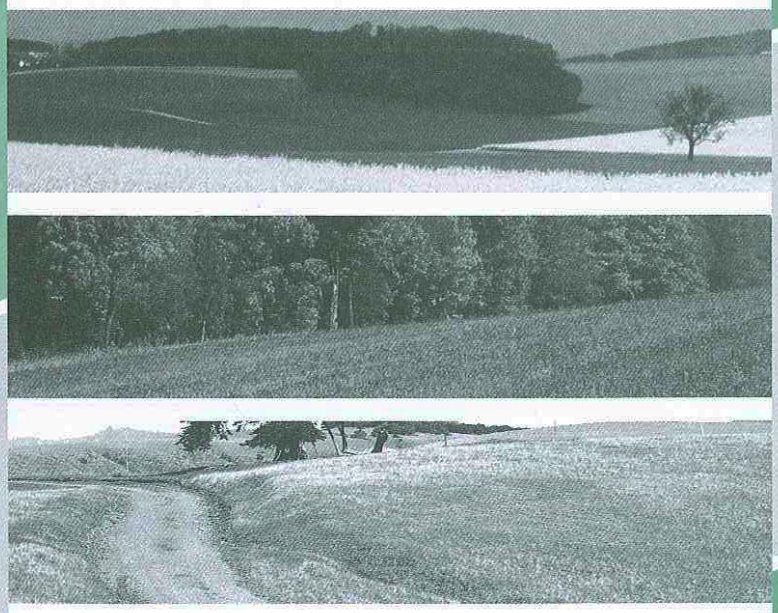
Intrusive Coal Mining Risk Assessment
Proposed Residential Development at Leiros Park, Rhydding, Neath

Prepared For:

Hale Construction Limited

September 2020

Job No: 14156-2



terrafirma

REPORT TITLE	**:**	**Intrusive Coal Mining Risk Assessment** Proposed Residential Development at Leiros Park, Rhydding, Neath
REPORT STATUS	**:**	**Final**
JOB NUMBER	**:**	**14156-2**
DATE	**:**	**September 2020**
PREPARED BY	**:**	**……..** **(Mr M. Watkins)**
REVIEWED BY	**:**	**……..** **(Mrs R. Howells)**
APPROVED BY	**:**	**……..** **(Dr G. C. Lake)**

Executive Summary

Site Location	*The site situates on field land to the north of the Rhydding area of Neath at a National Grid Reference of 275340 199030. It occupies an approximate plan area of 11.09 hectares.*
Proposed Development	*Hale Construction Limited is proposing a residential development with associated access roads, car parking areas, garden and landscaped areas.*
Summary of Geology and Mining	*The site is underlain by the Hughes Member of the Upper Coal Measures Formation. The north and southeast of the site are underlain by sandstone, and the central area of the site is underlain by bands of mudstones, siltstones and sandstones.* *The conjectural outcrop of the Mountain coal seam is shown crossing the middle of the site. The seam will therefore underlie the northern area of the site at shallow depth. A number of adits working the seam are shown in the area; the closest of which is located approximately 50m northeast of the site.* *The Generalised Vertical Section shows a thin coal seam that lies approximately 12.5m beneath the Mountain coal seam and therefore it too may underlie the site at shallow depth.* *The conjectured outcrop of the Garlant coal seam is located approximately 40m to the southeast of the site and approximately 54m below the Mountain coal seam.* *The Coal Authority report states that there are two seams of coal beneath the site with records of them having been worked; Hughes coal seam (62-82m depth) and Mynyddislwyn Lower Leaf (137m depth). The Coal Authority report also states that there is one coal outcrop on site. Whilst the Coal Authority record the seam as Darren Ddu; it is most likely referring to the Mountain coal seam, which outcrops through the site.* *The report also states that spine roadways are located at shallow depth.* *Ten mine entries are located within or within close proximity of the site boundary; two of which are located on site. A shaft is located roughly at the centre of the site, and another at the far west of the site.*
Site Work	*Nine rotary probeholes were sunk across the site using a Beretta T44 drilling rig to a maximum investigated depth of 30m. Air was used as the flushing medium.* *A series of trenches were excavated around the possible shafts. The 1.0m wide trenches were excavated at 1.0m intervals to a minimum of 10m radius around the purported shafts.*
Conclusion	*The Mountain coal seam was encountered in PH03, PH04, PH06, PH10, PH11, and PH13 to PH17 at the north of the site, varying between thicknesses of 0.3m and 2.1m. These probeholes confirm that the seam outcrops at the north of the site. No workings were recorded in the Mountain coal seam. It is therefore concluded that the seam is unlikely to be worked beneath the site and that the risk to the site from shallow workings in the seam is negligible.* *The unnamed thin coal seam was recorded at depths of 15.2-15.6m and 18.2-18.3m in PH01 and PH02 respectively and in some of the other probeholes it was not recorded where it would have been expected, indicating that the seam is intermittent. It is therefore considered that the risk to the site from shallow workings in the unnamed thin coal seam is negligible and that no further risk assessment is warranted.* *The Garlant coal seam was not encountered in any of the three probeholes that were sunk at the west of the site to a depth of more than 29m below rockhead. The risk to the site from shallow workings in the Garlant seam is negligible and no further assessment is warranted.* *No evidence of either shaft was encountered during the trial trenching. It is therefore considered that either the shafts do not exist, or they are located elsewhere on site. It is therefore recommended that construction workers should remain vigilant, particularly during the groundwork phase of the proposed development for any anomalies amongst the natural strata. If any such features are encountered, a qualified engineer should be contacted immediately.*

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SECTION 1 Introduction and Proposed Development

Hale Construction Limited is proposing a residential development with associated access roads, car parking areas, garden and landscaped areas at a site in the Rhydding area of Neath.

CB^3 Consult Limited is the Consulting Civil and Structural Engineer for the proposed development.

