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Report No	Date
22177/R2	September 2023
Project	CWMAVON – SUPPLEMENTARY GROUND INVESTIGATION
Client	TRJ

Spectrum Geo Services
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Report No:	Date:
22177/R2	September 2023

Project:
CWMAVON – SUPPLEMENTARY GROUND INVESTIGATION

Issue Number	Status	Description of Amendments
1	Draft	

Report prepared by:	
Signed	September 2023

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1.0 INTRODUCTION

1.1 Introduction

Spectrum Geo Services (SGS) were commissioned by TRJ Ltd. to complete a review of existing GI data at a site at 91 Waun Wen Road, Cwmafan, Port Talbot, SA12 9ED. This review recommended further ground investigation operations, due to the fact that the building plans had required a change in footprint, due to a coal shaft buffer zone.

The site is located approximately 2.85km north of Port Talbot. The site is approximately 0.168ha in area and is centred on National Grid Reference (NGR) 278512, 192486. The approximate postcode of the site being SA12 9ED.

SGS had completed a review of previous data (22177_R1) dated June 2023, which noted the requirement to undertake further window sampling, trial pitting and probe holes at the site to confirm the ground conditions and the potential presence of shallow coal seams/workings.

1.2 Scope of Works

The objectives of this assessment are to investigate the near surface deposits by window sampling and pitting, and to drill 2 No rotary probe holes with water flush, to determine/confirm the present of coals and the potential presence of broken ground or open workings which may influence the development.

1.3 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.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any regulatory authorities for approval. Redevelopment sites in particular may have planning conditions attached in respect of contaminated land assessment. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to the regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all of the regulatory authority requirements.

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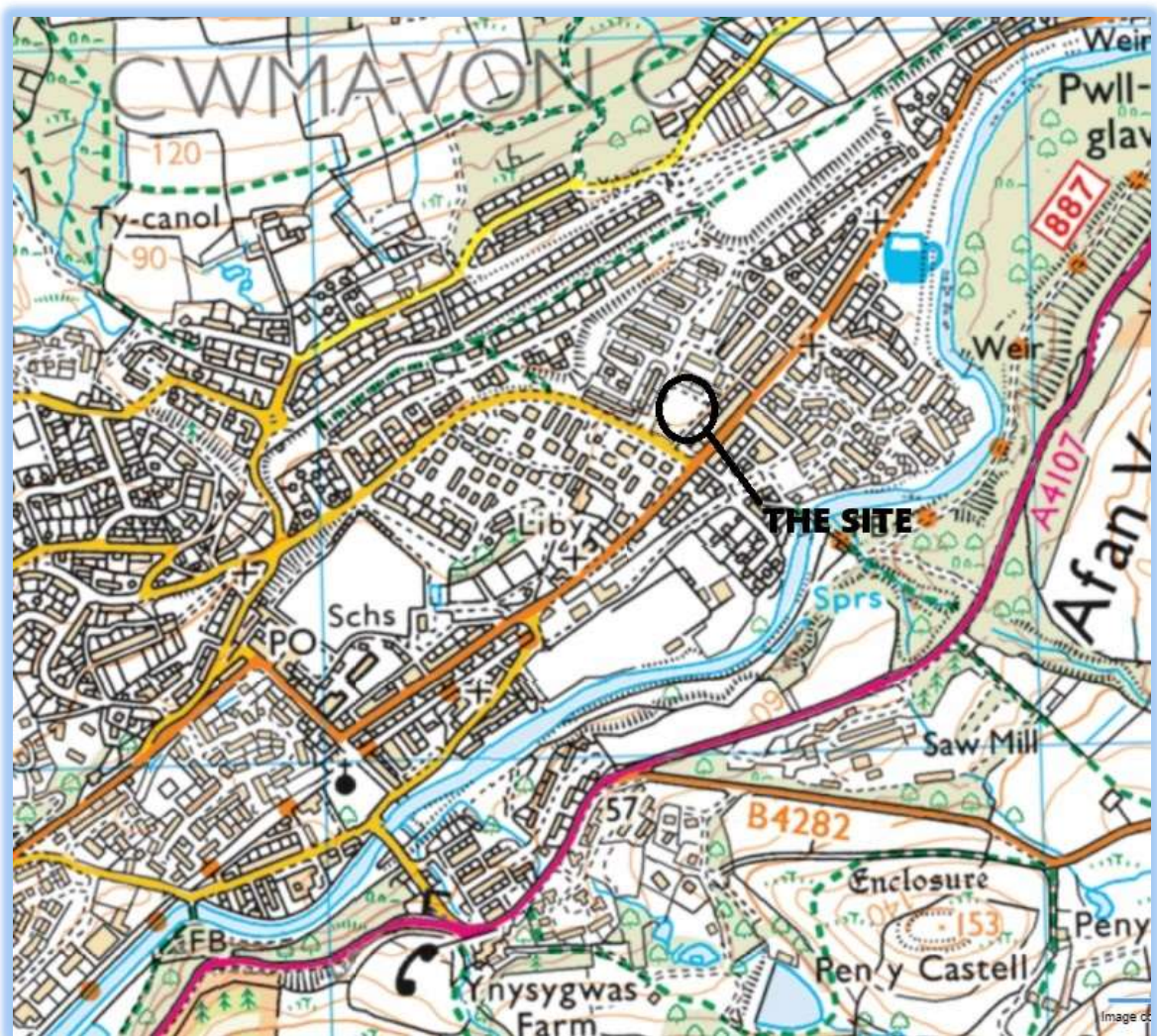
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2.0 EXISTING SITE INFORMATION

2.1 Site Location

The site is located at 91 Waun Wen Road, Cwmafan, SA12 9ED.

At the time of the investigation, the site comprised an open area of tarmacadamed car park as shown in Drawing 22177/01.



Drawing 22177/01.

