023 | 25/10/2023 | 25/10/2023 | 25/10/2023 | 25/10/2023 |
| A-T-022s | | | | | 23/10/2023 |
| A-T-024s | 26/10/2023 | 26/10/2023 | 28/10/2023 | 26/10/2023 | |
| A-T-025w | | | | | 30/10/2023 |
| A-T-026s | 26/10/2023 | 26/10/2023 | 26/10/2023 | 26/10/2023 | |
| A-T-026w | | | | | 30/10/2023 |
| A-T-026w (F) | | | | | 30/10/2023 |
| A-T-027s | 27/10/2023 | 27/10/2023 | 27/10/2023 | 27/10/2023 | |
| A-T-030s | | | | | 26/10/2023 |
| A-T-031s | 26/10/2023 | 26/10/2023 | 26/10/2023 | 26/10/2023 | 26/10/2023 |
| A-T-031w | | | | | 30/10/2023 |
| A-T-032s | 02/11/2023 | 01/11/2023 | 01/11/2023 | 07/11/2023 | 02/11/2023 |
| A-T-032w | | | | | 30/10/2023 |
| A-T-037w | | | | | 30/10/2023 |
| A-T-040s | 02/11/2023 | 26/10/2023 | 26/10/2023 | 26/10/2023 | |
| A-T-044 | 27/10/2023 | 27/10/2023 | 27/10/2023 | 27/10/2023 | 27/10/2023 |
| A-T-045 | 20/10/2023 | 20/10/2023 | 20/10/2023 | 20/10/2023 | |
| A-T-050w | | | | | 30/10/2023 |
| A-T-ANCs | | | | | 26/10/2023 |
| Calc-no stones | | | | | 30/10/2023 |
| Probe (w) | | | | | 30/10/2023 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

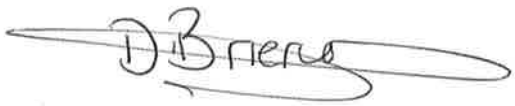
# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 25/01885
**Issue Number:** 1 **Date:** 11 March, 2025

**Client:**
Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

**Project Manager:** Rob Griffiths
**Project Name:** Blaendulais
**Project Ref:** 22181
**Order No:** 22181/02
**Date Samples Received:** 26/02/25
**Date Instructions Received:** 26/02/25
**Date Analysis Completed:** 07/03/25

**Approved by:**



Danielle Brierley
Client Services Supervisor

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/1 | 25/01885/2 | 25/01885/3 | 25/01885/4 | 25/01885/5 | 25/01885/6 | 25/01885/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP05 | TP05 | TP06 | TP06 | TP07 | TP08 | TP09 | | | |
| Depth to Top | 0.30 | 0.90 | 0.30 | 0.90 | 0.50 | 0.50 | 0.50 | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOLID | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6ABE | 4AE | 6A | 7 | 6AE | 4A | | | |
| % Stones >10mm$_A$ | <0.1 | 33.6 | 11.0 | 22.4 | <0.1 | 39.7 | 26.4 | % w/w | 0.1 | A-T-044 |
| pH$_D$$^{M\#}$ | 7.68 | 8.27 | 9.50 | 6.26 | 10.51$^U$ | 7.99 | 8.86 | pH | 0.01 | A-T-031s |
| Sulphate (water sol 2:1)$_D$$^{M\#}$ | <0.01 | 0.03 | 0.33 | 0.21 | 0.01$^U$ | <0.01 | 0.04 | g/l | 0.01 | A-T-026s |
| Organic Matter$_D$$^{M\#}$ | 1.96 | 8.92 | 10.6 | 2.07 | 16.8$^U$ | 45.7 | 6.06 | % w/w | 0.14 | A-T-032s |
| Arsenic$_D$$^{M\#}$ | 10 | 124 | 23 | 2 | 27$^U$ | 12 | 37 | mg/kg | 1 | A-T-024s |
| Boron (water soluble)$_D$$^{M\#}$ | <1.0 | <1.0 | 3.2 | <1.0 | <1.0$^U$ | <1.0 | <1.0 | mg/kg | 1 | A-T-027s |
| Cadmium$_D$$^{M\#}$ | <0.5 | <0.5 | <0.5 | <0.5 | <0.5$^U$ | <0.5 | <0.5 | mg/kg | 0.5 | A-T-024s |
| Copper$_D$$^{M\#}$ | 14 | 119 | 53 | 16 | 73$^U$ | 45 | 68 | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 16 | 8 | 16 | 9 | 225$^U$ | 7 | 10 | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-040s |
| Lead$_D$$^{M\#}$ | 20 | 61 | 45 | 14 | 41$^U$ | 36 | 32 | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 12 | 12 | 18 | 12 | 26$^U$ | 17 | 14 | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | 1 | <1 | <1 | 3$^U$ | <1 | <1 | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 45 | 181 | 165 | 32 | 129$^U$ | 69 | 106 | mg/kg | 1 | A-T-024s |
| TPH total (>C6-C40)$_A$$^{M\#}$ | <10 | 20 | 284 | <10 | 84$^U$ | 26 | 78 | mg/kg | 10 | A-T-007s |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/1 | 25/01885/2 | 25/01885/3 | 25/01885/4 | 25/01885/5 | 25/01885/6 | 25/01885/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP05 | TP05 | TP06 | TP06 | TP07 | TP08 | TP09 | | | |
| Depth to Top | 0.30 | 0.90 | 0.30 | 0.90 | 0.50 | 0.50 | 0.50 | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOLID | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6ABE | 4AE | 6A | 7 | 6AE | 4A | | | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | NAD | NAD | NAD$^{U}$ | NAD | NAD | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | A-T-045 |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/1 | 25/01885/2 | 25/01885/3 | 25/01885/4 | 25/01885/5 | 25/01885/6 | 25/01885/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP05 | TP05 | TP06 | TP06 | TP07 | TP08 | TP09 | | | |
| Depth to Top | 0.30 | 0.90 | 0.30 | 0.90 | 0.50 | 0.50 | 0.50 | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOLID | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6ABE | 4AE | 6A | 7 | 6AE | 4A | | | |
| **PAH-16MS** | | | | | | | | | | |
| Acenaphthene$_A^{M\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | 0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-019s |
| Acenaphthylene$_A^{M\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | 0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-019s |
| Anthracene$_A^{M\#}$ | <0.02 | 0.02 | <0.02 | <0.02 | 0.03$^U$ | <0.02 | <0.02 | mg/kg | 0.02 | A-T-019s |
| Benzo(a)anthracene$_A^{M\#}$ | <0.04 | 0.23 | <0.04 | <0.04 | 0.09$^U$ | 0.04 | <0.04 | mg/kg | 0.04 | A-T-019s |
| Benzo(a)pyrene$_A^{M\#}$ | <0.04 | 0.17 | <0.04 | <0.04 | 0.06$^U$ | <0.04 | <0.04 | mg/kg | 0.04 | A-T-019s |
| Benzo(b)fluoranthene$_A^{M\#}$ | <0.05 | 0.26 | <0.05 | <0.05 | 0.14$^U$ | 0.07 | <0.05 | mg/kg | 0.05 | A-T-019s |
| Benzo(ghi)perylene$_A^{M\#}$ | <0.05 | 0.10 | <0.05 | <0.05 | <0.05$^U$ | <0.05 | <0.05 | mg/kg | 0.05 | A-T-019s |
| Benzo(k)fluoranthene$_A^{M\#}$ | <0.07 | 0.09 | <0.07 | <0.07 | <0.07$^U$ | <0.07 | <0.07 | mg/kg | 0.07 | A-T-019s |
| Chrysene$_A^{M\#}$ | <0.06 | 0.26 | <0.06 | <0.06 | 0.14$^U$ | 0.06 | <0.06 | mg/kg | 0.06 | A-T-019s |
| Dibenzo(ah)anthracene$_A^{M\#}$ | <0.04 | <0.04 | <0.04 | <0.04 | <0.04$^U$ | <0.04 | <0.04 | mg/kg | 0.04 | A-T-019s |
| Fluoranthene$_A^{M\#}$ | <0.08 | 0.38 | <0.08 | <0.08 | 0.19$^U$ | 0.08 | <0.08 | mg/kg | 0.08 | A-T-019s |
| Fluorene$_A^{M\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | 0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-019s |
| Indeno(123-cd)pyrene$_A^{M\#}$ | <0.03 | 0.11 | <0.03 | <0.03 | 0.04$^U$ | 0.03 | <0.03 | mg/kg | 0.03 | A-T-019s |
| Naphthalene $_A^{M\#}$ | <0.03 | <0.03 | <0.03 | <0.03 | 0.04$^U$ | <0.03 | <0.03 | mg/kg | 0.03 | A-T-019s |
| Phenanthrene$_A^{M\#}$ | <0.03 | 0.11 | 0.04 | <0.03 | 0.16$^U$ | 0.07 | <0.03 | mg/kg | 0.03 | A-T-019s |
| Pyrene$_A^{M\#}$ | <0.07 | 0.29 | <0.07 | <0.07 | 0.14$^U$ | <0.07 | <0.07 | mg/kg | 0.07 | A-T-019s |
| Total PAH-16MS$_A^{M\#}$ | <0.08 | 2.02 | <0.08 | <0.08 | 1.06$^U$ | 0.35 | <0.08 | mg/kg | 0.01 | A-T-019s |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/1 | 25/01885/2 | 25/01885/3 | 25/01885/4 | 25/01885/5 | 25/01885/6 | 25/01885/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP05 | TP05 | TP06 | TP06 | TP07 | TP08 | TP09 | | | |
| Depth to Top | 0.30 | 0.90 | 0.30 | 0.90 | 0.50 | 0.50 | 0.50 | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | 24-Feb-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOLID | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6ABE | 4AE | 6A | 7 | 6AE | 4A | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1 | <1 | <1 | <1 | 1$^U$ | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | <1 | <1 | 1 | <1 | 6$^U$ | 1 | 3 | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | <1 | <1 | 3 | <1 | 8$^U$ | 4 | 5 | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | <1 | 7 | 48 | <1 | 23$^U$ | 67 | 114 | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | <1 | 8 | 53 | <1 | 38 | 73 | 122 | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | <1 | 1 | <1 | 1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | <1 | <1 | 2 | <1 | 6 | 2 | 3 | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | <1 | 2 | 5 | <1 | 10$^U$ | 7 | 7 | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | <1 | 8 | 16 | <1 | 9$^U$ | 7 | 22 | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | <1 | 11 | 24 | <1 | 26 | 15 | 33 | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | <1 | 19 | 77 | <1 | 64 | 88 | 154 | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01$^U$ | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/8 | 25/01885/9 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP10 | TP10 | | | | | | | | |
| Depth to Top | 0.40 | 1.00 | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6AE | 6A | | | | | | | | |
| % Stones >10mm$_A$ | <0.1 | <0.1 | | | | | | % w/w | 0.1 | A-T-044 |
| pH$_D$$^{M\#}$ | 7.68 | 7.28 | | | | | | pH | 0.01 | A-T-031s |
| Sulphate (water sol 2:1)$_D$$^{M\#}$ | 0.02 | <0.01 | | | | | | g/l | 0.01 | A-T-026s |
| Organic Matter$_D$$^{M\#}$ | 57.2 | 3.60 | | | | | | % w/w | 0.14 | A-T-032s |
| Arsenic$_D$$^{M\#}$ | 33 | 6 | | | | | | mg/kg | 1 | A-T-024s |
| Boron (water soluble)$_D$$^{M\#}$ | <1.0 | <1.0 | | | | | | mg/kg | 1 | A-T-027s |
| Cadmium$_D$$^{M\#}$ | 1.1 | <0.5 | | | | | | mg/kg | 0.5 | A-T-024s |
| Copper$_D$$^{M\#}$ | 211 | 30 | | | | | | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 13 | 12 | | | | | | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-040s |
| Lead$_D$$^{M\#}$ | 422 | 28 | | | | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | 0.50 | <0.17 | | | | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 31 | 26 | | | | | | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 389 | 67 | | | | | | mg/kg | 1 | A-T-024s |
| TPH total (>C6-C40)$_A$$^{M\#}$ | 158 | <10 | | | | | | mg/kg | 10 | A-T-007s |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/8 | 25/01885/9 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP10 | TP10 | | | | | | | | |
| Depth to Top | 0.40 | 1.00 | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6AE | 6A | | | | | | | | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | | | | | | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | | | | | | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | | | | | | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | | | | | | | | A-T-045 |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/8 | 25/01885/9 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP10 | TP10 | | | | | | | | |
| Depth to Top | 0.40 | 1.00 | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6AE | 6A | | | | | | | | |
| **PAH-16MS** | | | | | | | | | | |
| Acenaphthene$_A^{M\#}$ | 0.05 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Acenaphthylene$_A^{M\#}$ | 0.03 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Anthracene$_A^{M\#}$ | 0.11 | <0.02 | | | | | | mg/kg | 0.02 | A-T-019s |
| Benzo(a)anthracene$_A^{M\#}$ | 0.48 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(a)pyrene$_A^{M\#}$ | 0.37 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(b)fluoranthene$_A^{M\#}$ | 0.68 | <0.05 | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(ghi)perylene$_A^{M\#}$ | 0.22 | <0.05 | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(k)fluoranthene$_A^{M\#}$ | 0.23 | <0.07 | | | | | | mg/kg | 0.07 | A-T-019s |
| Chrysene$_A^{M\#}$ | 0.78 | <0.06 | | | | | | mg/kg | 0.06 | A-T-019s |
| Dibenzo(ah)anthracene$_A^{M\#}$ | 0.08 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Fluoranthene$_A^{M\#}$ | 1.27 | <0.08 | | | | | | mg/kg | 0.08 | A-T-019s |
| Fluorene$_A^{M\#}$ | 0.04 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Indeno(123-cd)pyrene$_A^{M\#}$ | 0.25 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Naphthalene $_A^{M\#}$ | 0.16 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Phenanthrene$_A^{M\#}$ | 0.74 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Pyrene$_A^{M\#}$ | 0.90 | <0.07 | | | | | | mg/kg | 0.07 | A-T-019s |
| Total PAH-16MS$_A^{M\#}$ | 6.39 | <0.08 | | | | | | mg/kg | 0.01 | A-T-019s |