A Coal Mining Risk Assessment was previously undertaken at the site by Terra Firma (Report 14156 in June 2017).

It was recommended that an exploratory investigation be undertaken at the site to investigate the risk to the site from shallow workings beneath the site, and to locate two shafts that were identified at the site by The Coal Authority.

Terra Firma (Wales) Limited has been commissioned by Hale Construction Limited to undertake an Intrusive Coal Mining Risk Assessment for the site.

1.1 Limitations and Exceptions of Investigation

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

The report represents the findings and opinions of experienced geotechnical consultants. Terra Firma (Wales) Limited does not provide legal advice and the advice of lawyers may also be required.

The subsurface geological profiles are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

The following intrusive coal mining risk assessment is limited to 9 No. probeholes across the site due to budgetary constraints.

SECTION 2 Review of Existing Data

2.1 Physical Setting, Current Use and Site Conditions

The site situates on field land to the north of the Rhydding area of Neath at a National Grid Reference of 275340 199030. It occupies an approximate plan area of 11.09 hectares.

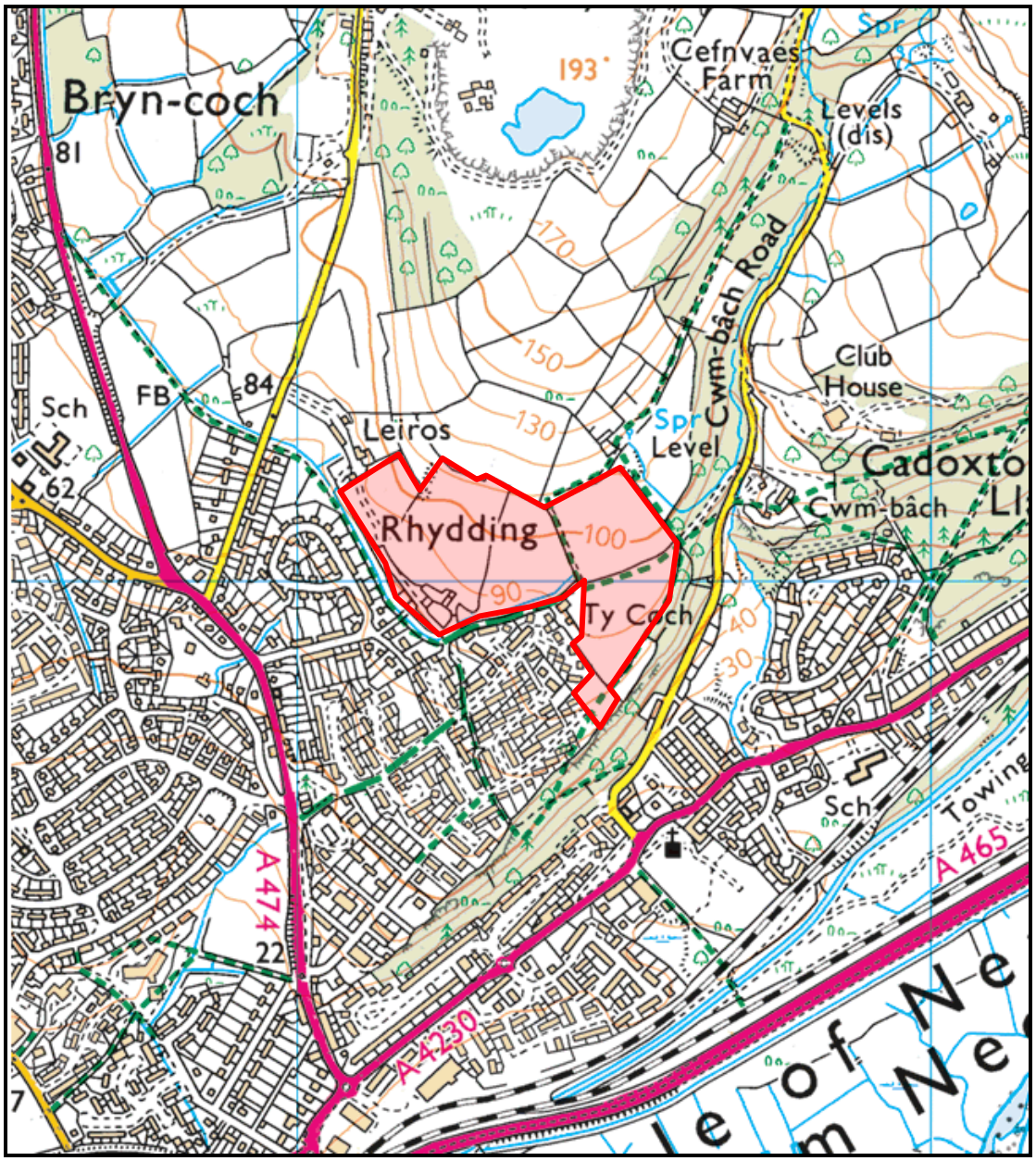


Figure 2.1: Site Location - OS Map

The site predominantly consists of fields, bounded by mature trees and hedgerows. A small parcel of land at the southwest of the site is occupied by old agricultural buildings and for storage and small scale agricultural use by local residents. A public right-of-way passes through the east of the site.

The far south of the site is covered by brambles and is separated from the remainder of the site by a damaged post and wire fence.

2.1 Physical Setting, Current Use and Site Conditions (Continued)

The site falls from approximately 115m AOD at the north, to approximately 90m AOD at the south, over a distance of approximately 200m.

The site is accessed from the southeast at the end of Daphne Road, or from the west at Gilfach Road via Leiros Farm.

The site is bound to the south and southwest by a large housing estate; to the north by fields; to the east by woodland; and to the northwest by Leiros Farm's buildings. The woodland to the east slopes very steeply from 84m AOD at the west, to 44m AOD to the east, over a horizontal distance of approximately 80m.