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2.2 Published Geology

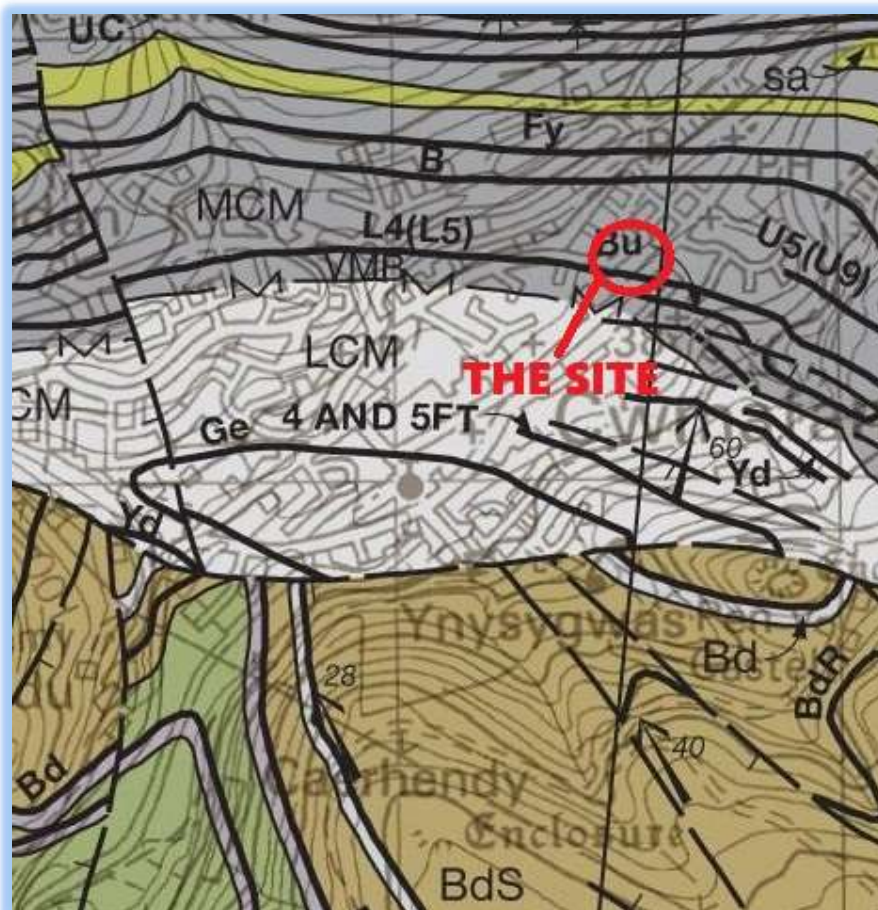
Information published by the British Geological Survey (BGS) suggests the site to be underlain by a sequence comprising;

Superficial Deposits

Alluvium - Clay, silt, sand and gravel. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period.

Bedrock Geology

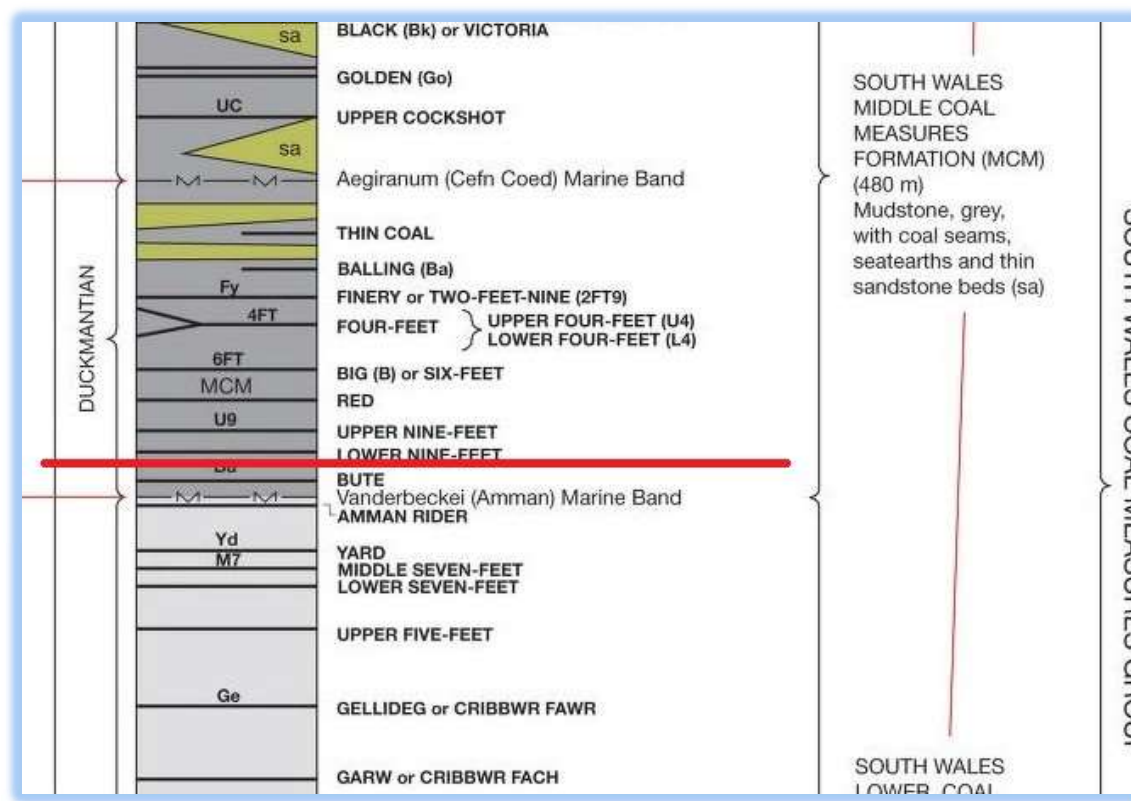
South Wales Middle Coal Measures Formation - Mudstone, siltstone and sandstone. Sedimentary bedrock formed between 318 and 309.5 million years ago during the Carboniferous period.



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Drawing 22177/02: Geological Setting



Drawing 22177/03: Geological Column

2.3 Hydrology

The site lies to the west of the River Avan, with elevated ground to the west. Thus, it is anticipated that the predominant groundwater flow is in an easterly westerly.

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3.0 SITE OPERATIONS

3.1 Site Works

Site works comprised window sampling, 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. The positions are shown on Drawing 22177/Locs.

100% water flush returns were noted by the driller during the rotary probing. On completion the holes were filled with bentonite grout, with no excessive take.

Borehole logs are shown in Appendix B.

4.0 DESK STUDY

4.1 Introduction

A desk study of the site was previously undertaken by Socotec, as noted in 22177_R1.

The SOCOTEC desk top study (DTS) and field reconnaissance report (Report No. H1060- 21) supplied by Neath Port Talbot County Borough Council outlined the following summary of the sites and its key risks.

The site is located adjacent to a former copper works and is shown on the historical mapping of the site (circa 1880) as well as a coal pit, coke ovens and gas works located to the west of the site. The eastern portion of the site historically consisted of gardens associated with the residential properties on Cunard Row. A number of tramways are also identified within the north west site boundary. By the 1920-1930s the tramway and an associated slag heap are labelled as disused and the residential properties of Cunard Row have been demolished. Re-profiling and restoration was undertaken in the 1970s and by the end of the decade the new residential properties of Waun Wen have been built and the area of the existing car park developed. These features persist today.

A mineshaft (7m north of the site boundary) and coal outcrop running through the site were identified during the DTS and represent two of the main risks associated with the redevelopment of the site and which the ground investigation has been commissioned to resolve. Due to the coal mining legacy issues there is a medium to high risk of geotechnical

hazards associated with the site and the historic industrial setting suggests a low to moderate risk of geo-environmental hazards.

The DTS also suggests that current and historic land uses will be sources of contamination including car parking, hard standing past mining, former tramways and former slag heaps.

4.2 Previous Ground Investigation

Tetra Tech undertook a Phase2 Ground Investigation. The works were undertaken on the same site, but in the eastern part of the car park, to accommodate an original development location.