**Envirolab Job Number: 25/01885**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/01885/8 | 25/01885/9 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP10 | TP10 | | | | | | | | |
| Depth to Top | 0.40 | 1.00 | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 24-Feb-25 | 24-Feb-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6AE | 6A | | | | | | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | 3 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | 8 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | 61 | 1 | | | | | | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 72 | 1 | | | | | | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | 1 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | 7 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | 33 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | 113 | <1 | | | | | | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 154 | <1 | | | | | | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 227 | 1 | | | | | | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.10 | <0.01 | | | | | | mg/kg | 0.01 | A-T-022s |

## Report Notes

**General**

•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "D" on Asbestos | Analysis performed on a dried aliquot of sample provided. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| Trace | Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh. |
| N/A | Not applicable |

**Asbestos**

**Identification:** Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.
**Quantification:** Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.
**PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.**

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ $25^0$C / 11550µS/cm @ $20^0$C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondu, Wales, CF32 0EH

**Project:** Blaendulais

**Clients Project No:** 22181

**Project No:** 25/01885

**Date Received:** 26/02/2025 (am)

**Cool Box Temperatures (°C):** 7.2

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 25/01885/1 | 25/01885/2 | 25/01885/3 | 25/01885/4 | 25/01885/5 | 25/01885/6 | 25/01885/7 | 25/01885/8 | 25/01885/9 |
|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | |
| Client Sample ID/Depth | TP05 0.30m | TP05 0.90m | TP06 0.30m | TP06 0.90m | TP07 0.50m | TP08 0.50m | TP09 0.50m | TP10 0.40m | TP10 1.00m |
| Date Sampled | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 | 24/02/25 |
| A-T-007s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 07/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-019s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-022s | 28/02/2025 | 28/02/2025 | 28/02/2025 | 28/02/2025 | 28/02/2025 | 28/02/2025 | 28/02/2025 | 03/03/2025 | 28/02/2025 |
| A-T-024s | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 |
| A-T-026s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-027s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-031s | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 | 04/03/2025 |
| A-T-032s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-040s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-044 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 05/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| A-T-045 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 | 27/02/2025 |
| A-T-055s | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |
| Calc-As Recd | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 | 03/03/2025 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

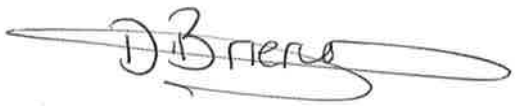
# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 25/05508
**Issue Number:** 1 **Date:** 04 June, 2025

**Client:**
Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

**Project Manager:** Rob Griffiths
**Project Name:** Blaendulais
**Project Ref:** 22181
**Order No:** 22181/03
**Date Samples Received:** 27/05/25
**Date Instructions Received:** 27/05/25
**Date Analysis Completed:** 04/06/25

**Approved by:**



Danielle Brierley
Client Services Supervisor

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

**Envirolab Job Number: 25/05508**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/05508/1 | 25/05508/2 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01a | TP07a | | | | | | | | |
| Depth to Top | 0.00 | 0.00 | | | | | | | | |
| Depth To Bottom | 0.50 | 0.50 | | | | | | | | |
| Date Sampled | 22-May-25 | 22-May-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6A | 6AB | | | | | | | | |
| % Stones >10mm$_A$ | <0.1 | <0.1 | | | | | | % w/w | 0.1 | A-T-044 |
| pH$_D$$^{M\#}$ | 8.31 | 8.22 | | | | | | pH | 0.01 | A-T-031s |
| Sulphate (water sol 2:1)$_D$$^{M\#}$ | 0.01 | <0.01 | | | | | | g/l | 0.01 | A-T-026s |
| Organic Matter$_D$$^{M\#}$ | 2.22 | 1.11 | | | | | | % w/w | 0.14 | A-T-032s |
| Arsenic$_D$$^{M\#}$ | 5 | 5 | | | | | | mg/kg | 1 | A-T-024s |
| Boron (water soluble)$_D$$^{M\#}$ | <1.0 | <1.0 | | | | | | mg/kg | 1 | A-T-027s |
| Cadmium$_D$$^{M\#}$ | <0.5 | <0.5 | | | | | | mg/kg | 0.5 | A-T-024s |
| Copper$_D$$^{M\#}$ | 24 | 23 | | | | | | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 13 | 15 | | | | | | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-040s |
| Lead$_D$$^{M\#}$ | 14 | 15 | | | | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | | | | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 25 | 26 | | | | | | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | <1 | | | | | | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 59 | 58 | | | | | | mg/kg | 1 | A-T-024s |
| TPH total (>C6-C40)$_A$$^{M\#}$ | <10 | <10 | | | | | | mg/kg | 10 | A-T-007s |

Envirolab Job Number: 25/05508

Client Project Name: Blaendulais

Client Project Ref: 22181

| Lab Sample ID | 25/05508/1 | 25/05508/2 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01a | TP07a | | | | | | | | |
| Depth to Top | 0.00 | 0.00 | | | | | | | | |
| Depth To Bottom | 0.50 | 0.50 | | | | | | | | |
| Date Sampled | 22-May-25 | 22-May-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6A | 6AB | | | | | | | | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | | | | | | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | | | | | | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | | | | | | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | | | | | | | | A-T-045 |

Envirolab Job Number: 25/05508

Client Project Name: Blaendulais

Client Project Ref: 22181

| Lab Sample ID | 25/05508/1 | 25/05508/2 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01a | TP07a | | | | | | | | |
| Depth to Top | 0.00 | 0.00 | | | | | | | | |
| Depth To Bottom | 0.50 | 0.50 | | | | | | | | |
| Date Sampled | 22-May-25 | 22-May-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6A | 6AB | | | | | | | | |
| PAH-16MS | | | | | | | | | | |
| Acenaphthene$_A^{M\#}$ | <0.01 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Acenaphthylene$_A^{M\#}$ | <0.01 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Anthracene$_A^{M\#}$ | <0.02 | <0.02 | | | | | | mg/kg | 0.02 | A-T-019s |
| Benzo(a)anthracene$_A^{M\#}$ | <0.04 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(a)pyrene$_A^{M\#}$ | <0.04 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(b)fluoranthene$_A^{M\#}$ | <0.05 | <0.05 | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(ghi)perylene$_A^{M\#}$ | <0.05 | <0.05 | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(k)fluoranthene$_A^{M\#}$ | <0.07 | <0.07 | | | | | | mg/kg | 0.07 | A-T-019s |
| Chrysene$_A^{M\#}$ | <0.06 | <0.06 | | | | | | mg/kg | 0.06 | A-T-019s |
| Dibenzo(ah)anthracene$_A^{M\#}$ | <0.04 | <0.04 | | | | | | mg/kg | 0.04 | A-T-019s |
| Fluoranthene$_A^{M\#}$ | <0.08 | <0.08 | | | | | | mg/kg | 0.08 | A-T-019s |
| Fluorene$_A^{M\#}$ | <0.01 | <0.01 | | | | | | mg/kg | 0.01 | A-T-019s |
| Indeno(123-cd)pyrene$_A^{M\#}$ | <0.03 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Naphthalene $_A^{M\#}$ | <0.03 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Phenanthrene$_A^{M\#}$ | <0.03 | <0.03 | | | | | | mg/kg | 0.03 | A-T-019s |
| Pyrene$_A^{M\#}$ | <0.07 | <0.07 | | | | | | mg/kg | 0.07 | A-T-019s |