2.2 Geological and Mining History Summary

2.3.1 Geology

The 1:10,560 scale geological maps of the area (Sheets SS 79 NE) and the 1:50,000 scale geological map (Sheet 247) of the area was consulted.

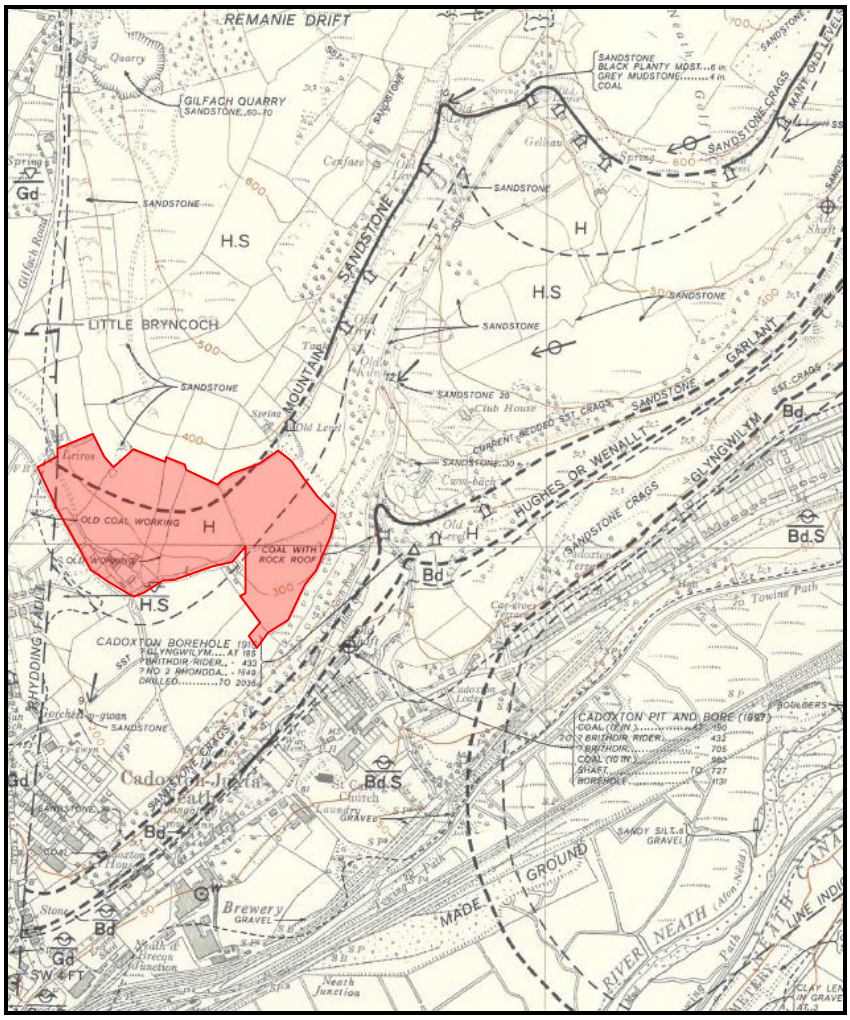


Figure 2.2: Extract from Geology Map (Sheet SS 79 NE)

The site is underlain by the Hughes Member of the Upper Coal Measures Formation. These sedimentary rocks were formed in the Carboniferous Period. The north and southeast of the site are underlain by sandstone, and the central area of the site is underlain by bands of mudstones, siltstones and sandstones.

The bedrock in this area is recorded as dipping to the north and west at between 9° and 12°.

The conjectural outcrop of the Mountain coal seam is shown crossing the middle of the site. The seam will therefore underlie the northern area of the site at shallow depth. A number of adits working the seam are shown in the area; the closest of which is located approximately 50m northeast of the site.

The Generalised Vertical Section shows a thin coal seam that lies approximately 12.5m beneath the Mountain coal seam and therefore it too may underlie the northern area of the site at shallow depth.

2.3.1 **Geology** (Continued)

The conjectured outcrop of the Garlant coal seam is located approximately 40m to the southeast of the site and approximately 54m below the Mountain coal seam. A number of adits and shafts show that the seam is commonly worked in the area. Based upon the recorded dip of the bedrock, the Garlant coal seam may lie at shallow depth beneath the south-eastern portion of the site.

The Bodwr coal seam (2ft to 3ft 6 in.) lies approximately 18m beneath the Garlant, and the Hughes (3ft to 4ft) another 18m beneath the Bodwr. Both seams are likely to have been worked however they should lie at sufficient depth to not affect ground stability at the surface.

Various shafts, adits and 'old coal workings' are shown in close proximity to the site.

The north to south orientated Rhydding Fault crosses the far west of the site; down throwing to the west.

No superficial deposits are recorded on the site; however, a small area of Glacial Till is located to the immediate southwest of the site.

2.3.2 Mining

A Coal Authority Mining Report was obtained for the site and is presented in **Annex A.**

The report states that there are two seams of coal beneath the site with records of them having been worked; Hughes coal seam (62-82m depth) and Mynyddislwyn Lower Leaf (137m depth). The Coal Authority report also states that there is one coal outcrop on site. Whilst the Coal Authority record the seam as Darren Ddu; it is most likely referring to the Mountain coal seam, which outcrops through the middle of the site.

The report also states that spine roadways are located at shallow depth.

Ten mine entries are located within or within close proximity of the site boundary; two of which are located on site. A shaft is located roughly at the centre of the site, and another at the far west of the site.

The Coal Authority do not hold records describing how the mine entries were treated.

During the site walkover, a local resident who rents a small parcel of the site for agricultural/recreational use stated that an unknown hole was located within close proximity to old agricultural buildings; as described in Section 2.1. A tractor wheel had been placed over the hole to stop children or animals from falling into it.