The site investigation was undertaken between 16th and 19th May 2022. The scope of the investigation specified by Neath Port Talbot Council is based on the desk top study undertaken by SOCOTEC Report No. H1060-21 and included the following:

- Geophysical survey to locate mineshaft shown to be north of the site and outside the red line boundary.
- Clearance of buried services prior to excavation and the location and level of each exploratory hole location surveyed.
- Two combined dynamic sample, rotary core and rotary open hole boreholes to a depth of 30metres, with sampling and SPTs in the upper 10metres.
- Two days of windowless sampling to five metres, or refusal, with SPTs and samples.
- One day of soakaway testing in two trial pits not exceeding 1.5metres depth.
- Five TRL DCP test locations to obtain indicative CBR values around the site.
- Installation of gas/groundwater monitoring standpipes within the one borehole and two windowless samples and three return visits to measure gas/groundwater levels.
- On-site inspection and logging of recovered samples.
- Representative soil samples taken and submitted for geotechnical classification testing.

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- Representative soil samples submitted and tested for a suite of potential contaminants.

4.3 Coal Mining Risk Assessment (CMRA)

Tetra Tech undertook a CMRA. The risk assessment indicates that there is a Low to Moderate Risk of ground instability as a result of a recorded mine entry (shaft) being present on the northern site boundary. The nature of the backfill and cap is defined in the consultant's coal mining report and the location confirmed by Tetra Tech by the use of geophysical methods. A development exclusion zone was recommended to be placed around the mineshaft location.

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 Lower Nine Foot Top Leaf seam, in the eastern portion of the site.

4.4 Ground Contamination

The results of the Tetra Tech laboratory testing have indicated elevated Arsenic in two samples (WS04 and TP01) in Made Ground at concentrations which pose a potential risk to human health. The results have also indicated elevated heavy metal and PAH concentrations in soil derived leachate testing at concentrations which pose a potential risk to underlying groundwater. Due to access constraints (parked cars during monitoring) groundwater sampling could not be undertaken and as such the potential impact to groundwater cannot be discounted.

Based on the significant thickness of Made Ground noted across the site associated with the substantial industrial historical land use on site, the potential for localised previously unidentified contamination cannot be discounted.

4.0 SITE CONDITIONS ENCOUNTERED

4.1 Ground Conditions

Boreholes 5 and 6 noted a generalised succession as indicated in Table 5.1.

Stratum	Depth to base (m)	Remarks
MADE GROUND	(0.70) to (2.00)	Tarmac over sub-base over colliery and copperworks waste.
Medium to very dense SANDS and GRAVELS	(1.70) to 14.30	Alluvial
MUDSTONE	(30.00) to (31.00)	BH02 and 03
BH03 Coals	14.50-15.90, 27.90 – 28.50, 29.10 – 29.90	
BH0 Coal	23.80 – 24.60	BH2 and 3

Table 4.1. Generalised Strata

4.2 Groundwater Conditions

Water strikes were noted at between 3m and 3.20m depth, being deeper in the north of the site.

Monitoring of window sample and BH02 (previous investigations) noted water at 1.90m and 2.10m depths, as shown in GW1.

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.

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5.0 LABORATORY TESTING

Chemical laboratory testing was conducted to determine the concentrations of the following;

- Metals
- Asbestos
- pH and SO₄
- PAH MS
- TPH CWG
- WAC E 1 stage

The results are appended.



6.0 PRELIMINARY CONCEPTUAL MODEL AND QUALITATIVE RISK ASSESSMENT

Source Characterisation

All potential **on-site** and **off-site** sources of contamination identified by this desk study are detailed in Table 6.1.1 below. The table also details any which have been discounted.

Table 6.1. 1: Identified Potential Sources of Contamination

Source		Distance (m)	Compass Direction	Identified by:	Comments
Probable Made Ground	On-Site	0		Possible	Suite of contamination testing required to negate source.

It is not possible to discount all of the potential sources of contamination. Potential sources of contamination which cannot be discounted are carried forward to a preliminary qualitative risk assessment. The Contaminants of Concern (CoC) for the remaining potential sources of contamination are listed in Table 6.1.2.

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Table 6.1. 2: Contaminants of Concern

CONTAMINANTS OF CONCERN								
Source	Metals	Cadmium	PAH	Soil Organic Matter	SO ₄ , SO ₃	pH	Asbestos	Chromium IV
ON-SITE								
Made Ground	X	X	X	X	X	X	X	X

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.

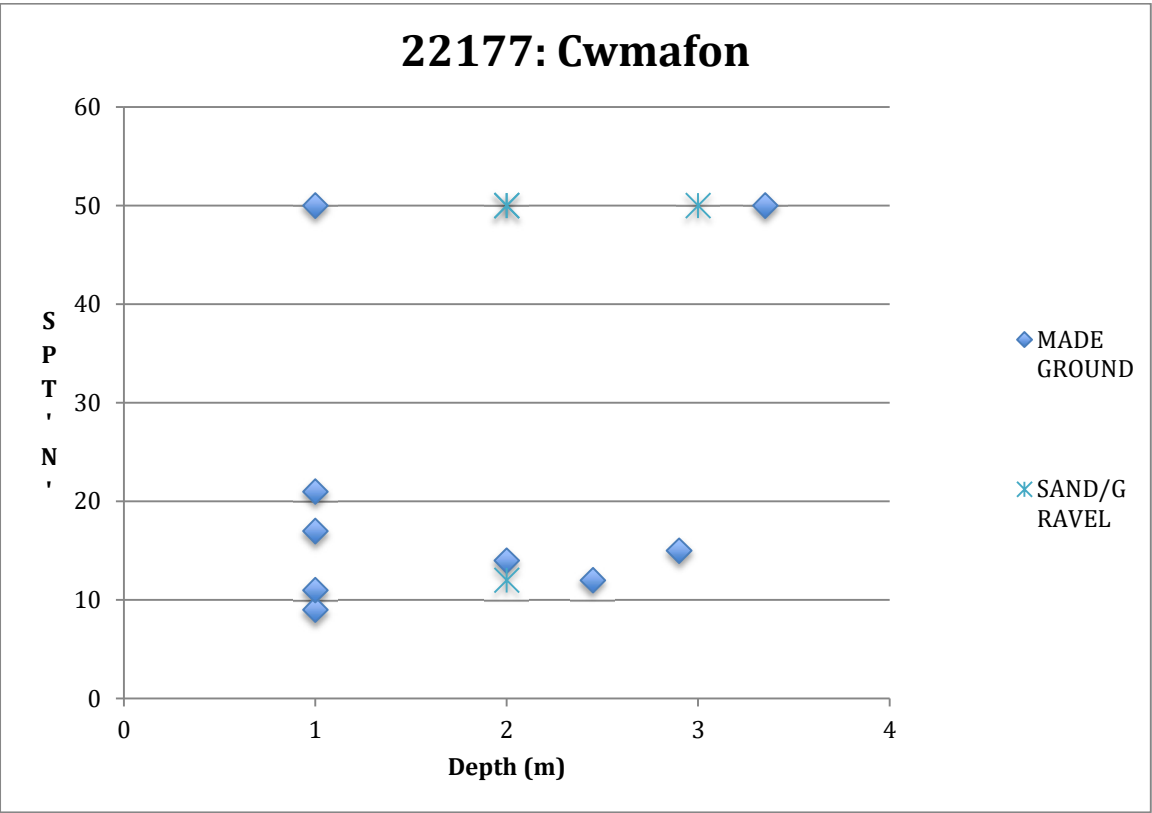


Figure 7.1. SPT N vs Depth

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7.1.1 Alluvial SANDS and GRAVELS

What has been described as medium dense to very dense SAND/GRAVEL with cobbles, was noted beneath the Made Ground.

