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Margam Park Visitors Arrival Centre Proposed Commercial Development Preliminary Coal Mining Risk Assessment

Report Reference: ESP.9852.9660

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Margam Park Visitors Arrival Centre Proposed Commercial Development Preliminary Coal Mining Risk Assessment

Prepared for:
Neath Port Talbot County Borough Council
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Report Reference: **ESP.9852.9660**

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Appendix A Extracts From Historic Mapping

Appendix B Geological and Environmental Data Report

Appendix C Mining Remediation Authority Consultants Report

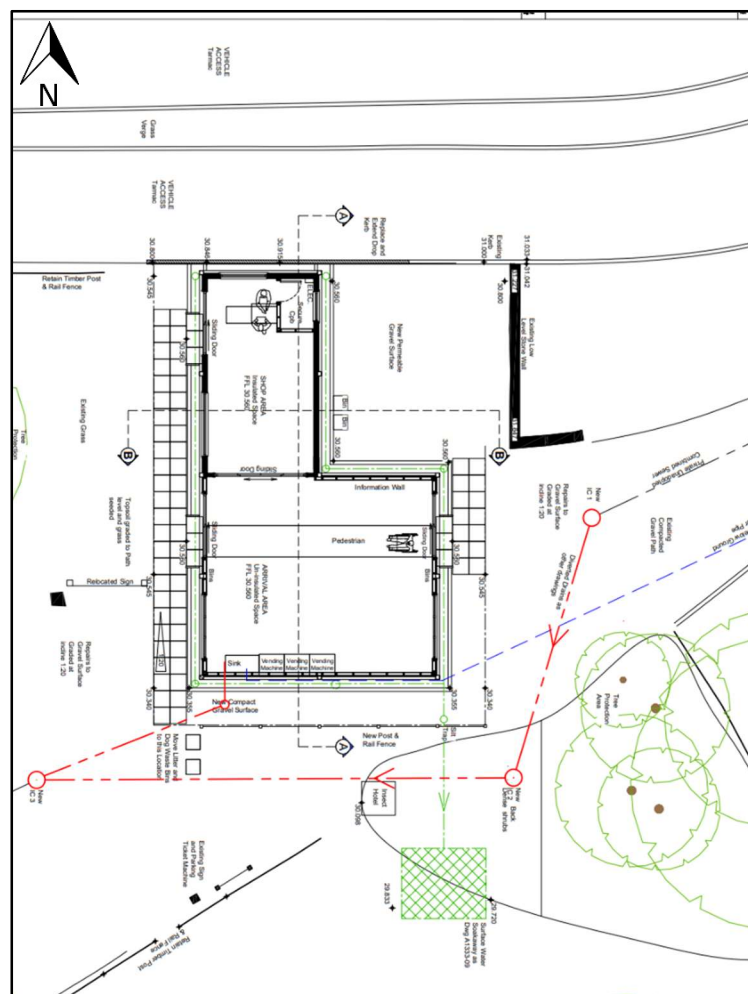
General Notes

1 Introduction

1.1 Background

Neath Port Talbot County Borough Council (hereafter referred to as the Client) is proposing to redevelop the visitor gate lodge at Margam Country Park. The Earth Science Partnership Ltd (ESP), Consulting Engineers, Geologists and Environmental Scientists, was instructed by the Client to prepare a Phase One, desk study-based Coal Mining Risk Assessment (CMRA) to evaluate potential risks posed by past mine workings to the proposed development. The site location is shown on Insert 2 in Section 2.1.

The proposed development will comprise a new single-storey building with an arrival area and shop, with the current building on site to be demolished. A surface water soakaway is also proposed in the south. The proposed layout is presented as Insert 1.



Insert 1 - Proposed Site Layout Plan (provided by the Client – Drawing Ref. A-1333-06). Not to scale.

The Client has been advised by the Neath Port Talbot Planning Officer that:

“The application site lies within a high-risk area in respect of coal mining. As such, a Coal Mining Risk Assessment issued by the Coal Authority, together with a specialist investigation and assessment of risk and remedial measures, must be submitted with this application.”

1.2 Objective and Scope of Works

The scope of works of this preliminary risk assessment is in general accordance with the published Mining Remediation Authority (formerly Coal Authority) guidance on a risk-based approach to development (Coal Authority, 2014). Specifically:

- Obtain and review relevant desk study data on the site relating to past coal mining; and
- Identify and evaluate the risks, individually and cumulatively, to the proposed development based on desk study data at this stage.

The scope of works was mutually developed and agreed with the Client and ESP within an agreed budget and comprised a desk study review of available historical Ordnance Survey maps, geological maps, memoirs, and a Mining Remediation Authority (MRA) mining report obtained for the site by ESP, assessment, and reporting. No intrusive investigation has been undertaken at this stage.