Beneath the wheel was a water-filled void with wooden and metal beams spanning across it. The water level was recorded at around 1.0m depth below ground level. The shape, depth or diameter of the structure could not be established.

Whilst the Coal Authority do not hold records of a shaft in this area of the site, the possibility of this structure being a shaft cannot be discounted.

The approximate location of the unknown structure is presented on **Figure 2.3**.

2.3.2 **Mining** (Continued)

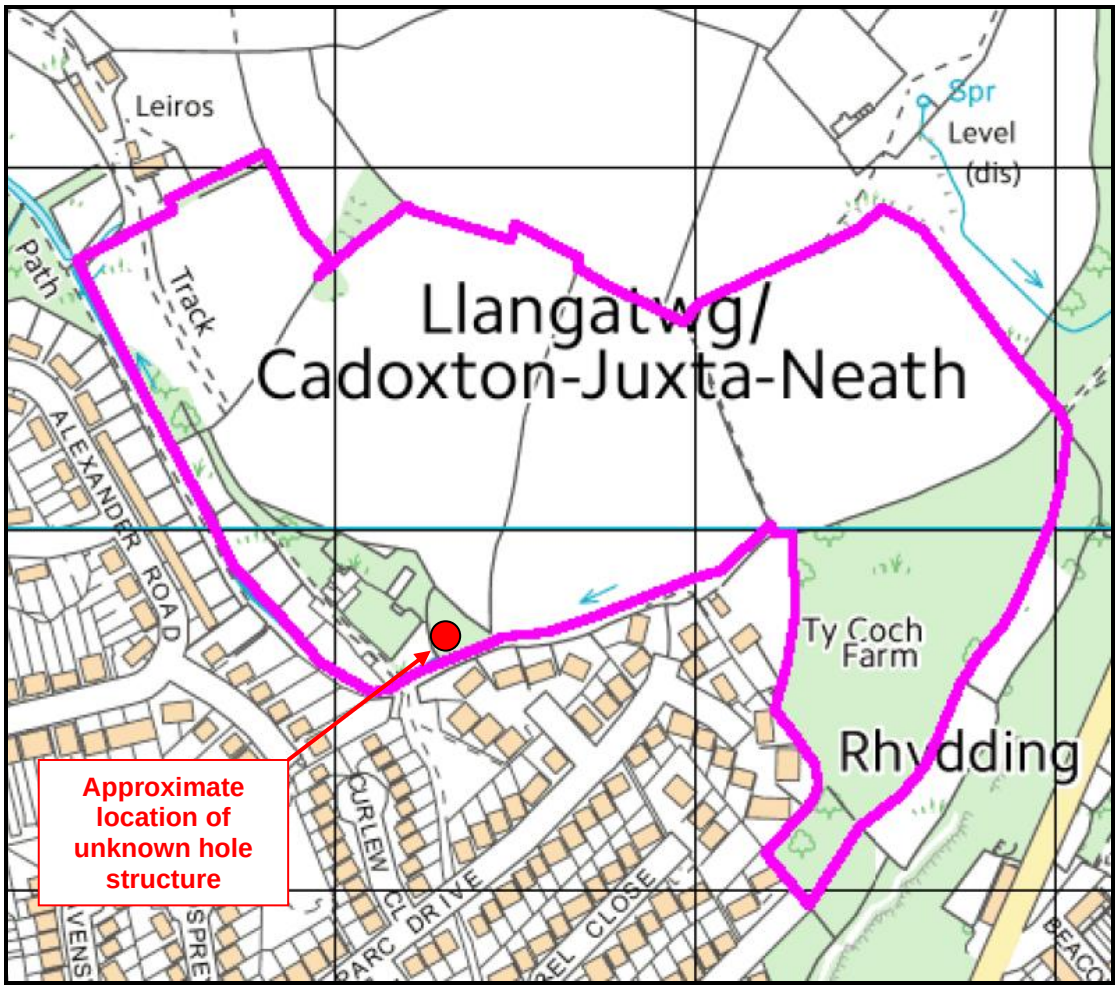


Figure 2.3: Approximate position of unknown hole structure

SECTION 3 Field Investigation

3.1 Site Work

Given the potential risk to the site from past unrecorded shallow mining and mine entries, it was recommended that an exploratory investigation be undertaken at the site.

Nine rotary probeholes were sunk across the site using a Beretta T44 drilling rig to a maximum investigated depth of 30m from Tuesday 29th to Thursday 31st August 2017. Air was used as the flushing medium.

A second phase of drilling involving eight rotary probeholes to a depth of up to 20m was undertaken from Monday 14th to Wednesday 16th September 2020. Air flush was again used as the flushing medium.

Summaries of ground conditions within the probeholes were made by reference to the drillers and an examination of the flush returns.

The co-ordinates of the apparent mine shafts that were provided by The Coal Authority were used to plot out the centres of each shaft. A series of 1m wide trenches were excavated at 1m intervals to a minimum of 10m radius around the assumed positions of the shafts. The trenches were excavated using an 8-tonne mechanical excavator on Wednesday 30th and Thursday 31st August, and Friday 14th September 2017.

The fieldworks were supervised by a Terra Firma (Wales) Limited engineer.

The probehole logs are presented in **Annex B.** Their positions are illustrated on **Drawing 01**.

3.2 Rotary Probeholes

A summary of the probehole logs; sunk to investigate shallow workings beneath the site is presented in **Table 3.1** below. The summary details the occurrence of coal. No backfilled workings, voids, or 'soft drill' was encountered.