Envirolab Job Number: 25/05508

Client Project Name: Blaendulais

Client Project Ref: 22181

| Lab Sample ID | 25/05508/1 | 25/05508/2 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01a | TP07a | | | | | | | | |
| Depth to Top | 0.00 | 0.00 | | | | | | | | |
| Depth To Bottom | 0.50 | 0.50 | | | | | | | | |
| Date Sampled | 22-May-25 | 22-May-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6A | 6AB | | | | | | | | |
| Leachate Prep BS EN 12457-2 (10:1) A | * | * | | | | | | | | A-T-001 |
| Total PAH-16MS$_A^{M\#}$ | <0.08 | <0.08 | | | | | | mg/kg | 0.01 | A-T-019s |

**Envirolab Job Number: 25/05508**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/05508/1 | 25/05508/2 | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | TP01a | TP07a | | | | | | | | |
| Depth to Top | 0.00 | 0.00 | | | | | | | | |
| Depth To Bottom | 0.50 | 0.50 | | | | | | | | |
| Date Sampled | 22-May-25 | 22-May-25 | | | | | | | | |
| Sample Type | SOIL - ES | SOIL - ES | | | | | | | | |
| Sample Matrix Code | 6A | 6AB | | | | | | | | |
| **TPH CWG (leachable) with Clean Up** | | | | | | | | | | |
| Ali >C5-C6 (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| Ali >C6-C8 (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| Ali >C8-C10 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Ali >C10-C12 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Ali >C12-C16 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Ali >C16-C21 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Ali >C21-C35 (leachable)$_A$ | <20 | <20 | | | | | | µg/l | 20 | A-T-055w |
| Total Aliphatics (leachable)$_A$ | <20 | <20 | | | | | | µg/l | 10 | Calc-As Recd |
| Aro >C5-C7 (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| Aro >C7-C8 (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| Aro >C8-C10 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Aro >C10-C12 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Aro >C12-C16 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Aro >C16-C21 (leachable)$_A$ | <10 | <10 | | | | | | µg/l | 10 | A-T-055w |
| Aro >C21-C35 (leachable)$_A$ | <20 | <20 | | | | | | µg/l | 20 | A-T-055w |
| Total Aromatics (leachable)$_A$ | <20 | <20 | | | | | | µg/l | 20 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35) (leachable)$_A$ | <20 | <20 | | | | | | µg/l | 20 | Calc-As Recd |
| BTEX - Benzene (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| BTEX - Toluene (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| BTEX - Ethyl Benzene (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| BTEX - o Xylene (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| BTEX - m & p Xylene (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |
| MTBE (leachable)$_A$ | <1 | <1 | | | | | | µg/l | 1 | A-T-022w |

## Report Notes

**General**
•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "D" on Asbestos | Analysis performed on a dried aliquot of sample provided. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| Trace | Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh. |
| N/A | Not applicable |

**Asbestos**
**Identification:** Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ $25^0$C / 11550µS/cm @ $20^0$C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondu, Wales, CF32 0EH

**Project:** Blaendulais

**Clients Project No:** 22181

**Project No:** 25/05508

**Date Received:** 27/05/2025 (am)

**Cool Box Temperatures (°C):** 15.6

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 25/05508/1 | 25/05508/2 |
|---|---|---|
| Client Sample No | | |
| Client Sample ID/Depth | TP01a 0.00-0.50m | TP07a 0.00-0.50m |
| Date Sampled | 22/05/25 | 22/05/25 |
| A-T-007s | 02/06/2025 | 02/06/2025 |
| A-T-019s | 04/06/2025 | 04/06/2025 |
| A-T-022w | 03/06/2025 | 03/06/2025 |
| A-T-024s | 04/06/2025 | 04/06/2025 |
| A-T-026s | 04/06/2025 | 04/06/2025 |
| A-T-027s | 03/06/2025 | 03/06/2025 |
| A-T-031s | 03/06/2025 | 03/06/2025 |
| A-T-032s | 03/06/2025 | 03/06/2025 |
| A-T-040s | 04/06/2025 | 04/06/2025 |
| A-T-044 | 30/05/2025 | 30/05/2025 |
| A-T-045 | 29/05/2025 | 29/05/2025 |
| A-T-055w | 03/06/2025 | 03/06/2025 |
| Calc-As Recd | 03/06/2025 | 03/06/2025 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

Units 7 & 8, Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

# Final Test Report

| | |
|---|---|
| Envirolab Job Number: | 23/10186 |
| Issue Number: | 1 |
| Date: | 7-Nov-23 |

Client: Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

| | |
|---|---|
| Project Manager: | Rob Griffiths |
| Project Name: | Blaendulais |
| Project Ref: | 22181 |
| Order No: | 22181/01 |
| Date Samples Received: | 16-Oct-23 |
| Date Instructions Received: | 16-Oct-23 |
| Date Analysis Completed: | 7-Nov-23 |

**Notes - Soil analysis**

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

**Notes - General**

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

**Predominant Matrix Codes:** 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

**Secondary Matrix Codes**: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

**HWOL TPH Code:** EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Richard Wong
Client Manager

***Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.***

| Sample Details | | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|---|
| Lab Sample ID | Method | ISO17025 | MCERTS | 23/10186/5 | | | | |
| Client Sample Number | | | | | | Inert Waste Landfill | Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill | Hazardous Waste Landfill |
| Client Sample ID | | | | WS04 | | | | |
| Depth to Top | | | | 0.2 | | | | |
| Depth to Bottom | | | | 0.50 | | | | |
| Date Sampled | | | | 11/10/2023 | | | | |
| Sample Type | | | | Soil - ES | | | | |
| Sample Matrix Code | | | | 4AB | | | | |
| **Solid Waste Analysis** | | | | | | | | |
| pH (pH Units)$_D$ | A-T-031 | N | N | **9.01** | | - | >6 | - |
| ANC to pH 4 (mol/kg)$_D$ | A-T-ANC | N | N | **0.46** | | - | to be evaluated | to be evaluated |
| ANC to pH 6 (mol/kg)$_D$ | A-T-ANC | N | N | **0.1** | | - | to be evaluated | to be evaluated |
| Loss on Ignition (%)$_D$ | A-T-030 | N | N | **2.7** | | - | - | 10 |
| Total Organic Carbon (%)$_D$ | A-T-032 | N | N | **0.89** | | 3 | 5 | 6 |
| PAH Sum of 17 (mg/kg)$_A$ | A-T-019 | N | N | **0.52** | | 100 | - | - |
| Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$ | A-T-007 | N | N | **64** | | 500 | - | - |
| Sum of 7 PCBs (mg/kg)$_A$ | A-T-004 | N | N | **<0.007** | | 1 | - | - |
| Sum of BTEX (mg/kg)$_A$ | A-T-022 | N | N | **<0.01** | | 6 | - | - |
| **Eluate Analysis** | | | | **10:1 mg/l** | **10:1 mg/kg** | **Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)** | | |
| Arsenic | A-T-025 | N | N | 0.007 | **0.070** | 0.5 | 2 | 25 |
| Barium | A-T-025 | N | N | 0.015 | **0.150** | 20 | 100 | 300 |
| Cadmium | A-T-025 | N | N | <0.001 | **<0.01** | 0.04 | 1 | 5 |
| Chromium | A-T-025 | N | N | 0.003 | **0.030** | 0.5 | 10 | 70 |
| Copper | A-T-025 | N | N | 0.006 | **0.060** | 2 | 50 | 100 |
| Mercury | A-T-025 | N | N | <0.0005 | **<0.005** | 0.01 | 0.2 | 2 |
| Molybdenum | A-T-025 | N | N | 0.001 | **0.010** | 0.5 | 10 | 30 |
| Nickel | A-T-025 | N | N | <0.002 | **<0.02** | 0.4 | 10 | 40 |
| Lead | A-T-025 | N | N | <0.001 | **<0.01** | 0.5 | 10 | 50 |
| Antimony | A-T-025 | N | N | 0.012 | **0.120** | 0.06 | 0.7 | 5 |
| Selenium | A-T-025 | N | N | 0.001 | **0.010** | 0.1 | 0.5 | 7 |
| Zinc | A-T-025 | N | N | 0.012 | **0.120** | 4 | 50 | 200 |
| Chloride | A-T-026 | N | N | 1 | **11** | 800 | 15000 | 25000 |
| Fluoride | A-T-026 | N | N | 0.2 | **2.0** | 10 | 150 | 500 |
| Sulphate as $SO_4$ | A-T-026 | N | N | 51 | **512** | 1000 | 20000 | 50000 |
| Total Dissolved Solids | A-T-035 | N | N | 96 | **960** | 4000 | 60000 | 100000 |
| Phenol Index | A-T-050 | N | N | <0.01 | **<0.1** | 1 | - | - |
| Dissolved Organic Carbon | A-T-032 | N | N | <2.0 | **<200** | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | | |
| pH (pH Units) | A-T-031 | N | N | 9.4 | | | | |
| Conductivity (µS/cm) | A-T-037 | N | N | 192 | | | | |
| Mass Sample (kg) | | | | 0.205 | | | | |
| Dry Matter (%) | A-T-044 | N | N | 85.2 | | | | |

Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 25/05485
**Issue Number:** 1 **Date:** 05 June, 2025

**Client:**
Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

**Project Manager:** Rob Griffiths
**Project Name:** Blaendulais
**Project Ref:** 22181
**Order No:** 22181/03
**Date Samples Received:** 27/05/25
**Date Instructions Received:** 27/05/25
**Date Analysis Completed:** 05/06/25