The upper surface of the SAND/GRAVEL was noted at depths of between 1.50m and 1.80m (where it was possible to break through the Made Ground. The rotary holes noted deeper Made Ground, but the visual descriptions in the pits and window samples are considered more reliable.

The sand and gravels recorded SPT N values of between 12 and refusal. Allowing for the effects of overburden and correcting accordingly suggests the strata to be predominantly very dense.

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

- Angle of Internal Friction (ϕ') = 38°

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 1.50m to 2.00 the SAND and GRAVEL would provide an allowable bearing capacity (q_a) in the order of 150kN/m^2 , however care must be taken to inspect the stratum for loose or waterlogged zones.

Excavations in the Made Ground will degrade in wet conditions, and thus close support should be considered. Water was monitored as shallow as 1.90m 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.

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8.3 Attack to Buried Concrete

Laboratory testing during, noted slightly alkaline pH values, and a maximum acid soluble sulphate value of 480g/l, indicating Sulphate Class DS-1, in accordance with BRE Special Digest 1.

8.4 Groundwater

Groundwater was monitored at around 1.90m depth as described.

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 four samples, as shown in the Appendices.

Client Sample ID	Units	WS02	WS05	WS03	SA01		
Depth to Top		0.10	1.10	0.00	1.00		
Sample Type		Soil - ES	Soil - ES	Soil - ES	Soil - ES	S4UL/ C4SL Resi With	S4UL/ C4SL Resi Without
% Stones >10mm	% w/w	<0.1	<0.1	<0.1	<0.1		
pH	pH	8.08	7.98	7.28	7.67		
Sulphate (water sol 2:1)	g/l	<200	<200	480	<200		
Organic matter	% w/w	1	3.6	11.2	0.4		
Arsenic	mg/kg	5	5	27	4	37	40
Cadmium	mg/kg	0.6	0.7	1.1	0.7	11	65
Copper	mg/kg	9	14	44	11	2400	7100
Chromium	mg/kg	16	25	20	20	910	910
Chromium Hex	mg/kg	<1	<1	<1	<1	6	6
Lead	mg/kg	17	29	225	13	190	310
Mercury	mg/kg	<0.17	<0.17	<0.17	<0.17	40	56
Nickel	mg/kg	16	19	22	20	180	180
Zinc	mg/kg	35	43	201	41	3700	40000
TPH total (>C6-C40)	mg/kg	24	<10	138	30	48000	64000
Asbestos in Soil (inc. matrix)							
Asbestos in soil		NAD	NAD	NAD	NAD		
Asbestos ACM - Suitable for Water Absorption Test?		N/A	N/A	N/A	N/A	Non detected	

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PAH-16MS							
Acenaphthene	mg/kg	0.02	0.04	0.05	<0.01	1100	6000
Acenaphthylene	mg/kg	0.03	<0.01	0.04	<0.01	920	6000
Anthracene	mg/kg	0.16	0.04	0.14	0.04	11000	37000
Benzo(a)anthracene	mg/kg	1.61	0.18	0.81	0.35	13	15
Benzo(a)pyrene	mg/kg	1.59	0.16	0.89	0.35	3	3.2
Benzo(b)fluoranthene	mg/kg	2.39	0.25	1.31	0.52	3.7	4
Benzo(ghi)perylene	mg/kg	0.93	0.11	0.56	0.22	350	360
Benzo(k)fluoranthene	mg/kg	0.68	0.08	0.41	0.17	100	110
Chrysene	mg/kg	1.93	0.22	1.11	0.44	27	32
Dibenzo(ah)anthracene	mg/kg	0.38	<0.04	0.17	0.09	0.3	0.32
Fluoranthene	mg/kg	2.28	0.27	1.66	0.39	890	1600
Fluorene	mg/kg	0.03	0.03	0.04	<0.01	860	4500
Indeno(123-cd)pyrene	mg/kg	1.11	0.12	0.63	0.26	41	46
Naphthalene	mg/kg	<0.03	<0.03	0.04	<0.03	13	13
Phenanthrene	mg/kg	0.3	0.19	0.84	0.07	440	1500
Pyrene	mg/kg	1.76	0.2	1.29	0.31	2000	3800
Total PAH-16MS	mg/kg	15.2	1.89	9.99	3.21	17761	60984

2.5%SOM

Table 9.1: Contamination Results

The results have been compared with current Environment Agency limits for Commercial Uses. Table 11.1 shows the recorded values, related to current Soil Guideline Values (SGVs)/S4UL, or other published values.

Thus, it is evident that all positions were within guidelines for Residential with and without plant uptake. Thus, a remediation strategy is not required.

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10.0 COAL INVESTIGATION ASSESSMENT

The drilling operations noted in both this and the original phase of investigations, several relatively thin seams, which may be the Lower 9ft top leaf or the Bute. No workings were noted and no loss of flush recorded in any of the holes.

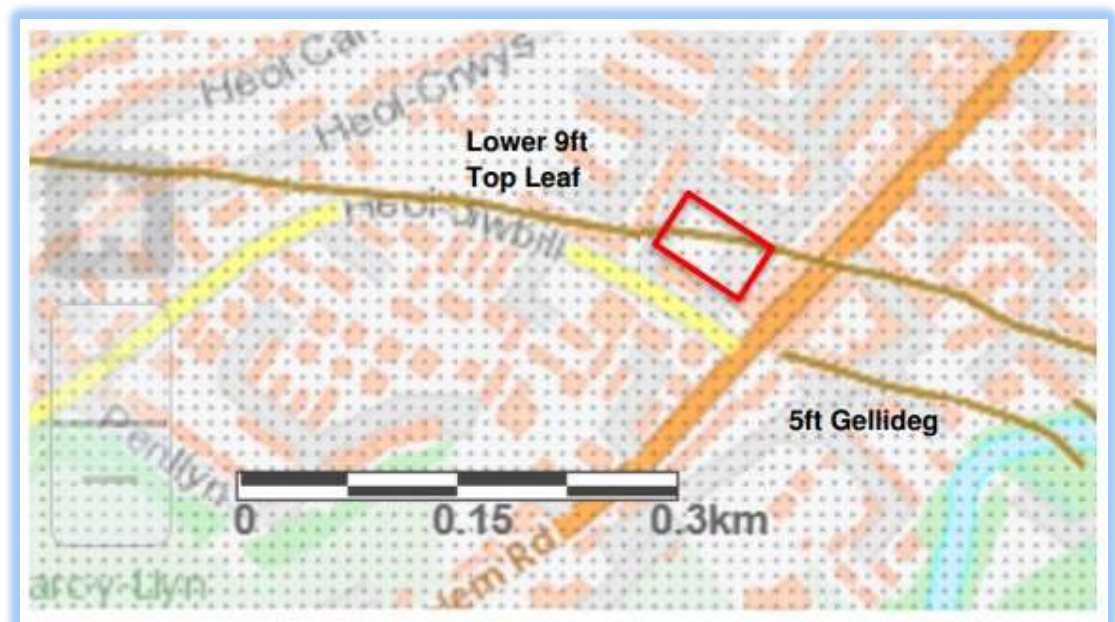


Fig 10: Geoindex Extract

Cross sections show the depth of the seams, and assume a 60 degree dip to the north.