Table 3.1 Summary of Coal Seam Depths

Location	Depth to Bedrock (m)	Depth of Coal Seam (m)	Thickness (m)
PH01	3.9	15.2-15.6 (coal)	0.4
PH02	4.2	18.2-18.3 (coal)	0.1
PH03	5.6	12.6-14.7 (coal)	2.1
PH04	3.9	10.2–11.6 (coal)	1.4
PH05	1.8	-	-
PH06	1.4	1.4-1.7	0.3
PH07	0.6	-	-
PH08	0.3	-	-
PH09	0.45	-	-
PH10	1.6	16.7-17.1	0.4
PH11	2.8	15.6-16.0	0.4
PH12	1.8	-	-
PH13	1.5	14.3-15.3	1.0
PH14	4.5	11.4-12.6	1.2
PH15	1.5	8.2-9.3	1.1
PH16	1.2	6.0-7.0	1.0
PH17	1.0	3.7-4.5	0.8

3.3 Trial Trenches

A series of trial trenches were excavated around the two supposed shafts as described in **Section 3.1**.

At Shaft 275199-027, the trenches were taken up to the mature hedgerow with well-established oak trees, which was located as close as 8m to the published co-ordinates. The hedgerow was at least 3m in thickness.

The exploratory investigation was supervised on a full-time basis by an Engineer from Terra Firma (Wales) Limited.

3.3.1 Shaft 275199-027

The ground conditions encountered by the trial trenches around Shaft 275199-027 can in general be summarised as shown in **Table 3.2**.

Table 3.2 Summary of Ground Conditions at Shaft 275199-027

Depth (m)			Thickness (m)	Stratum
GL	-	0.2/0.4	0.2/0.4	Grass over brown organic-rich silty slightly gravelly **SAND**. Gravel is angular sandstone.
0.2/0.4	-	0.4/0.6	0.2/0.4	Dense orangish brown silty very sandy **GRAVEL** with high cobble content.
0.4/0.6	-	>0.8	-	Grey **SANDSTONE ***.

*Three pockets of broken sandstone were encountered within 4m of the published co-ordinates were excavated to 1.5-2.0m depth, whereupon competent sandstone was encountered. These pockets were up to 1.5m in diameter.

A fourth larger pocket of broken sandstone, recovered as damp grey and brown very sandy gravel with high cobble and medium boulder content was encountered within 3m of the published co-ordinates. This anomaly was 2.5m x 2.0m at the surface, and narrowed with depth. The anomaly was excavated to 2.5m depth, at which point the excavation was terminated due to very slow progress due to what is believed to be competent sandstone. No anthropogenic material was encountered in any of the four anomalies.

3.3.2 Shaft 275199-026

The ground conditions encountered by the trial trenches around Shaft 275199-026 can in general be summarised as shown in **Table 3.3**.

Table 3.3 Summary of Ground Conditions at Shaft 275199-026

Depth (m)			Thickness (m)	Stratum
GL	-	0.1	0.1	Grass dark brown organic-rich silty gravelly **SAND** with many roots, rootlets and organic matter. Gravel is angular sandstone.
0.1	-	0.3/>1.7	0.2/>1.6	Brown silty gravelly **SAND** / brown and grey slightly sandy slightly gravelly **CLAY**.
0.3/>1.7	-	>2.6	-	Grey **SANDSTONE** recovered as grey cobbles and boulders of angular and tabular sandstone / very stiff grey and black slightly sandy slightly gravelly **CLAY***.

*A band of very stiff dark grey and black slightly sandy slightly gravelly clay was encountered from 1.0m depth. The gravel is fine. The gravel and coarse sand are angular fragments of coal. No anthropogenic material was encountered within the clay. This band of clay is interpreted as being a weathered coal seam. No further anomalies were encountered.

SECTION 4 Assessment of The Risk from Past Shallow Coal Workings & Mine Entries

4.1 Identified Shallow Coal Seams

The site investigation shows the following generalised strata:

- Superficial deposits
- Sandstone (Hughes Member)
- **Mountain coal seam (intact)**
- Mudstone (Hughes Member)
- **Unnamed thin coal seam (intact)**
- Mudstone (Hughes Member)
- Sandstone (Hughes Member)

Based upon the information gathered by the probeholes, it is considered that two seams of coal were encountered.

4.1.1 Mountain Coal Seam

The Mountain coal seam was encountered in PH03, PH04, PH06, PH10, PH11, and PH13 to PH17 at the north of the site, varying between thicknesses of 0.3m and 2.1m. These probeholes confirm that the seam outcrops at the north of the site.

No workings were recorded in the Mountain coal seam. It is therefore concluded that the seam is unlikely to be worked beneath the site and that the risk to the site from shallow workings in the seam is negligible.

4.1.2 Unnamed Thin Coal Seam

The other coal seam that was encountered is interpreted as being the unnamed thin coal seam. The seam was recorded at depths of 15.2-15.6m and 18.2-18.3m in PH01 and PH02 respectively. It is considered that the seam thins out in PH03, PH04 and PH06 where it is expected to underlie the Mountain coal seam by approximately 12m.

Based upon the thickness of the coal seam and the lack of evidence that the seam has been mined in the local area, it considered that the risk to the site from shallow workings in the unnamed thin coal seam is negligible and that no further risk assessment is warranted.

4.1.3 Garlant Coal Seam

The Garlant coal seam was not encountered in any of the three probeholes that were sunk at the west of the site to a depth of more than 29m below rockhead. It is therefore considered that there is sufficient rockhead cover above workings associated with the Garlant coal seam.

The risk to the site from shallow workings in the Garlant seam is negligible and no further assessment is warranted.

4.2 Mine Entries

No evidence of either shaft was encountered during the trial trenching. It is therefore considered that either the shafts do not exist, or they are located elsewhere on site. It is therefore recommended that construction workers should remain vigilant, particularly during the groundwork phase of the proposed development for any anomalies amongst the natural strata. If any such features are encountered, a qualified engineer should be contacted.

It is also recommended that the possible shaft at the south of the site should be investigated prior to any development in that area. Due to time and budgetary constraints, and the possibility of making the existing area unsafe by destabilising the hole, it was not investigated by exploratory means.