**Approved by:**



Richard Wong
Client Manager

UKAS TESTING
1247

**Envirolab Job Number: 25/05485**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/05485/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | BH03 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 22-May-25 | | | | | | | | | |
| Sample Type | WATER - GW | | | | | | | | | |
| Sample Matrix Code | N/A | | | | | | | | | |
| pH (w)$_A^\#$ | 7.71 | | | | | | | pH | 0.01 | A-T-031w |
| Sulphate (w)$_A^\#$ | 11 | | | | | | | mg/l | 1 | A-T-026w |
| Cyanide (total) (w)$_A^\#$ | <0.005 | | | | | | | mg/l | 0.005 | A-T-042wTCN |
| Phenols - Total by HPLC (w)$_A$ | <0.01 | | | | | | | mg/l | 0.01 | A-T-050w |
| DOC - Dissolved Organic Carbon (w)$_A^\#$ | <2.0 | | | | | | | mg/l | 2 | A-T-032w |
| Arsenic (dissolved)$_A^\#$ | <1 | | | | | | | µg/l | 1 | A-T-025w |
| Copper (dissolved)$_A^\#$ | <4 | | | | | | | µg/l | 4 | A-T-025w |
| Chromium (dissolved)$_A^\#$ | <1 | | | | | | | µg/l | 1 | A-T-025w |
| Lead (dissolved)$_A^\#$ | <1 | | | | | | | µg/l | 1 | A-T-025w |
| Mercury (dissolved)$_A^\#$ | <0.1 | | | | | | | µg/l | 0.1 | A-T-025w |
| Nickel (dissolved)$_A^\#$ | <2 | | | | | | | µg/l | 2 | A-T-025w |

**Envirolab Job Number: 25/05485**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/05485/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | BH03 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 22-May-25 | | | | | | | | | |
| Sample Type | WATER - GW | | | | | | | | | |
| Sample Matrix Code | N/A | | | | | | | | | |
| **PAH 16MS (w)** | | | | | | | | | | |
| Acenaphthene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Acenaphthylene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Anthracene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Benzo(a)anthracene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Benzo(a)pyrene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Benzo(b)fluoranthene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Benzo(ghi)perylene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Benzo(k)fluoranthene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Chrysene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Dibenzo(ah)anthracene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Fluoranthene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Fluorene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Indeno(123-cd)pyrene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Naphthalene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Phenanthrene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Pyrene (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |
| Total PAH 16MS (w)$_A^\#$ | <0.01 | | | | | | | µg/l | 0.01 | A-T-019w |

**Envirolab Job Number: 25/05485**

**Client Project Name: Blaendulais**

**Client Project Ref: 22181**

| Lab Sample ID | 25/05485/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | BH03 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 22-May-25 | | | | | | | | | |
| Sample Type | WATER - GW | | | | | | | | | |
| Sample Matrix Code | N/A | | | | | | | | | |
| **TPH CWG (w) with Clean Up** | | | | | | | | | | |
| Ali >C5-C6 $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| Ali >C6-C8 $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| Ali >C8-C10 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Ali >C10-C12 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Ali >C12-C16 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Ali >C16-C21 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Ali >C21-C35 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Total Aliphatics $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | Calc-As Recd |
| Aro >C5-C7 $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| Aro >C7-C8 $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| Aro >C8-C10 $(w)_A$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Aro >C10-C12 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Aro >C12-C16 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Aro >C16-C21 $(w)_A^{\#}$ | <5 | | | | | | | µg/l | 5 | A-T-055w |
| Aro >C21-C35 $(w)_A^{\#}$ | <10 | | | | | | | µg/l | 10 | A-T-055w |
| Total Aromatics $(w)_A^{\#}$ | <10 | | | | | | | µg/l | 10 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35) $(w)_A$ | <10 | | | | | | | µg/l | 10 | Calc-As Recd |
| BTEX - Benzene $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| BTEX - Toluene $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| BTEX - Ethyl Benzene $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| BTEX - m & p Xylene $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| BTEX - o Xylene $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |
| MTBE $(w)_A^{\#}$ | <1 | | | | | | | µg/l | 1 | A-T-022w |

## Report Notes

**General**
•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "D" on Asbestos | Analysis performed on a dried aliquot of sample provided. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| Trace | Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh. |
| N/A | Not applicable |

**Asbestos**
**Identification:** Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ $25^0$C / 11550µS/cm @ $20^0$C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondu, Wales, CF32 0EH

**Project:** Blaendulais

**Clients Project No:** 22181

**Project No:** 25/05485

**Date Received:** 27/05/2025 (am)

**Cool Box Temperatures (°C):** 15.6

| Lab Sample ID | 25/05485/1 |
|---|---|
| Client Sample No | |
| Client Sample ID/Depth | BH03 |
| Date Sampled | 22/05/25 |
| Deviation Code | |
| F | ✓ |

*Key*
*F* *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

## HOLDING TIME EXCEEDANCES

| Lab Sample ID | 25/05485/1 |
|---|---|
| Client Sample No | |
| Client Sample ID/Depth | BH03 |
| Date Sampled | 22/05/25 |
| pH (w) | ✓ |

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 25/05485/1 |
|---|---|
| Client Sample No | |
| Client Sample ID/Depth | BH03 |
| Date Sampled | 22/05/25 |
| A-T-019w | 29/05/2025 |
| A-T-022w | 02/06/2025 |
| A-T-025w | 05/06/2025 |
| A-T-026w | 28/05/2025 |
| A-T-031w | 28/05/2025 |
| A-T-032w | 29/05/2025 |
| A-T-042wTCN | 29/05/2025 |
| A-T-050w | 29/05/2025 |
| A-T-055w | 29/05/2025 |
| Calc-As Recd | 02/06/2025 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

# Appendix D

## Gas and Groundwater Monitoring

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 02/06/2022 | State of ground | |
| **Operator:** | Wind | Dty, warm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 14 |
| | Barometric Presure (mb) | 995 |

| | | |
|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 14.30 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 | 995 | 0.10 | | 3.30 |
| BH02 | 8.20 | 14.10 | 0.00 | 0.00 | 0.00 | 0.80 | 0.00 | 995 | 0.10 | | 3.40 |
| WS08 | 2.50 | 14.30 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 995 | 0.10 | | DRY |
| | | | | | | | | | | | |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| | | |
|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 09/06/2022 | State of ground | |
| **Operator:** | Wind | Overcast Warm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 16 |
| | Barometric Presure (mb) | 1017 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 1017 | 0.10 | | 3.30 |
| BH02 | 8.20 | 20.60 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 1017 | 0.10 | | 3.40 |
| WS08 | 2.50 | 20.40 | | | 0.10 | 0.50 | 0.00 | 1017 | 0.10 | | DRY |
| | | | | | | | | | | | |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| | | |
|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 15/06/2022 | State of ground | |
| **Operator:** | Wind | Clear wearm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 16 |
| | Barometric Presure (mb) | 998 |

| | | |
|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 998 | 0.10 | | 4.12 |
| BH02 | 8.20 | 16.90 | 0.00 | 0.00 | 0.10 | 0.40 | 0.00 | 998 | 0.20 | | DRY |
| WS08 | 2.50 | 20.40 | 0.00 | 0.00 | 0.10 | 0.50 | 0.00 | 998 | 0.20 | | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| | | |
|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 24/06/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 18 |
| | Barometric Presure (mb) | 1019 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 21.00 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 1.36 |
| BH03 | 1.30 | 20.90 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 1.19 |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 2.61 |
| WS08 | 2.50 | 20.90 | | | 0.00 | 0.20 | 0.00 | 1019 | 0.00 | 0.00 | DRY |
| | | | | | | | | | | | |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 01/07/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 21 |
| | Barometric Presure (mb) | 999 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | | | 0.00 | 0.00 | 0.00 | 999 | 0.00 | 0.00 | 1.35 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 999 | 0.00 | 0.00 | 1.20 |
| BH02 | 8.20 | 20.60 | | | 0.00 | 0.20 | 0.00 | 999 | 0.00 | 0.00 | 2.60 |
| WS08 | 2.50 | 20.70 | | | 0.00 | 0.30 | 0.00 | 999 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 05/07/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 14 |
| | Barometric Presure (mb) | 1011 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.90 | | | 0.00 | 0.00 | 0.00 | 1011 | 0.00 | 0.00 | 1.32 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 1011 | 0.00 | 0.00 | 1.10 |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.10 | 0.00 | 1011 | 0.00 | 0.00 | 2.51 |
| WS08 | 2.50 | 20.80 | | | 0.00 | 0.30 | 0.00 | 1011 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 19/02/2025 | State of ground | Wet |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 100% |
| | Precipitation | Light |
| | Temperature(deg.C) | 9 |
| | Barometric Presure (mb) | 988 |

| | | |
|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.90 | | | 0.00 | >>>> | 0.00 | 988 | 0.30 | 0.00 | 1.40 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 988 | 0.00 | 0.00 | Dry |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.10 | 0.00 | 988 | 0.00 | 0.00 | 2.60 |
| WS08 | 2.50 | 20.80 | | | 0.00 | 0.10 | 0.00 | 988 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Gas Monitoring | Blaendulias | Project No: 22181 |
|---|---|---|

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 02/06/2022 | State of ground | |
| **Operator:** | Wind | Dty, warm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 14 |
| | Barometric Presure (mb) | 995 |

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|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 14.30 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 | 995 | 0.10 | | 3.30 |
| BH02 | 8.20 | 14.10 | 0.00 | 0.00 | 0.00 | 0.80 | 0.00 | 995 | 0.10 | | 3.40 |
| WS08 | 2.50 | 14.30 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 995 | 0.10 | | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

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|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 09/06/2022 | State of ground | |
| **Operator:** | Wind | Overcast Warm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 16 |
| | Barometric Presure (mb) | 1017 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 1017 | 0.10 | | 3.30 |
| BH02 | 8.20 | 20.60 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 1017 | 0.10 | | 3.40 |
| WS08 | 2.50 | 20.40 | | | 0.10 | 0.50 | 0.00 | 1017 | 0.10 | | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

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|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| | | |
|---|---|---|
| **Date :** | **Meteorological and Site Conditions** | |
| 15/06/2022 | State of ground | |
| **Operator:** | Wind | Clear wearm |
| JTC | Wind Direction | |
| | Cloud Cover | |
| | Precipitation | None |
| | Temperature(deg.C) | 16 |
| | Barometric Presure (mb) | 998 |

| | | |
|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 998 | 0.10 | | 4.12 |
| BH02 | 8.20 | 16.90 | 0.00 | 0.00 | 0.10 | 0.40 | 0.00 | 998 | 0.20 | | DRY |
| WS08 | 2.50 | 20.40 | 0.00 | 0.00 | 0.10 | 0.50 | 0.00 | 998 | 0.20 | | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

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|---|---|---|
| **Gas Monitoring** | **Blaendulias** | **Project No:** 22181 |