This, combined with the knowledge that there was no flush take during the drilling, indicates that there are no workings within these seams, which in most would by their dimensions appear 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.

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APPENDIX A
Drawings

Borehole Location Plan	Drawing 22177_Locs
Geological Section Sketches	Drawing 22177_Sections

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APPENDIX B

Borehole Logs

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Appendix C

Laboratory Testing

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APPENDIX D

Groundwater Monitoring

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APPENDIX E

Photographic Plates

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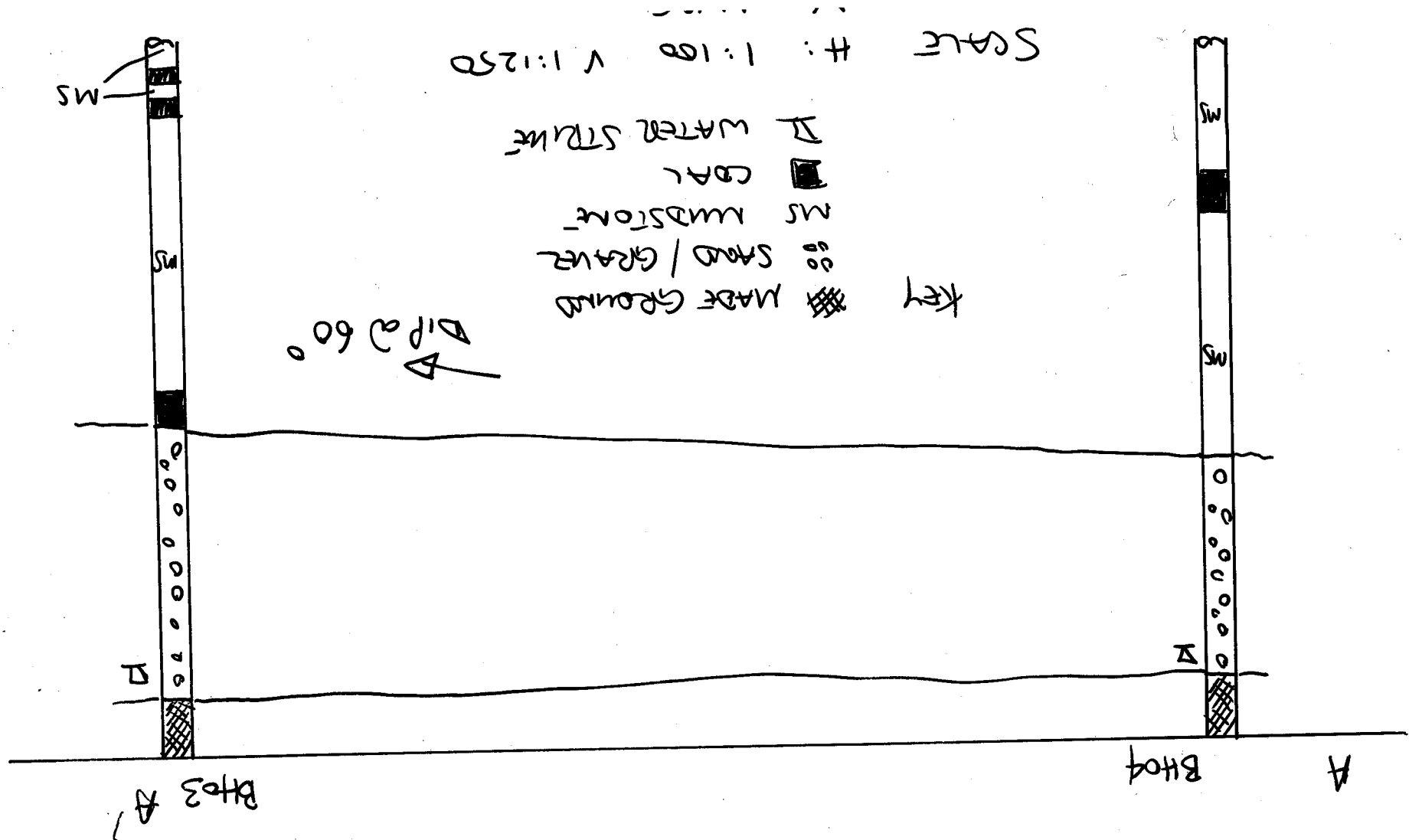
APPENDIX F