The contract was awarded based on a competitive tender quotation. The terms of reference for the assessment are as laid down in the Earth Science Partnership email proposal of 22nd June 2026 (ref: Margam Park Visitors Arrival Centre - Coal Mining Risk Assessment). This assessment was undertaken in July 2026.

1.3 Report Format

This report includes a summary of the desk study information reviewed (Section 2), followed by a preliminary assessment of the risks from mining features (Section 3). Recommendations for further intrusive investigation are provided in Section 4. This report is issued as a digital version only.

1.4 Limitations of Report

This report represents the findings of an assessment of risks associated with possible past shallow coal mining and mine entries on the site. The brief did not require an assessment of the implications for any other end use, nor of other geotechnical or geo-environmental hazards (e.g., contamination, slope stability and gas risks).

These potential ground hazards may require further assessment prior to development. It should also be appreciated that no intrusive investigation has been completed at this stage. The report is not a comprehensive site characterisation and should not be construed as such.

Where preventative, ameliorative or remediation works are required, professional judgement will be used to make recommendations that satisfy the site-specific requirements in accordance with good practice guidance.

Consultation with regulatory authorities will be required with respect to proposed works as there may be overriding regional or policy requirements which demand additional work to be undertaken. It should be noted that both regulations and their interpretation by statutory authorities are continually changing.

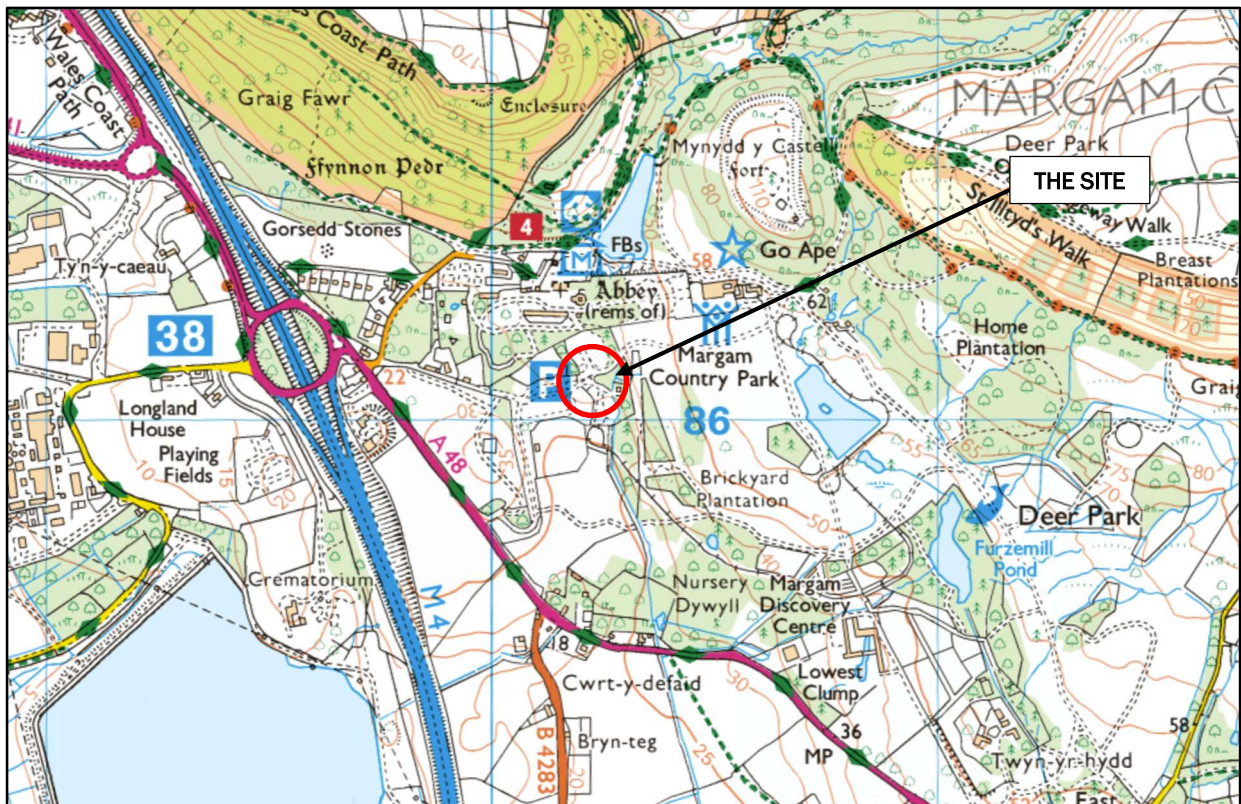
This report represents the findings and opinions of experienced geo-environmental and geotechnical specialists. Earth Science Partnership does not provide legal advice, and the advice of lawyers may also be required.