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 24/06/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 18 |
| | Barometric Presure (mb) | 1019 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 21.00 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 1.36 |
| BH03 | 1.30 | 20.90 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 1.19 |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.00 | 0.00 | 1019 | 0.00 | 0.00 | 2.61 |
| WS08 | 2.50 | 20.90 | | | 0.00 | 0.20 | 0.00 | 1019 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 01/07/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 21 |
| | Barometric Presure (mb) | 999 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.80 | | | 0.00 | 0.00 | 0.00 | 999 | 0.00 | 0.00 | 1.35 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 999 | 0.00 | 0.00 | 1.20 |
| BH02 | 8.20 | 20.60 | | | 0.00 | 0.20 | 0.00 | 999 | 0.00 | 0.00 | 2.60 |
| WS08 | 2.50 | 20.70 | | | 0.00 | 0.30 | 0.00 | 999 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 05/07/2024 | State of ground | Dry |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 80% |
| | Precipitation | None |
| | Temperature(deg.C) | 14 |
| | Barometric Presure (mb) | 1011 |

| | |
|---|---|
| **Equipment Used:** | Dipmeter Multigas Analyser<br>30m |
| **Survey Information:** | BH01: Gas bung was on ground near to borehole. Repaced and sampled. |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.90 | | | 0.00 | 0.00 | 0.00 | 1011 | 0.00 | 0.00 | 1.32 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 1011 | 0.00 | 0.00 | 1.10 |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.10 | 0.00 | 1011 | 0.00 | 0.00 | 2.51 |
| WS08 | 2.50 | 20.80 | | | 0.00 | 0.30 | 0.00 | 1011 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Date : | Meteorological and Site Conditions | |
|---|---|---|
| 19/02/2025 | State of ground | Wet |
| **Operator:** | Wind | Light |
| PL | Wind Direction | SW |
| | Cloud Cover | 100% |
| | Precipitation | Light |
| | Temperature(deg.C) | 9 |
| | Barometric Presure (mb) | 988 |

| | | |
|---|---|---|
| **Equipment Used:** | Dipmeter<br>30m | Multigas Analyser |
| **Survey Information:** | | |

| BH | Depth (m) | $O_2$ (%v/v) | H2S ppm | CO ppm | $CH_4$ (%v/v) | $CO_2$ (%v/v) | LEL (%) | AP mb | Flow (l/h) | DP (Pa) | Dip (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.45 | 20.90 | | | 0.00 | >>>> | 0.00 | 988 | 0.30 | 0.00 | 1.40 |
| BH03 | 1.30 | 20.80 | | | 0.00 | >>>> | 0.00 | 988 | 0.00 | 0.00 | Dry |
| BH02 | 8.20 | 20.70 | | | 0.00 | 0.10 | 0.00 | 988 | 0.00 | 0.00 | 2.60 |
| WS08 | 2.50 | 20.80 | | | 0.00 | 0.10 | 0.00 | 988 | 0.00 | 0.00 | DRY |
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**Remarks:**

The concentrations of gases recorded above are subject to the accuracy, as specified by the manufacturer, of the instrument adopted. If concentration accuracies of less than +/- 2% are required, it is recommended that gas samples are recovered and laboratory analyses are undertaken.

| Gas Monitoring | Blaendulias | Project No: 22181 |
|---|---|---|

# Tetra Tech
## LANDGAS AND GROUNDWATER MONITORING RESULTS

TETRA TECH

**Site Name:** Blaendulais
**Job No.:** B035256
**Client:** Neath Port Talbot Council

**Date Monitored:** 02/06/22
**Monitoring Engineer:** JTC
**Weather:** dry, warm

**EQUIPMENT USED**

| Type | Make | Serial | Last Calibrated |
|---|---|---|---|
| **Gas Analyser** | **Landtec GA5000** | **G502044** | **Nov-21** |
| **Interface Meter** | **Solinst** | **122-004988-1** | **n/a** |
| | | | |

**LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS**

| Exploratory Hole No | Peak | | Steady | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CH_4$ (% vol) | $CO_2$ (% vol) | $CH_4$ (% vol) | $CO_2$ (% vol) | $O_2$ (% vol) | BAL (%) | PID (ppm) | $H_2S$ (ppm) | HCN (ppm) | CO (ppm) | Time | Remarks |
| BH02 | 0.0 | 0.9 | 0.0 | 0.9 | 14.1 | 84.9 | nt | 0 | nt | 0 | 10:00 | |
| BH01 | 0.0 | 0.8 | 0.0 | 0.9 | 14.3 | 84.8 | nt | 0 | nt | 0 | 10:30 | |
| WS08 | 0.0 | 0.6 | 0.0 | 0.6 | 14.3 | 85 | nt | 0 | nt | 0 | 10:45 | |
| | | | | | | | | | | | | |
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**LANDGAS - PHYSICAL PARAMETERS**

| Exploratory Hole No | Atmos Pressure (m bar) | Atmos Temp (°C) | BH Flow | | BH Pressure | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Peak (L/hr) | Steady (L/hr) | Peak (mbar) | Steady (mbar) | |
| BH02 | 995 | 14.0 | 0.1 | 0.1 | 0.14 | 0.14 | |
| BH01 | 995 | 14.0 | 0.1 | 0.1 | 0.13 | 0.13 | |
| WS08 | 995 | 14.0 | 0.1 | 0.1 | 0.10 | 0.10 | |
| | | | | | | | |
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**AMBIENT ATMOSPHERIC CONDITIONS**

| Parameter | Before Monitoring | After Monitoring |
|---|---|---|
| $CH_4$ (% vol) | 0.0 | 0.0 |
| $CO_2$ (% vol) | 0.2 | 0.0 |
| $O_2$ (% vol) | 21.1 | 21.1 |
| PID (ppm) | nt | nt |
| Atmos Press. (m bar) | 1018 | 1018 |

**ATMOSPHERIC PRESSURE CONDITIONS**

| | |
|---|---|
| 3 days prior (m bar) | 1019 |
| 2 days prior (m bar) | 1019 |
| 1 day prior (m bar) | 1018 |
| during (m bar) am,midday,pm | 1021, 1022, 1023 |
| 1 day post (m bar) | 1024 |

**GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS**

| Exploratory Hole No | Water Surface (mbgl) | Base Depth (mbgl) | LNAPL Surface (mbgl) | DNAPL Surface (mbgl) | Water Quality Indicators | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ORP (mV) | SPC (µs/cm) | C (µs/cm) | Ph (value) | DO (mg/L) | Dissolved Solids (ppt) | Resistivity (Ω·cm) | Temp (°C) | |
| BH02 | 3.30 | 3.40 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| BH01 | 3.40 | 6.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| WS08 | dry | 1.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Notes** nt = not tested
nd = not detected

Data Compiled by: JTC
Data Checked by: NEB

# Tetra Tech
## LANDGAS AND GROUNDWATER MONITORING RESULTS

TETRA TECH

**Site Name:** Blaendulais
**Job No.:** B035256
**Client:** Neath Port Talbot Council

**Date Monitored:** 09/06/22
**Monitoring Engineer:** JTC
**Weather:** overcast, warm

**EQUIPMENT USED**

| Type | Make | Serial | Last Calibrated |
|---|---|---|---|
| **Gas Analyser** | **Landtec GA5000** | **G502044** | **Nov-21** |
| **Interface Meter** | **Solinst** | **122-004988-1** | **n/a** |
| | | | |

**LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS**

| Exploratory Hole No | Peak | | Steady | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CH_4$ (% vol) | $CO_2$ (% vol) | $CH_4$ (% vol) | $CO_2$ (% vol) | $O_2$ (% vol) | BAL (%) | PID (ppm) | $H_2S$ (ppm) | HCN (ppm) | CO (ppm) | Time | Remarks |
| BH02 | 0.1 | 0.2 | 0.1 | 0.2 | 20.8 | 78.9 | nt | 0 | nt | 0 | 11:30 | |
| BH01 | 0.1 | 0.2 | 0.1 | 0.3 | 20.6 | 79.0 | nt | 0 | nt | 0 | 12:00 | |
| WS08 | 0.1 | 0.5 | 0.1 | 0.5 | 20.4 | 79 | nt | nt | nt | nt | 13:00 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**LANDGAS - PHYSICAL PARAMETERS**

| Exploratory Hole No | Atmos Pressure (m bar) | Atmos Temp (°C) | BH Flow | | BH Pressure | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Peak (L/hr) | Steady (L/hr) | Peak (mbar) | Steady (mbar) | |
| BH02 | 994 | 16.0 | 0.1 | 0.1 | 0.07 | 0.07 | |
| BH01 | 994 | 16.0 | 0.1 | 0.1 | 0.09 | 0.09 | |
| WS08 | 994 | 16.0 | 0.1 | 0.1 | 0.09 | 0.09 | |
| | | | | | | | |
| | | | | | | | |

**AMBIENT ATMOSPHERIC CONDITIONS**

| Parameter | Before Monitoring | After Monitoring |
|---|---|---|
| $CH_4$ (% vol) | 0.0 | 0.0 |
| $CO_2$ (% vol) | 0.0 | 0.0 |
| $O_2$ (% vol) | 21.4 | 21.5 |
| PID (ppm) | nt | nt |
| Atmos Press. (m bar) | 1017 | 1015 |

**ATMOSPHERIC PRESSURE CONDITIONS**

| | |
|---|---|
| 3 days prior (m bar) | 1019 |
| 2 days prior (m bar) | 1012 |
| 1 day prior (m bar) | 1008 |
| during (m bar) am,midday,pm | 1017, 1017, 1015 |
| 1 day post (m bar) | 1018 |

**GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS**

| Exploratory Hole No | Water Surface (mbgl) | Base Depth (mbgl) | LNAPL Surface (mbgl) | DNAPL Surface (mbgl) | Water Quality Indicators | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ORP (mV) | SPC (µs/cm) | C (µs/cm) | Ph (value) | DO (mg/L) | Dissolved Solids (ppt) | Resistivity (Ω·cm) | Temp (°C) | |
| BH02 | 3.30 | 3.40 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| BH01 | 3.40 | 6.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| WS08 | dry | 1.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| | | | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| | | | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |

**Notes** nt = not tested
nd = not detected

Data Compiled by: JTC
Data Checked by: NEB

# Tetra Tech
## LANDGAS AND GROUNDWATER MONITORING RESULTS

TETRA TECH

**Site Name:** Blaendulais
**Job No.:** B035256
**Client:** Neath Port Talbot Council

**Date Monitored:** 15/06/22
**Monitoring Engineer:** JM
**Weather:** clear, warm

**EQUIPMENT USED**

| Type | Make | Serial | Last Calibrated |
|---|---|---|---|
| **Gas Analyser** | **Landtec GA5000** | **G502044** | **Nov-21** |
| **Interface Meter** | **Solinst** | **122-004988-1** | **n/a** |
| | | | |

**LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS**

| Exploratory Hole No | Peak | | Steady | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CH_4$ (% vol) | $CO_2$ (% vol) | $CH_4$ (% vol) | $CO_2$ (% vol) | $O_2$ (% vol) | BAL (%) | PID (ppm) | $H_2S$ (ppm) | HCN (ppm) | CO (ppm) | Time | Remarks |
| BH02 | 0.1 | 0.2 | 0.1 | 0.2 | 20.8 | 78.9 | nt | 0 | nt | 0 | 09:00 | |
| BH01 | 0.1 | 0.4 | 0.1 | 0.4 | 16.9 | 82.9 | nt | 0 | nt | 0 | 09:30 | |
| WS08 | 0.1 | 0.5 | 0.1 | 0.5 | 20.4 | 79 | nt | 0 | nt | 0 | 10:00 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**LANDGAS - PHYSICAL PARAMETERS**

| Exploratory Hole No | Atmos Pressure (m bar) | Atmos Temp (°C) | BH Flow | | BH Pressure | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Peak (L/hr) | Steady (L/hr) | Peak (mbar) | Steady (mbar) | |
| BH02 | 998 | 16.0 | 0.1 | 0.1 | -0.12 | -0.05 | |
| BH01 | 998 | 16.0 | 0.2 | 0.2 | -0.17 | -0.17 | |
| WS08 | 998 | 16.0 | 0.2 | 0.2 | 0.12 | 0.12 | |
| | | | | | | | |
| | | | | | | | |

**AMBIENT ATMOSPHERIC CONDITIONS**

| Parameter | Before Monitoring | After Monitoring |
|---|---|---|
| $CH_4$ (% vol) | 0.1 | 0.1 |
| $CO_2$ (% vol) | 0.1 | 0.1 |
| $O_2$ (% vol) | 21.1 | 21.1 |
| PID (ppm) | nt | nt |
| Atmos Press. (m bar) | 998 | 998 |

**ATMOSPHERIC PRESSURE CONDITIONS**

| | |
|---|---|
| 3 days prior (m bar) | 1026 |
| 2 days prior (m bar) | 1028 |
| 1 day prior (m bar) | 1023 |
| during (m bar) am,midday,pm | 1019, 1020, 1019 |
| 1 day post (m bar) | 1018 |

**GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS**

| Exploratory Hole No | Water Surface (mbgl) | Base Depth (mbgl) | LNAPL Surface (mbgl) | DNAPL Surface (mbgl) | Water Quality Indicators | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ORP (mV) | SPC (µs/cm) | C (µs/cm) | Ph (value) | DO (mg/L) | Dissolved Solids (ppt) | Resistivity (Ω·cm) | Temp (°C) | |
| BH02 | DRY | 3.40 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| BH01 | 4.12 | 6.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| WS08 | DRY | 1.00 | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| | | | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |
| | | | nd | nd | nt | nt | nt | nt | nt | nt | nt | nt | |

**Notes** nt = not tested
nd = not detected

Data Compiled by: JM
Data Checked by: NEB

# Appendix E

# Photographic Plates


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
SA01
GL 1·20
200
300
400
600


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
SA02
DEPTH (M)
GL 1.00
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
SA03
DEPTH (M)
GL 0.90
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
TP01
DEPTH (M)
GL - 1.50
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP 02
DEPTH (M)
GL 0.40
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
2218
TP
TP03
DEPTH (M)
0-60
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
TP01
DEPTH (M)
GL - 0.70
FACE


19/2/25
PROJECT
PROJECT NO
22181
TP
TP05
DEPTH (M)
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
TP05
DEPTH (M)
GL 0.70
FACE


19/2/25
PROJECT
BLAGNOVLAIS ADD
PROJECT NO
22181
TP
TP06
DEPTH (M)
GL 1.00
FACE


PROJECT
PROJECT NO
TP
DEPTH (M)
FACE
22181
TP07
0.50


PROJECT
PROJECT NO
TP
DEPTH (M)
FACE


19/2/25
PROJECT
BLAGDONLANE ADD
PROJECT NO
22181
TP
TP09
DEPTH (M)
0.8
FACE


19/2/25
PROJECT
BLAGNOULAIS ADD
PROJECT NO
22181
TP
TP 10
DEPTH (M)
GL 1.10
FACE


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
WS01
DEPTH (M)
GL 1.50
FACE
NK 1.00 1.50


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
WS 02
DEPTH (M)
GL 1.30
FACE
100
200
300
400
500
600


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
WS03
DEPTH (M)
GL 0.90
FACE
100
200
300
500
600


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
WS 04
DEPTH (M)
GL 1.00
FACE
100
200
300
400
500
600


10/10/23
PROJECT
BLAENDULAIS
PROJECT NO
22181
TP
WS05
DEPTH (M)
GL 0.45
FACE
100
200
300
400
500
600

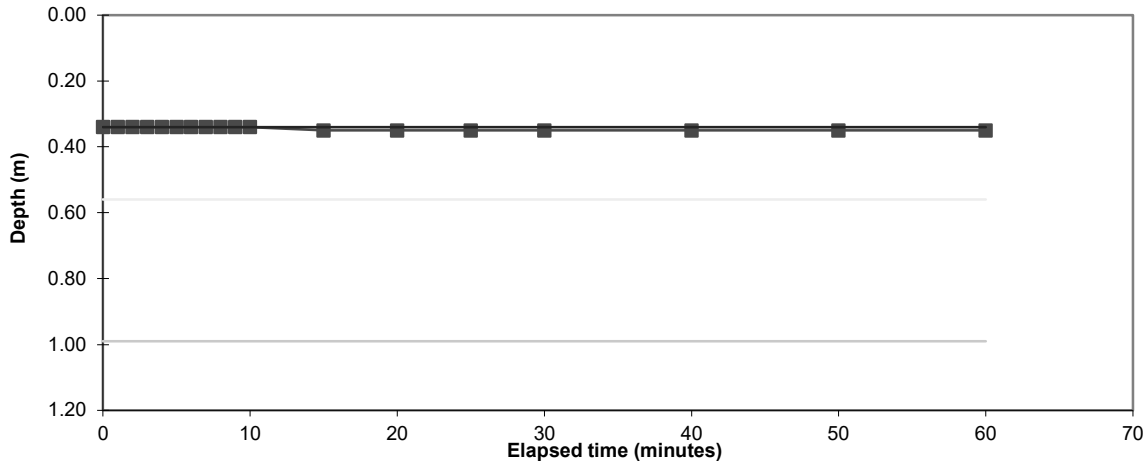
# Appendix F

# Soakaway Testing

# Soakaway Test Results

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | SA01 | Test No: | 1 | Date: | 10.10.2023 |
| Length (m): | 1.00 | | | | |
| Width (m): | 0.30 | Granular infill: | NA | | |
| Depth (m): | 1.20 | Porosity of infill: | 1 | (assumed) | |

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.34 | 30 | 0.35 |
| 1 | 0.34 | 40 | 0.35 |
| 2 | 0.34 | 50 | 0.35 |
| 3 | 0.34 | 60 | 0.35 |
| 4 | 0.34 | | |
| 5 | 0.34 | | |
| 6 | 0.34 | | |
| 7 | 0.34 | | |
| 8 | 0.34 | | |
| 9 | 0.34 | | |
| 10 | 0.34 | | |
| 15 | 0.35 | | |
| 20 | 0.35 | | |
| 25 | 0.35 | | |




| | | | |
|---|---|---|---|
| Water depth at start of test (m): | 0.34 | | |
| 75% effective depth (m): | 0.56 | Elapsed time (mins): | #N/A |
| 50% effective depth (m): | 0.77 | | |
| 25% effective depth (m): | 0.99 | Elapsed time (mins): | #N/A |
| Empty depth (m): | 1.20 | | |

Volume outflow between 75% and 25% effective depth ($m^3$):

Mean surface area of outflow ($m^2$): 1.42
(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

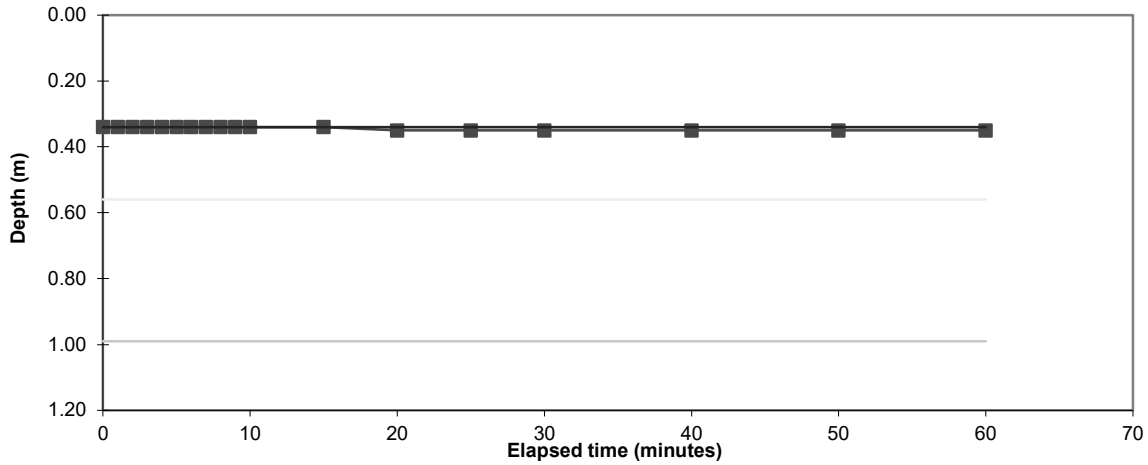
| | | | |
|---|---|---|---|
| Notes:<br>Results processed following BRE 365 (1991)<br>Water depths measured below ground level | **Project** | Blaendulais | **Figure** |
| | **Project No.** | 22181 | **SA1_01** |
| | **Carried out for** | TRJ | |

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA01 Test No: 2 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 1.20 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.34 | 30 | 0.35 |
| 1 | 0.34 | 40 | 0.35 |
| 2 | 0.34 | 50 | 0.35 |
| 3 | 0.34 | 60 | 0.35 |
| 4 | 0.34 | | |
| 5 | 0.34 | | |
| 6 | 0.34 | | |
| 7 | 0.34 | | |
| 8 | 0.34 | | |
| 9 | 0.34 | | |
| 10 | 0.34 | | |
| 15 | 0.34 | | |
| 20 | 0.35 | | |
| 25 | 0.35 | | |




Water depth at start of test (m): 0.34
75% effective depth (m): 0.56 Elapsed time (mins): #N/A
50% effective depth (m): 0.77
25% effective depth (m): 0.99 Elapsed time (mins): #N/A
Empty depth (m): 1.20

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.42
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