Permit Closure Summary Form

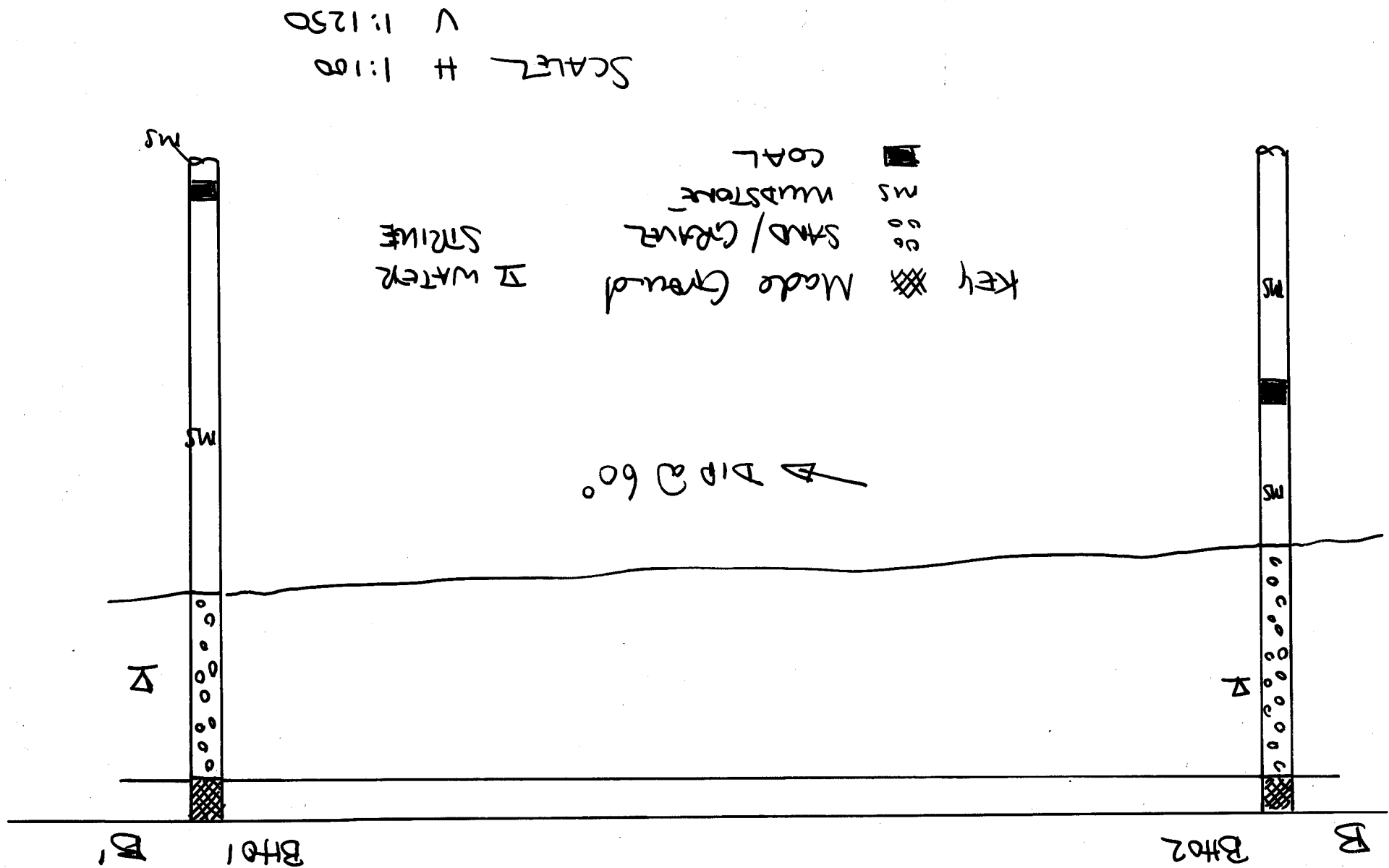
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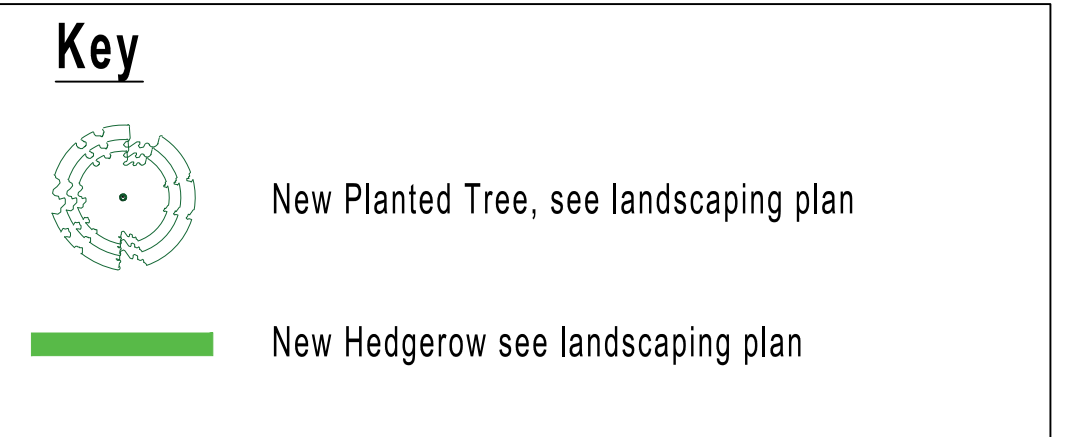


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- N1 Please confirm the external finishes.
Would you like Tarmac, Grass, Soft Play or a mixture?
- N2 Please confirm the addition of a main gate in the position shown as N2.
- N3 Please confirm the removal of the gate shown in the location of N3.
- N4 Please confirm the fencing style, height and colour.
The spec. states 1800mm high, Bow-Top hot dip galvanized with powder coated finish. Is this still the preferred choice?
- N5 Please confirm if there are any other boundary treatments required?
- N6 Please confirm if there will be any requirement for access control for gates, doors etc.
- N7 Please confirm the external finish of the parking and road into the site. Tarmac or paving?
- N8 Please confirm the external finish of the main pathway to the entrances. Tarmac, paving or soft play?
- N9 Please confirm the positioning of the new hedgerow and trees as shown on the site plan to enhance the ecology.

T. Richard Jones (BETWS) LTD
Foundry Road, Ammanford,
Carmarthenshire, SA18 2LS.
Tel: 01269 591103 Fax: 01269 596207
Email: enquiries@trjltd.co.uk

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Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP02	
Date		29.08.2023		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		
0.40-0.60	ES		GL - 0.05	1	MADE GROUND: Macadam		
1.20-1.40	ES		0.05 - 0.25	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.20 - 1.80	3	MADE GROUND: Black silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.2	m
				Width of Face B		0.3	m
				Remarks			
Method/plant				2.5 ton excavator			
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:				Logger's Signature			
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				PL			
ES Environmental Soil Sample							
EW Environmental Water Sample							

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Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP03	
Date		29.08.2023		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		
0.60-0.80	ES		GL - 0.05	1	MADE GROUND: Macadam		
			0.05 - 0.50	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.50 - 1.00	3	MADE GROUND: Grey and red subrounded COBBLES of fused slag with a little sand and gravel. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Burnt Furnace Material.		
			1.00 - 1.80	4	MADE GROUND: Black silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.3	m
				Width of Face B		0.3	m
				Remarks			
Method/plant				2.5 ton excavator			
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:				Logger's Signature			
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				PL			
ES Environmental Soil Sample							
EW Environmental Water Sample							

Superseded



Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP04	
Date		29.08.2023		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		
			GL - 0.05	1	MADE GROUND: Macadam		
			0.05 - 0.40	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.40 - 1.80	3	MADE GROUND: Black silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.3	m
				Width of Face B		0.3	m
				Remarks			
Method/plant				2.5 ton excavator			
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:				Logger's Signature			
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				PL			
ES Environmental Soil Sample							
EW Environmental Water Sample							

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Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP05	
Date		29.08.2023		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		
0.20-0.40	ES		GL - 0.05	1	MADE GROUND: Macadam		
1.40-1.80	ES		0.05 - 0.40	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.40 - 1.80	3	MADE GROUND: Black and grey ashy silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
			1.80 -		Brown and grey slightly clayey to clayey SAND AND GRAVEL. Sand is fine to coarse. GRAVEL is subrounded fine to coarse of sandstone and mudstone. ALLUVIUM.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.2	m
				Width of Face B		0.3	m
				Remarks			
Method/plant				2.5 ton excavator			
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:				Logger's Signature			
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				PL			
ES Environmental Soil Sample							
EW Environmental Water Sample							

Superseded



Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP06	
Date		29.08.2023		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		
0.40-0.60	ES		GL - 0.05	1	MADE GROUND: Macadam		
1.10-1.40	ES		0.05 - 0.30	2	MADE GROUND: Light grey sandy subangular fine to coarse GRAVEL of limestone. Sub-base		
			0.30 - 1.50	3	MADE GROUND: Black and grey ashy silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
			1.50 - 1.70	4	Brown and grey slightly clayey to clayey SAND AND GRAVEL. Sand is fine to coarse. GRAVEL is subrounded fine to coarse of sandstone and mudstone. ALLUVIUM.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.3	m
				Width of Face B		0.3	m
				Remarks			
Method/plant		2.5 ton excavator		A B C D			
Stability		Stable					
Shoring		None					
Weather		Raining					
Sample Type:							
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				Logger's Signature			
ES Environmental Soil Sample				PL			
EW Environmental Water Sample							