2 Desk Study Review

The information presented in this section was obtained from desk-based research undertaken including a review of historical maps, Mining Remediation Authority information, a geological and environmental data report, geological maps, and further readily available desk study information.

2.1 Site Location and Description

The site is located within the southwest of Margam Country Park, approximately 3km southeast of Margam, Port Talbot. The National Grid Reference of the centre of the site is (SS) 280172 186075 and the postcode is SA13 2TJ. A Site Location Plan is presented as Insert 2 below.



Insert 2 - Site Location Plan from Ordnance Survey 1:25,000 scale map.
Reproduced with permission (OS License No.: AL100015788).

The site comprises an irregular-shaped parcel of land of around 20m length north to south and 20m width east to west at the longest points, occupying an area of around 0.07ha. It is presently occupied by an existing visitors centre in the east, approximately 15m long by 5m wide, surrounded by soft landscaping and a compacted gravel access path leading towards the building from the west.

It is bounded by:

- To the north: vehicular access road to the Orangery Car Park and soft landscaping including mature trees.
- To the east: soft landscaped grounds and pedestrian access to the park.
- To the south: landscaped grounds including mature trees. Compacted gravel roadways are present to facilitate parking on the grassed areas.

- To the west: the main car park is present to the west with a series of compacted gravel roads with grassed verges between to allow for vehicle parking.

The current site layout is shown in a recent aerial image captured of the site presented as Insert 3.



Insert 1 - Recent aerial photograph of the site. Not to scale. (Red line boundary shown as approximate only)

The general topography of the area slopes to the southwest, and a topographic survey provided by the Client indicates that the site itself slopes from 31.0m AOD in the northeast to 29.6m AOD in the southwest. It should be noted that large areas of the surrounding area have been landscaped at multiple points in the past.

2.2 Site History

2.2.1 Published Historical Maps

The site history with regard to the historic mining legacy has been assessed from a review of available historical Ordnance Survey County Series and National Grid maps. Extracts from the historical maps are presented in Appendix A and the salient features are discussed below.

The earliest mapping from 1885 shows that the site was already part of Margam Country Park, crossed by an access road running west to east along the northern boundary and allowing access into the wider park. This trackway is incorporated into the current access road into the park. No significant changes are recorded on the site until the car park redevelopment in 1990, when a number of new tracks and roadways were constructed to bring the site into its current orientation, with non-coniferous trees and the current building present on site. An engine house was constructed 100m east in 1899, and the building was remodelled into the current public bathrooms in 1993. The cricket ground 50m south was constructed in 1947.

A stream present 80m to the east of the site has remained relatively unchanged since 1885. It is shown as issuing 150m east before flowing west, then turning to the south.

Historical mapping identifies old gravel pits recorded 500m west and some 800m northeast of the site in 1914, and no other significant mining features are identified. The Data Report in Appendix B identifies five surface workings within 250m of the site, three of which relate to the construction of New Pond 123m to the east and one to the graveyard to the north.

The Data Report references the potential for non-coal mining activity 330m north of the site, comprising possible underground mine workings relating to iron ore extraction. No evidence of this is shown on the historical mapping; however, the potential for underground workings should not be discounted.

2.2.2 Other Sources

An internet search (<https://www.margamcountrypark.co.uk/about/historic-margam/>) states that *'Margam Park and Castle sit within 850 acres of historic parkland, with evidence of over 4,000 years of continuous human activity. From prehistoric settlements to Roman occupation, Celtic communities and medieval religion, the site is one of Glamorgan's most significant ancient landscapes.'*

The 12th-century Margam Abbey was once a major religious centre in South Wales, and its impressive remains including the Chapter House still stand today. After the Dissolution, successive owners reshaped the estate, building new houses and creating the classical parkland seen today. The Orangery, built in the late 18th century, remains one of the largest buildings of its kind in Britain.

In the 19th century, the estate was further expanded with the construction of Margam Castle, a Tudor-style mansion. Following decades of decline after the Second World War, the estate was purchased and restored, and opened to the public in 1977.

Today, Margam Park welcomes visitors to explore its landscape, gardens, wildlife and heritage.'

This website suggests that monks hunted deer and mined coal in the year 1200. The historical maps show St Mary's Church and Abbey between 100m and 250m to the north; therefore, it is possible that the monks' coal mining would have been near these features.

The nearby Engine House provided electricity for the estate. It is understood to have been mainly water powered but had a steam-powered back-up generator, which would have required coal as a fuel.