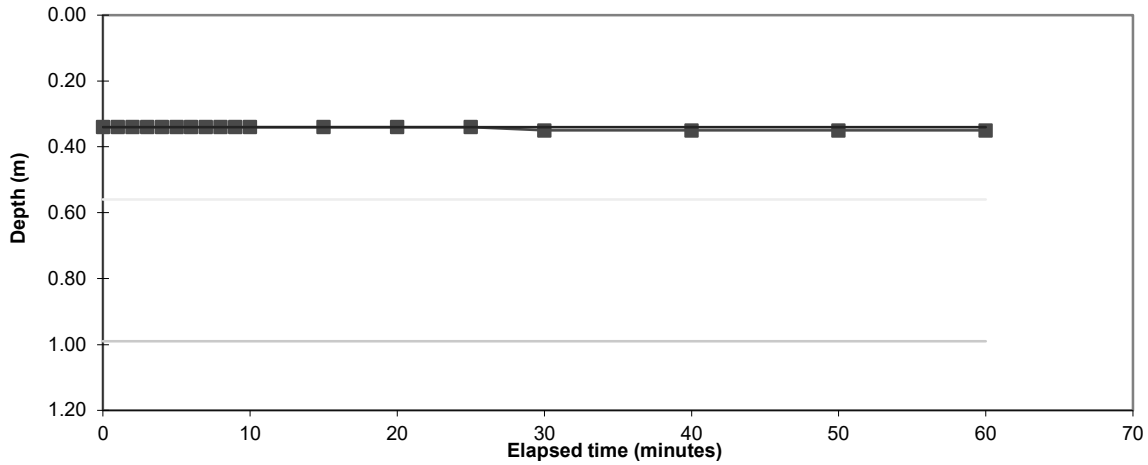
**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

**Figure** **SA1_02**

# Soakaway Test Results

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | SA01 | Test No: | 3 | Date: | 10.10.2023 |
| Length (m): | 1.00 | | | | |
| Width (m): | 0.30 | Granular infill: | NA | | |
| Depth (m): | 1.20 | Porosity of infill: | 1 | (assumed) | |

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.34 | 30 | 0.35 |
| 1 | 0.34 | 40 | 0.35 |
| 2 | 0.34 | 50 | 0.35 |
| 3 | 0.34 | 60 | 0.35 |
| 4 | 0.34 | | |
| 5 | 0.34 | | |
| 6 | 0.34 | | |
| 7 | 0.34 | | |
| 8 | 0.34 | | |
| 9 | 0.34 | | |
| 10 | 0.34 | | |
| 15 | 0.34 | | |
| 20 | 0.34 | | |
| 25 | 0.34 | | |




| | | | |
|---|---|---|---|
| Water depth at start of test (m): | 0.34 | | |
| 75% effective depth (m): | 0.56 | Elapsed time (mins): | #N/A |
| 50% effective depth (m): | 0.77 | | |
| 25% effective depth (m): | 0.99 | Elapsed time (mins): | #N/A |
| Empty depth (m): | 1.20 | | |

Volume outflow between 75% and 25% effective depth ($m^3$):

Mean surface area of outflow ($m^2$): 1.42
(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

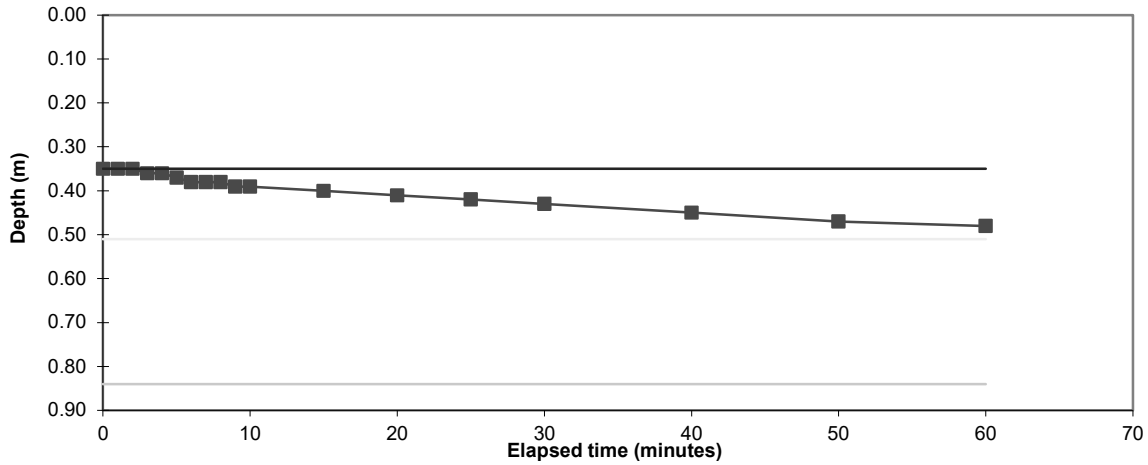
| | | | |
|---|---|---|---|
| Notes:<br>Results processed following BRE 365 (1991)<br>Water depths measured below ground level | **Project** | Blaendulais | **Figure** |
| | **Project No.** | 22181 | **SA1_03** |
| | **Carried out for** | TRJ | |

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA02 Test No: 1 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 1.00 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.35 | 30 | 0.43 |
| 1 | 0.35 | 40 | 0.45 |
| 2 | 0.35 | 50 | 0.47 |
| 3 | 0.36 | 60 | 0.48 |
| 4 | 0.36 | | |
| 5 | 0.37 | | |
| 6 | 0.38 | | |
| 7 | 0.38 | | |
| 8 | 0.38 | | |
| 9 | 0.39 | | |
| 10 | 0.39 | | |
| 15 | 0.40 | | |
| 20 | 0.41 | | |
| 25 | 0.42 | | |




Water depth at start of test (m): 0.35
75% effective depth (m): 0.51 Elapsed time (mins): #N/A
50% effective depth (m): 0.68
25% effective depth (m): 0.84 Elapsed time (mins): #N/A
Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.13
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

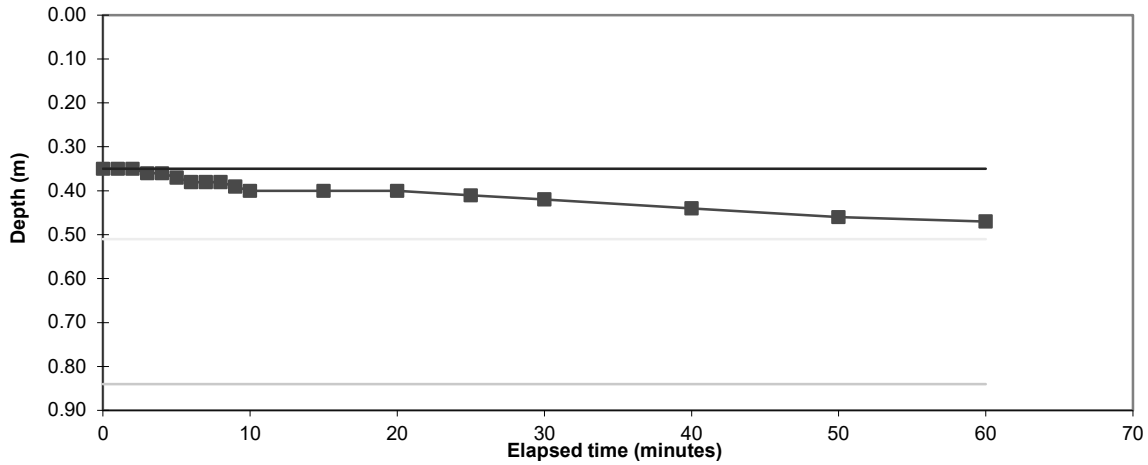
**Figure** **SA02_1**

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA02 Test No: 2 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 1.00 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.35 | 30 | 0.42 |
| 1 | 0.35 | 40 | 0.44 |
| 2 | 0.35 | 50 | 0.46 |
| 3 | 0.36 | 60 | 0.47 |
| 4 | 0.36 | | |
| 5 | 0.37 | | |
| 6 | 0.38 | | |
| 7 | 0.38 | | |
| 8 | 0.38 | | |
| 9 | 0.39 | | |
| 10 | 0.40 | | |
| 15 | 0.40 | | |
| 20 | 0.40 | | |
| 25 | 0.41 | | |




Water depth at start of test (m): 0.35
75% effective depth (m): 0.51 Elapsed time (mins): #N/A
50% effective depth (m): 0.68
25% effective depth (m): 0.84 Elapsed time (mins): #N/A
Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.13
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

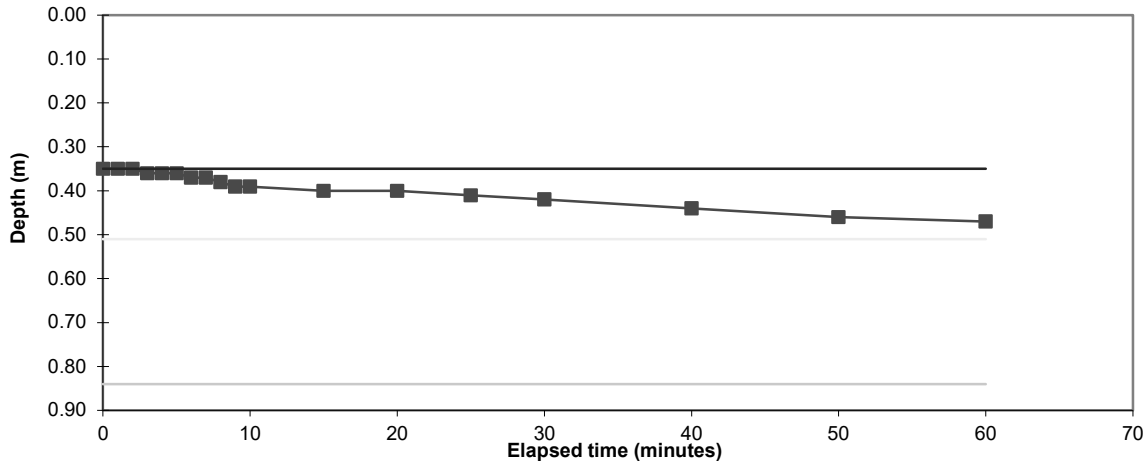
**Figure** **SA02_2**

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA02 Test No: 3 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 1.00 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.35 | 30 | 0.42 |
| 1 | 0.35 | 40 | 0.44 |
| 2 | 0.35 | 50 | 0.46 |
| 3 | 0.36 | 60 | 0.47 |
| 4 | 0.36 | | |
| 5 | 0.36 | | |
| 6 | 0.37 | | |
| 7 | 0.37 | | |
| 8 | 0.38 | | |
| 9 | 0.39 | | |
| 10 | 0.39 | | |
| 15 | 0.40 | | |
| 20 | 0.40 | | |
| 25 | 0.41 | | |