ANNEX A
Coal Authority Mining Report

The Coal Authority

Resolving the impacts of mining

Non-Residential Coal Mining Consultants Report

LEIROS PARK, BRYNCOCH, NEATH, NEATH PORT TALBOT, SA10 7EX

Date of enquiry:	23 March 2017
Date enquiry received:	23 March 2017
Issue date:	23 March 2017
Our reference:	51001400175001
Your reference:	14156

Non-Residential Coal Mining Consultants Report

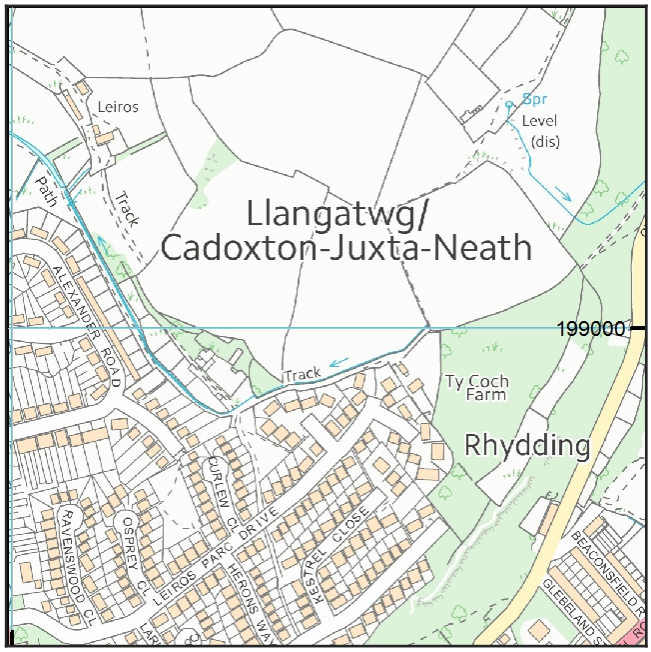
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Terra FIrma (Wales) Ltd

Enquiry address

LEIROS PARK, BRYNCOCH, NEATH, NEATH PORT TALBOT, SA10 7EX



Approximate position of property

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200 Lichfield Lane
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NG18 4RG

www.groundstability.com

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/thecoalauthority
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Detailed findings

Past underground coal mining

Colliery	Seam	Mineral	Panel	Depth (m)	Direction to working	Disposition	Extraction thickness (cm)	Year
unnamed	HUGHES	Coal	4JEL	62	Beneath Property	0.0	110	1900
unnamed	HUGHES	Coal	4KEZ	69	Beneath Property	0.0	145	1901
unnamed	HUGHES	Coal	4JEK	82	Beneath Property	0.0	110	1900
RYDDING	MYNYDDISLWYN LOWER LEAF	Coal	4JM5	137	SW	0.5	200	1882

Probable unrecorded shallow workings

None.

Outcrops

Seam name	Mineral	Thin indicator	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
DARREN DDU	Coal	False	Beneath property	N/A	114

Spine roadways at shallow depth

Yes.

Future underground mining

None recorded.

Licence details (AOR)

None recorded.

Section 46 notices

None recorded.

Geology

Fault under or close to the property recorded.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyance details
Adit	275199-019	275709 199028		Coal	
Shaft	275199-026	275094 199112		Coal	
Shaft	275198-005	275422 198723		Coal	
Shaft	275199-025	275046 199130		Coal	
Shaft	275199-024	275051 199054		Coal	
Shaft	275199-027	275320 199075		Coal	
Adit	275199-002	275527 199225		Coal	
Shaft	275199-007	275545 199275		Coal	
Adit	275198-016	275618 198871		Coal	
Adit	275199-020	275704 199006		Coal	

Court orders

None recorded.

Worked out opencast sites

None recorded.

Coal mining related hazards

None recorded.

Coal mining subsidence

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

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

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

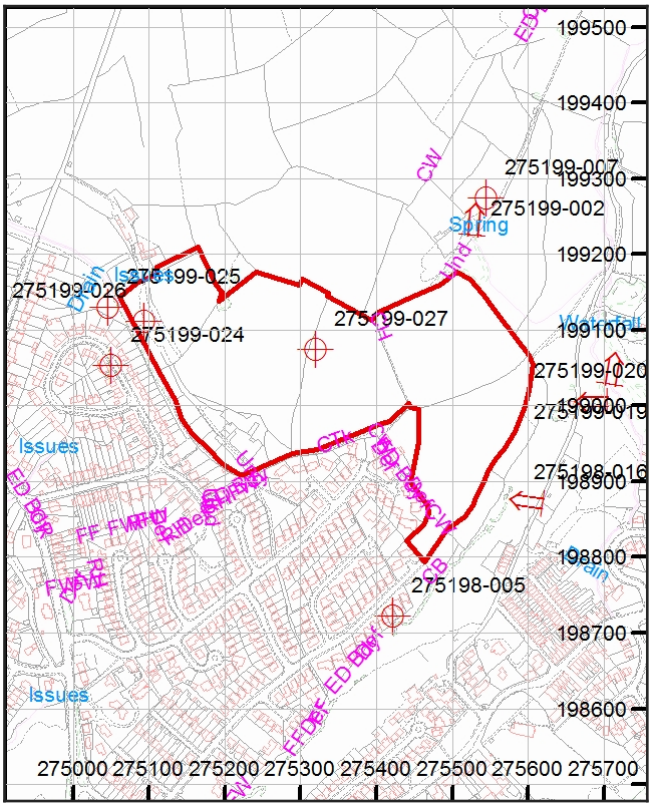
Enquiry boundary

Key

Approximate position of enquiry boundary shown

Disused adit

Disused mineshaft



How to contact us

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/coalauthority

Map data

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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	23 March 2017
Issued to	TERRA FIRMA (WALES) LTD 5 DERYN COURT WHARFEDALE ROAD PENTWYN CARDIFF CARDIFF CF23 7HA
Property search for	LEIROS PARK BRYNCOCH NEATH NEATH PORT TALBOT SA10 7EX
Reference number	51001400175001
Date of issue	23 March 2017
Cost	£100.00
VAT @ 20%	£20.00
Total received	£120.00
VAT registration	598 5850 68