Superseded



Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP07	
Date		29.08.2023		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		
			GL - 0.05	1	MADE GROUND: Macadam		
			0.05 - 0.30	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.30 - 1.80	3	MADE GROUND: Black silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.3	m
				Width of Face B		0.3	m
				Remarks			
Method/plant				2.5 ton excavator			
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:				Logger's Signature			
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				PL			
ES Environmental Soil Sample							
EW Environmental Water Sample							

Superseded



Trial Pit/Trench Description

Project		Cwmavon		Project No		22177	
Described by		PL		Trial Pit No		TP08	
Date		29.08.2023		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		
0.30-0.70	ES		GL - 0.05	1	MADE GROUND: Macadam		
			0.05 - 0.25	2	MADE GROUND: Light grey sandy subangular fine to course GRAVEL of limestone. Sub-base		
			0.25 - 0.70	3	MADE GROUND: Red brown and grey subangular to subrounded COBBLES and BOULDERS of fused slag with a little sand and gravel. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Boulders are subrounded of fused slag. Burnt foundry material.		
Groundwater Observations				Strike of Face A			deg
None				Length of Face A		1.2	m
				Width of Face B		0.3	m
				Remarks		A B C D	
Method/plant				2.5 ton excavator		Unable to continue due to boulders in pit.	
Stability				Stable			
Shoring				None			
Weather				Raining			
Sample Type:							
U Undisturbed, P Piston, D Disturbed, B Bulk, W Water				Logger's Signature			
ES Environmental Soil Sample				PL			
EW Environmental Water Sample							

Superseded



Window Sampling Hole Journal

Inspection Pit Dimensions						Hand Vane: Raw Data						
Equipment or Rig Type						Type	Geonor		Pilcon		Impact	
							16		19		19	
						Size (mm)	20		33		33	
						25		Tick one box				
Window Sampling: Tube Driving Data												
Tube dia (mm)	Depth		Recovery (m)	Time (min:sec)	Casing depth (windowless)	Depth	Peak			Remoulded		
	From	To					1	2	3	1	2	3
87	GL	1.00	0.50									
77	1.00	2.00	0.10									
67	2.00	3.00	0.10									
						Pocket Penetrometer: Raw Data						
						Depth	1	2	3	4	5	6
All depths are m below ground level						Use GDMS data entry to input raw data to HoleBASE						
Samples			Strata				Installation Details					
Type	No.	Depth	SPT N	Description								
		1.00	21	GL - 0.05: MADE GROUND: Macadam								
				0.05 - 0.30: MADE GROUND: Light grey sandy subangular fine to coarse GRAVEL of limestone. Sub-base								
				0.03 - 1.00: MADE GROUND: Red brown and black sandy subangular to subrounded fine to coarse GRAVEL of slag. Burnt foundry material.								
				1.00 - 1.50: MADE GROUND: Medium dense grey angular to subangular COBBLES of slag. Burnt Furnace Material								
		2.00	12	1.50 - 3.00: No Recovery. Probably pushing a cobble								
		3.00	50/125									
						Backfill Details (if no installation)						
Key to soil samples: B = bulk D = tub L = liner ES = environmental soil												
Groundwater Strike		If Yes		Project		Project No						
None		Depth of strike	After 20 mins	Depth sealed	Cwmavon		22177					
Remarks				Operator		Date						
				SWGT		29.08.2023						
				Logger PL		Date						
						Hole No. WS12						

Superseded



Window Sampling Hole Journal

Inspection Pit Dimensions						Hand Vane: Raw Data						
Equipment or Rig Type						Type	Geonor		Pilcon		Impact	
						16		19		19		
						Size (mm)		20		33		33
						25		Tick one box				
Window Sampling: Tube Driving Data												
Tube dia (mm)	Depth		Recovery (m)	Time (min:sec)	Casing depth (windowless)	Depth	Peak			Remoulded		
	From	To					1	2	3	1	2	3
87	GL	1.00	0.60									
77	1.00	2.00	0.80									
						Pocket Penetrometer: Raw Data						
						Depth	1	2	3	4	5	6
All depths are m below ground level						Use GDMS data entry to input raw data to HoleBASE						
Samples			Strata				Installation Details					
Type	No.	Depth	SPT N	Description								
ES		1.60	17	GL - 0.05: MADE GROUND: Macadam								
		0.05 - 0.50: MADE GROUND: Light grey sandy subangular fine to coarse GRAVEL of limestone. Sub-base										
		1.00		0.50 - 1.60: MADE GROUND: Medium dense black silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Many fragments of glass and ceramics. Burnt and unburnt foundry material.								
		2.00		1.60 - 2.00: Medium dense becoming very dense grey and brown slightly clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone and mudstone. ALLUVIUM.								
			50/125									
						Backfill Details (if no installation)						
Key to soil samples: B = bulk D = tub L = liner ES = environmental soil												
Groundwater Strike		If Yes		Project		Project No						
None		Depth of strike	After 20 mins	Depth sealed	Cwmavon	22177						
Remarks					Operator	Date	Hole No.					
					SWGT	29.08.2023						
					Logger	PL	WS13					

Superseded



Window Sampling Hole Journal

Inspection Pit Dimensions						Hand Vane: Raw Data									
Equipment or Rig Type						Type	Geonor			Pilcon			Impact		
							16			19			19		
						Size (mm)			20		33		33		
						25		Tick one box							
Window Sampling: Tube Driving Data															
Tube dia (mm)	Depth		Recovery (m)	Time (min:sec)	Casing depth (windowless)	Depth	Peak			Remoulded					
	From	To					1	2	3	1	2	3			
87	GL	1.00	0.80												
						Pocket Penetrometer: Raw Data									
						Depth	1	2	3	4	5	6			
All depths are m below ground level						Use GDMS data entry to input raw data to HoleBASE									
Samples			Strata							Installation Details					
Type	No.	Depth	Depth	Description											
ES		0.30 1.00	0.60 50/265	GL - 0.05: MADE GROUND: Macadam											
				0.05 - 0.25: MADE GROUND: Light grey sandy subangular fine to coarse GRAVEL of limestone. Sub-base											
				0.25 - 1.00: MADE GROUND: Red brown and grey sandy subangular to subrounded fine to coarse GRAVEL of slag with low to medium cobble content of subangular slag. Burnt foundry material.											
											Backfill Details (if no installation)				
Key to soil samples: B = bulk D = tub L = liner ES = environmental soil															
Groundwater Strike		If Yes			Project							Project No			
None		Depth of strike	After 20 mins	Depth sealed	Cwmavon							22177			
Remarks					Operator			Date			Hole No.				
Very dense at 1.00m					SWGT			29.08.2023			WS14				
					Logger PL			Date							

Superseded



Window Sampling Hole Journal

[illegible]