Water depth at start of test (m): 0.35
75% effective depth (m): 0.51 Elapsed time (mins): #N/A
50% effective depth (m): 0.68
25% effective depth (m): 0.84 Elapsed time (mins): #N/A
Empty depth (m): 1.00

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.13
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

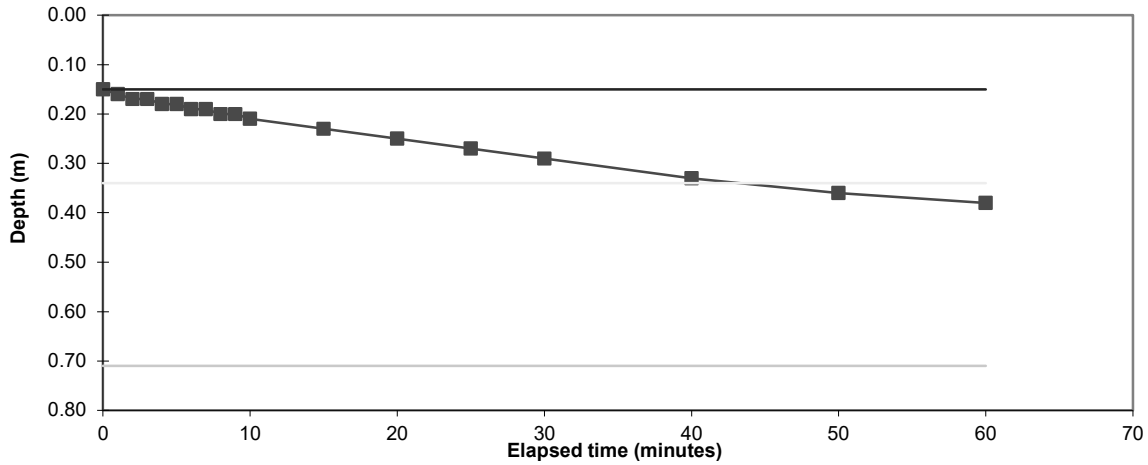
**Figure** **SA02_3**

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA03 Test No: 1 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 0.90 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.15 | 30 | 0.29 |
| 1 | 0.16 | 40 | 0.33 |
| 2 | 0.17 | 50 | 0.36 |
| 3 | 0.17 | 60 | 0.38 |
| 4 | 0.18 | | |
| 5 | 0.18 | | |
| 6 | 0.19 | | |
| 7 | 0.19 | | |
| 8 | 0.20 | | |
| 9 | 0.20 | | |
| 10 | 0.21 | | |
| 15 | 0.23 | | |
| 20 | 0.25 | | |
| 25 | 0.27 | | |




Water depth at start of test (m): 0.15
75% effective depth (m): 0.34 Elapsed time (mins): 43.3
50% effective depth (m): 0.53
25% effective depth (m): 0.71 Elapsed time (mins): #N/A
Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.26
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

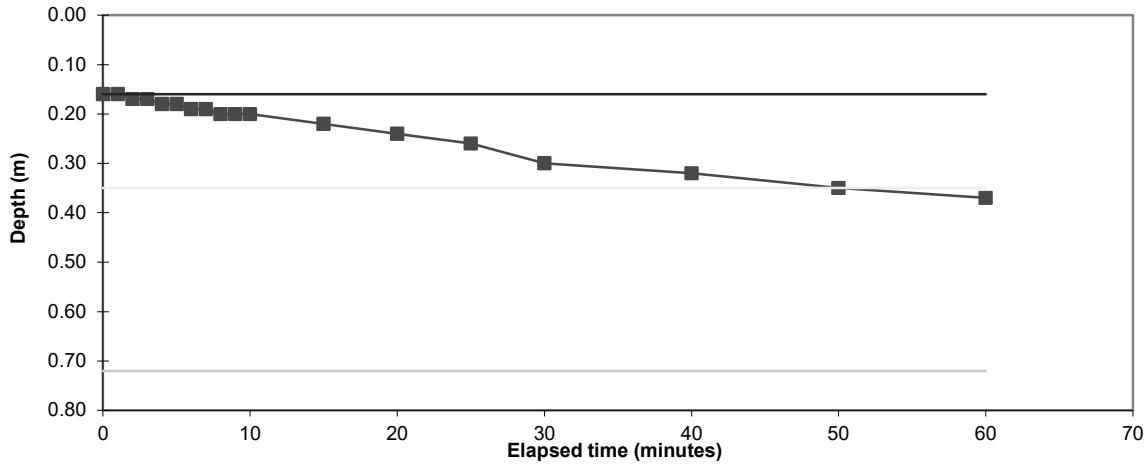
**Figure** **SA03_1**

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA03 Test No: 2 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 0.90 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.16 | 30 | 0.30 |
| 1 | 0.16 | 40 | 0.32 |
| 2 | 0.17 | 50 | 0.35 |
| 3 | 0.17 | 60 | 0.37 |
| 4 | 0.18 | | |
| 5 | 0.18 | | |
| 6 | 0.19 | | |
| 7 | 0.19 | | |
| 8 | 0.20 | | |
| 9 | 0.20 | | |
| 10 | 0.20 | | |
| 15 | 0.22 | | |
| 20 | 0.24 | | |
| 25 | 0.26 | | |




Water depth at start of test (m): 0.16
75% effective depth (m): 0.35 Elapsed time (mins): 50.0
50% effective depth (m): 0.53
25% effective depth (m): 0.72 Elapsed time (mins): #N/A
Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.26
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

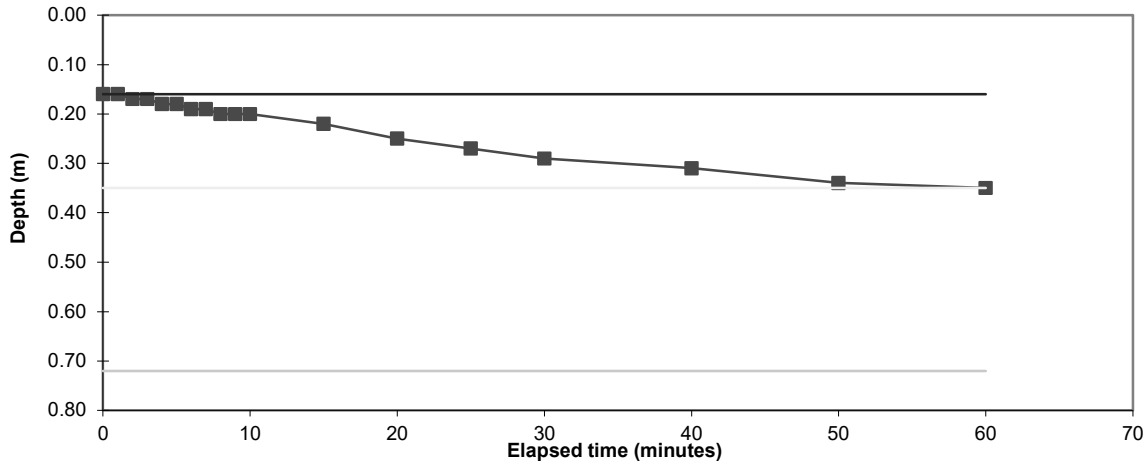
**Figure** **SA03_2**

# Soakaway Test Results

spectrum geo services

Trial Pit No: SA03 Test No: 3 Date: 10.10.2023
Length (m): 1.00
Width (m): 0.30 Granular infill: NA
Depth (m): 0.90 Porosity of infill: 1 (assumed)

| Elapsed time (minutes) | Water Depth (metres) | Elapsed time (minutes) | Water Depth (metres) |
|---|---|---|---|
| 0 | 0.16 | 30 | 0.29 |
| 1 | 0.16 | 40 | 0.31 |
| 2 | 0.17 | 50 | 0.34 |
| 3 | 0.17 | 60 | 0.35 |
| 4 | 0.18 | | |
| 5 | 0.18 | | |
| 6 | 0.19 | | |
| 7 | 0.19 | | |
| 8 | 0.20 | | |
| 9 | 0.20 | | |
| 10 | 0.20 | | |
| 15 | 0.22 | | |
| 20 | 0.25 | | |
| 25 | 0.27 | | |




Water depth at start of test (m): 0.16
75% effective depth (m): 0.35 Elapsed time (mins): #N/A
50% effective depth (m): 0.53
25% effective depth (m): 0.72 Elapsed time (mins): #N/A
Empty depth (m): 0.90

Volume outflow between 75% and 25% effective depth ($m^3$):
Mean surface area of outflow ($m^2$): 1.26
(side area at 50% effective depth + base area)
Time for outflow between 75% and 25% effective depth (mins):

**Soil infiltration rate (m/s):** **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate**

Remarks

Notes:
Results processed following BRE 365 (1991)
Water depths measured below ground level

**Project** Blaendulais
**Project No.** 22181
**Carried out for** TRJ

**Figure** **SA03_3**

# Appendix G

## Permit Closure Summary Form

The Coal Authority

# Permit Closure Summary Form

| Permit Ref. | 27301 | Project / Site Location | NPT Childcare Unit, High Street, Blaendulais, SA10 9DN |
|---|---|---|---|

***Please supply all relevant documents, including this completed form within 3 months of the permitted works being completed.***

Where relevant the report should include; borehole logs and details of mine or mine entry treatment works carried out (incl. engineering drawings, grout takes etc.) and a scaled site layout plan (correlated to O.S N' Grid) showing all relevant mine entry positions, coal seams, voids and broken ground proved by the works.

**Summary of works** **Start date** 29/9/23 **Finish date** 30/9/23

**Have any variations occurred?** ☑ No ☐ Yes **If so was the Authority notified?** ☐ No ☐ Yes

**Please describe;**

**Did if any of the following incidents occur?**

☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels)
☐ Geotechnical instability ☐ Legal issues incl. damage or potential claims ☑ **None**

**If yes, please detail each item;**

**Were any of the following encountered? Please give a brief summary of the works undertaken.**

☑ Intact coal only ☐ Broken ground ☐ Backfilled ground ☐ Voids

**Description;**

As anticipated thin coal (200mm/300mm) was noted beneath 22m depth. No loss of flush/ no collaped ground

**Will further works be necessary that require a Permit?** ☑ No ☐ Yes

**If yes, please describe, including any recommendations;**

| | |
|---|---|
| **Name:** R. GRIFFITH | **Email:** rob.griffiths@spectrumgeo.co.uk |
| **Company:** SPECTRUM GEO SERVICES LTD | **Tel:** 01656 723666 |