ANNEX B
Rotary Probehole Logs

terrafirma
Tel: 02920 735354
info@terrafirmawales.co.uk
www.terrafirmawales.co.uk
Terra Firma (Wales) Limited
5 Deryn Court, Wharfedale Road
Pentwyn, Cardiff
CF23 7HA

Borehole No.
PH01
Sheet 1 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Brown silty gravelly SAND (driller's description).
				3.90				Grey MUDSTONE with sandstone bands.
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

terrafirma
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Terra Firma (Wales) Limited
5 Deryn Court, Wharfedale Road
Pentwyn, Cardiff
CF23 7HA

Borehole No.
PH01

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description	
									11
									12
									13
									14
									15
				15.20				COAL	
				15.60				Grey MUDSTONE with sandstone bands.	
									16
									17
									18
									19
								Continued on Next Sheet	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH01
Sheet 3 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH02
Sheet 1 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								Brown silty gravelly SAND (driller's description).	
				4.20				Grey MUDSTONE with sandstone bands.	
								Continued on Next Sheet	

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 4m. 3] Probehole backfilled with arisings.

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Borehole No.
PH02

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description
				12.20				Grey SANDSTONE with mudstone bands.
				18.20 18.30				COAL Grey MUDSTONE with sandstone bands.
								Continued on Next Sheet

11 12 13 14 15 16 17 18 19 20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 4m. 3] Probehole backfilled with arisings.

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Borehole No.
PH02
Sheet 3 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 4m. 3] Probehole backfilled with arisings.

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Borehole No.
PH03
Sheet 1 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								Brown silty gravelly SAND (driller's description).	1 2 3 4 5
				5.60				Grey and brown SANDSTONE.	6 7 8 9 10
								Continued on Next Sheet	

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH03

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
				12.60				COAL	13
									14
				14.70				Grey MUDSTONE with sandstone bands.	15
									16
									17
									18
									19
								Continued on Next Sheet	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH03
Sheet 3 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 29/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH04
Sheet 1 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Brown silty gravelly SAND (driller's description).
				3.90				Brown MUDSTONE with sandstone bands.
				5.40				Grey and brown MUDSTONE.
								Continued on Next Sheet

1 2 3 4 5 6 7 8 9 10

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH04

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
				10.20				COAL	11
				11.60				Grey MUDSTONE with sandstone bands.	12 13 14 15 16 17 18 19
								Continued on Next Sheet	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH04
Sheet 3 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH05
Sheet 1 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Brown silty gravelly SAND (driller's description).
				1.80				Grey and brown SANDSTONE with mudstone bands.
				5.20				Grey and brown MUDSTONE.
				6.70				Grey SANDSTONE with mudstone bands.
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH05

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH05
Sheet 3 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH06

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Brown silty gravelly SAND (driller's description).
				1.40				COAL
				1.70				Brown MUDSTONE
				3.10				Grey and brown MUDSTONE with sandstone bands.
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 1m. 3] Probehole backfilled with arisings.

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Borehole No.
PH06
Sheet 2 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
								Continued on Next Sheet	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 1m. 3] Probehole backfilled with arisings.

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Borehole No.
PH06
Sheet 3 of 3

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 31/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 1m. 3] Probehole backfilled with arisings.

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Borehole No.
PH07
Sheet 1 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60				Brown silty gravelly SAND (driller's description).
								Grey and brown SANDSTONE with mudstone bands.
								Continued on Next Sheet

1 2 3 4 5 6 7 8 9 10

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH07

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH07
Sheet 3 of 3

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH08

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description
				0.30				Brown silty gravelly SAND (driller's description).
								Grey and brown SANDSTONE.
				8.70				Grey and brown SANDSTONE with mudstone bands.
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH08

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH08

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH09

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.45				Brown silty gravelly SAND (driller's description).
								Grey and brown SANDSTONE with mudstone bands.
								Continued on Next Sheet

1 2 3 4 5 6 7 8 9 10

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH09

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH09

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 30/08/2017 -	Logged By DP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									21
									22
									23
									24
									25
									26
									27
									28
									29
				30.00				End of Borehole at 30.000m	30

Remarks: 1] Probehole logged from driller's returns. 2] Probehole backfilled with arisings.

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Borehole No.
PH10
Sheet 1 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								CLAY (driller's description).
				1.60				SANDSTONE/MUDSTONE
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH10

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
				16.70				COAL	17
				17.10				SANDSTONE	18
									19
				20.00				End of Borehole at 20.000m	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH11
Sheet 1 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								CLAY (driller's description).
				2.80				Broken SANDSTONE (driller's description).
				3.90				SANDSTONE/MUDSTONE

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH11
Sheet 2 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
				15.60				COAL	
				16.00				SANDSTONE	16
									17
									18
									19
				20.00				End of Borehole at 20.000m	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 3m. 3] Probehole backfilled with arisings.

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Borehole No.
PH12
Sheet 1 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								CLAY (driller's description).	1
				1.80				SANDSTONE/MUDSTONE	2, 3, 4, 5, 6, 7, 8, 9, 10
								Continued on Next Sheet	

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH12

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
									15
									16
									17
									18
									19
				20.00				End of Borehole at 20.000m	20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH13
Sheet 1 of 2

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								CLAY (driller's description).
				1.50				SANDSTONE/MUDSTONE

1 2 3 4 5 6 7 8 9 10

Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH13

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 14/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
									11
									12
									13
									14
				14.30				COAL	15
				15.30				SANDSTONE	16
									17
				17.50				End of Borehole at 17.500m	18
									19
									20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH14
Sheet 1 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description
								CLAY (driller's description).
				4.50				SANDSTONE/MUDSTONE
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 5m. 3] Probehole backfilled with arisings.