Superseded



Window Sampling Hole Journal

Inspection Pit Dimensions						Hand Vane: Raw Data						
Equipment or Rig Type						Type	Geonor		Pilcon		Impact	
						16		19		19		
						Size (mm)		20		33		33
Window Sampling: Tube Driving Data						Tick one box						
Tube dia (mm)	Depth		Recovery (m)	Time (min:sec)	Casing depth (windowless)	Depth	Peak			Remoulded		
	From	To					1	2	3	1	2	3
87	GL	1.00	0.80									
77	1.00	2.00	0.70									
						Pocket Penetrometer: Raw Data						
						Depth	1	2	3	4	5	6
All depths are m below ground level						Use GDMS data entry to input raw data to HoleBASE						
Samples			Strata				Installation Details					
Type	No.	Depth	Depth	Description								
		1.00	11	GL - 0.05: MADE GROUND: Macadam								
				0.05 - 0.30: MADE GROUND: Light grey sandy subangular fine to coarse GRAVEL of limestone. Sub-base								
				0.30 - 1.60: MADE GROUND: Loose becoming medium dense multicoloured slightly silty SAND AND GRAVEL with low cobble content of subangular to subrounded slag and fire brick. Gravel is subrounded to rounded fine to coarse of slag, coke and coal. Fragments of glass and ceramics. Burnt and unburnt foundry material.								
				1.60 - 2.00: Dense becoming very dense brown and grey clayey SAND AND GRAVEL. Sand is fine to medium. Gravel is subrounded fine to coarse of sandstone and mudstone. ALLUVIUM.								
		2.00	50/125									
							Backfill Details (if no installation)					
Key to soil samples: B = bulk D = tub L = liner ES = environmental soil												
Groundwater Strike		If Yes			Project		Project No					
None		Depth of strike	After 20 mins	Depth sealed	Cwmavon		22177					
Remarks					Operator SWGT		Date 29.08.2023					
					Logger PL		Date					
							Hole No. WS16					

Superseded



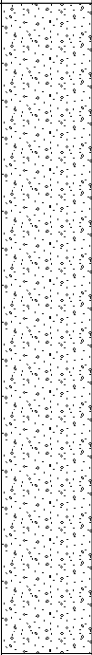
Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023 - 30/08/2023									
Location: Cwmavon				Contractor: Apex Drilling Services													
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG									
Borehole Number BH03		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 1 of 4							
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description						
				TCR	SCR	RQD											
	▼							0.30			MADE GROUND. Tarmac and Subbase.**	1					
											MADE GROUND. Backfill.**	2					
									2.60			Sand and Gravel.**	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																	
Rotary Open Hole																	

Superseded



Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023 - 30/08/2023									
Location: Cwmavon				Contractor: Apex Drilling Services													
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG									
Borehole Number BH03		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 2 of 4							
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description						
				TCR	SCR	RQD											
								14.30 14.50			Sand and Gravel.**	11					
												12					
												13					
												14					
												15					
												16					
												17					
												18					
												19					
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																	
Rotary Open Hole																	

Superseded



Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023 - 30/08/2023															
Location: Cwmavon				Contractor: Apex Drilling Services																			
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG															
Borehole Number BH03		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 3 of 4													
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description												
				TCR	SCR	RQD																	
											Mudstone.**	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																							
Rotary Open Hole																							

Superseded



Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023 - 30/08/2023				
Location: Cwmavon				Contractor: Apex Drilling Services								
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG				
Borehole Number BH03		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 4 of 4		
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
								31.00			Mudstone	
											End of Borehole at 31.000m	31
												32
												33
												34
												35
												36
												37
												38
												39
												40

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
Rotary Open Hole



Superseded



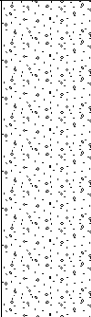
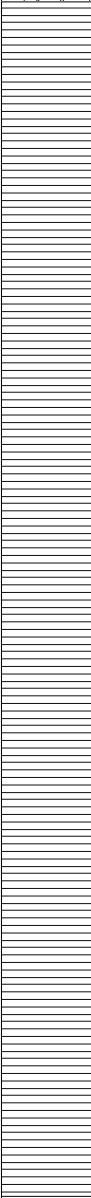
Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023									
Location: Cwmavon				Contractor: Apex Drilling Services													
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG									
Borehole Number BH04		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 1 of 3							
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description						
				TCR	SCR	RQD											
	▼							0.30			MADE GROUND. Tarmac and Subbase.**	1					
											MADE GROUND. Backfill.**	2					
													3				
									2.90			Sand and Gravel.**	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																	
Rotary Open Hole																	

Superseded



Rotary Core Log

Project Name: Cwmavon				Client: TRJ				Date: 29/08/2023													
Location: Cwmavon				Contractor: Apex Drilling Services																	
Project No. : 22177				Crew Name: TD/JB				Drilling Equipment: Fraste PLG													
Borehole Number BH04		Hole Type RO		Level		Logged By TD		Scale 1:50		Page Number Sheet 2 of 3											
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description										
				TCR	SCR	RQD															
								12.10			Sand and Gravel.**	11									
											Mudstone.**	12									
												13									
												14									
												15									
												16									
												17									
												18									
												19									
												20									
										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	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)				
Remarks Rotary Open Hole																					

Superseded

 Rotary Core Log																	
Project Name: Cwmavon						Client: TRJ						Date: 29/08/2023					
Location: Cwmavon						Contractor: Apex Drilling Services											
Project No. : 22177						Crew Name: TD/JB						Drilling Equipment: Fraste PLG					
Borehole Number BH04			Hole Type RO			Level			Logged By TD			Scale 1:50			Page Number Sheet 3 of 3		
Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description						
				TCR	SCR	RQD											
								23.80			Mudstone.**						21
																	22
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Superseded

Date : 30/08/2023		Meteorological and Site Conditions									
Operator: PL		State of ground		Dry							
		Wind		Light							
		Wind Direction									
		Cloud Cover		20%							
		Precipitation		0							
		Temperature(deg.C)		15.0							
		Barometric Presure (mb)									
Equipment Used:		Dipmeter 30m								Multigas Analyser	
Survey Information:											
BH	Depth (m)	O₂ (%v/v)	CH₄ (%v/v)	CO₂ (%v/v)	LEL (%)	AP mb	Flow (l/h)	DP (Pa)	Dip (m)		
WS04	1.94								DRY		
WS06	2.50								1.90		
BH02	30.00								2.10		
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.											
Groundwater Monitoring			Cwmavon			Project No: GW1 22177					

Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded



Superseded

Name: R GRIFFITHS		Company: SPECTRUM GEO SERVICES LTD	
Email: rob.griffiths@spectrums.co.uk		Tel: 01656 723666	

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

If yes, please describe, including any recommendations;

Several coal seams noted with no water or loss of water flow. Tally with expectation

Description; ☒ Intact coal only ☐ Broken ground ☐ Backfilled ground ☐ Voids

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

Did if any of the following incidents occur?

☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels) ☒ None

If yes, please detail each item;

Have any variations occurred? ☒ No ☐ Yes

If so was the Authority notified? ☐ No ☐ Yes

Please describe;

Summary of works

Start date 29/08/23 Finish date 30/08/23

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.

Permit Ref.	27085	Project / Site Location	Childcare Unit, Waun Wen, Cwmavon, Neath Port Talbot, SA12 9ED
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