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Borehole No.
PH14
Sheet 2 of 2

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description
				11.40				COAL
				12.60				SANDSTONE
				15.00				End of Borehole at 15.000m

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 5m. 3] Probehole backfilled with arisings.

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Borehole No.
PH15
Sheet 1 of 2

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								CLAY (driller's description).
				1.50				SANDSTONE/MUDSTONE
				8.20				COAL
				9.30				SANDSTONE
								Continued on Next Sheet

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH15
Sheet 2 of 2

Project Name:	Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location:	Rhydding, Neath		Level:	Scale 1:50
Client:	Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
				11.50				End of Borehole at 11.500m	11 12 13 14 15 16 17 18 19 20

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 2m. 3] Probehole backfilled with arisings.

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Borehole No.
PH16
Sheet 1 of 1

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								CLAY (driller's description).
				1.20				SANDSTONE
				6.00				COAL
				7.00				SANDSTONE
				9.00				End of Borehole at 9.000m

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 1m. 3] Probehole backfilled with arisings.

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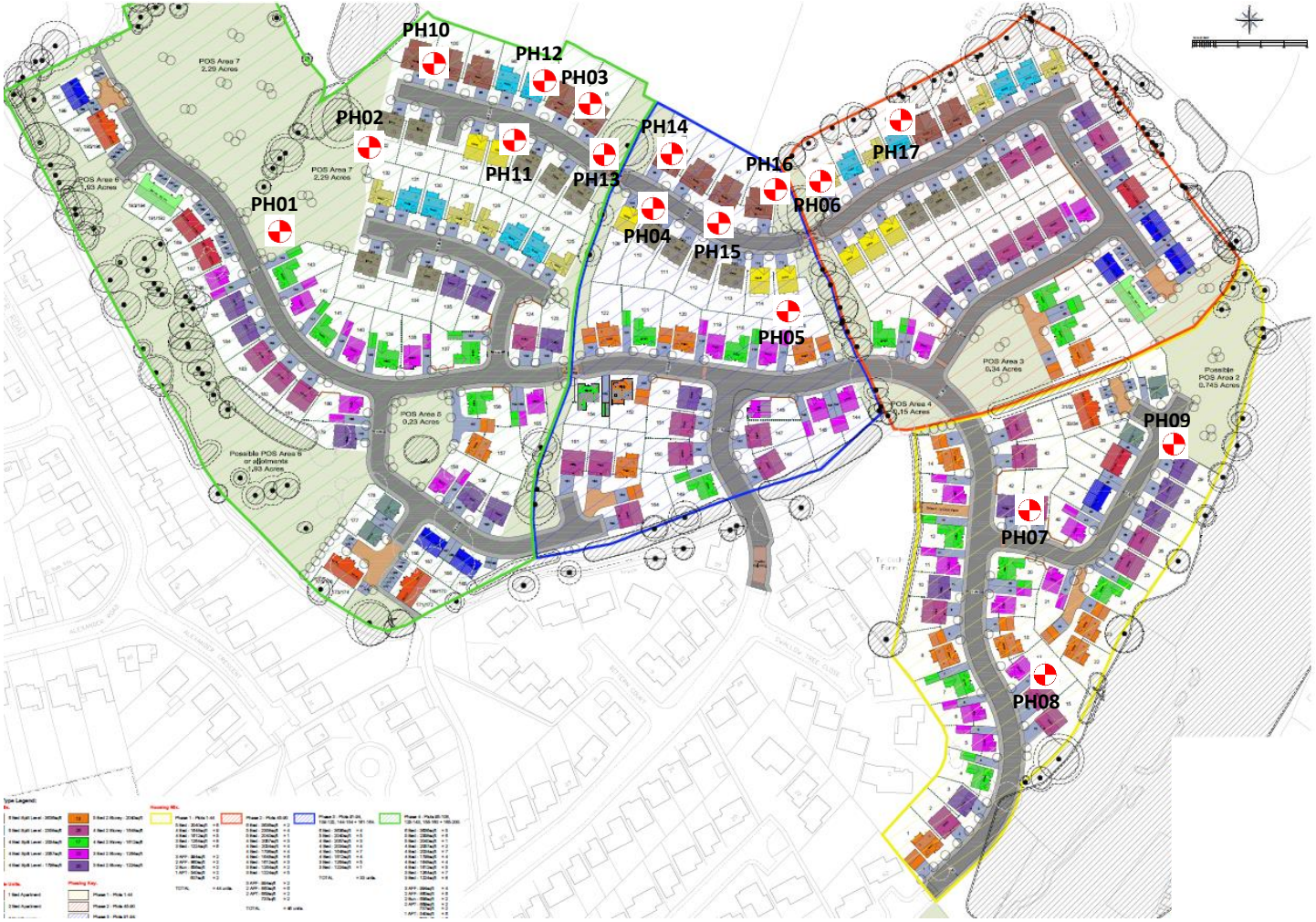
Borehole No.
PH17
Sheet 1 of 1

Project Name: Leiros Park	Project No: 14156	Co-ords:	Hole Type RO
Location: Rhydding, Neath		Level:	Scale 1:50
Client: Hale Construction Limited		Dates: 15/09/2020 -	Logged By CP

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Well	Legend	Stratum Description
								CLAY (driller's description).
				1.00				SANDSTONE
				3.70				COAL
				4.50				SANDSTONE
				6.50				End of Borehole at 6.500m

Remarks: 1] Probehole logged from driller's returns. 2] Casing used to 1m. 3] Probehole backfilled with arisings.

Drawings



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Job Number:

14156-2

Job Title:

Leiros Park, Rhydding, Neath

Drawing Title:

Probehole Layout

Drawing Number:

01

Scale:

Not To Scale

North