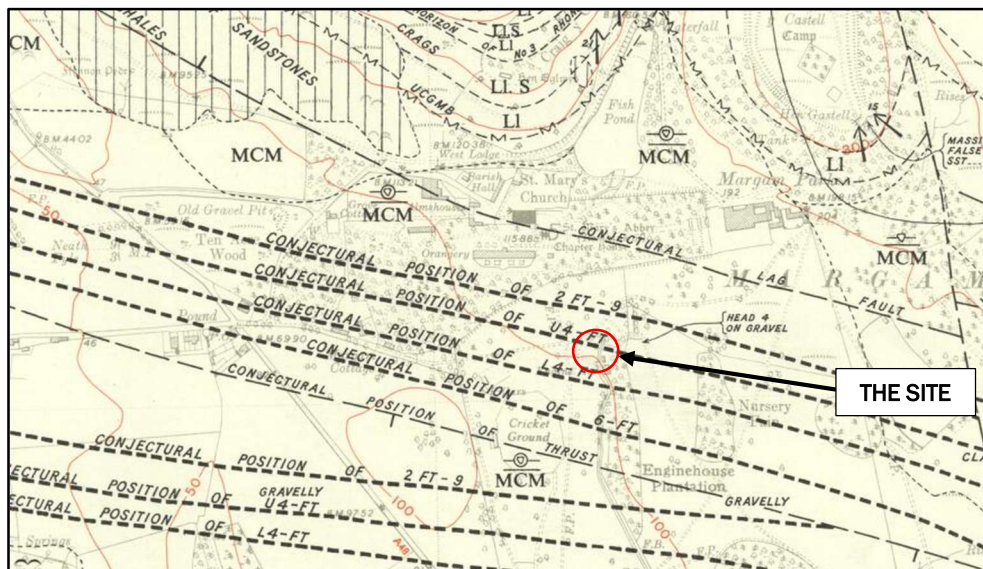
2.3 Previous Investigations and Assessments

We are not aware of any previous investigations or assessments at the site; however, a BGS borehole record is present on site, indicating that a previous assessment was completed in 1984 (Section 2.4.2).

2.4 Geological Setting

2.4.1 Published Geology

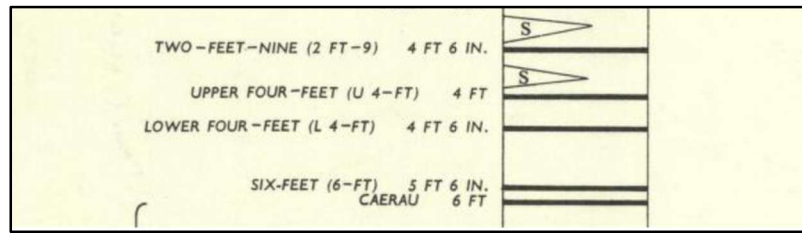
The published 1:10,560 scale geological map for the area of the site (Sheet Glamorgan 33 NE), available on the website of the British Geological Survey, 2026, and presented as Insert 4, indicates the site to be underlain by glacial sand and gravel over undivided Middle Coal Measures. The conjectural position of the Upper Four Feet coal seam is shown crossing the site northwest to southeast. The published geological map sheet identifies thin Head Deposits to the east of the site, recorded at 4 feet (1.2m) in thickness. No Made Ground is shown; however, given the development of the site and extensive landscaping as part of the wider park, it is likely that a thin covering of Made Ground is present.



Insert 4 - Extract from BGS Geological Map Sheet Glamorgan 33 NE, original 1:10,560 scale.
Reproduced with permission (BGS licence number: C15/05 CSL)

Reference to the up-to-date mapping available on the website of the British Geological Survey (BGS, 2026) indicates a similar succession, with superficial Glaciofluvial Deposits of Devensian sand and gravel. Bedrock is indicated to be South Wales Middle Coal Measures Formation of interbedded mudstone, siltstone and sandstone, with coal seams and associated seat earths.

The geological map indicates the conjectural outcrop of a series of coal seams trending northwest to southeast from the Two Feet Nine seam approximately 130m north, the Upper Four Feet crossing through/near the site, the Lower Four Feet outcropping approximately 10 to 20m to the south, and the Six Feet coal seam some 100m south. The coal succession is shown in the map vertical legend extract below.



Insert 2 - Extract from BGS Geological Map Sheet Glamorgan 33 NE, original 1:10,560 scale.

The map indicates the strata to dip to the north between 14° and 21° in the area. There are several faults shown in the area, trending west-east and some north-south.

The vertical section on the BGS mapping shows the thickness of the seams beneath the site. The Two Feet Nine is recorded as 4 feet 6 inches (1.37m), the Upper Four Feet is shown as 4 feet thick (1.21m), the Lower Four Feet is recorded as 4 feet 6 inches (1.37m), and the Six Feet seam is recorded as 5 feet 6 inches (1.67m) thick.

Reference to the supporting BGS memoir states that the Six Feet seam has been worked on a greater scale than any of the seams in the area, with many collieries completely exhausted. The mapped South Crop is obscure, although it appears to consist mainly of a single seam about 6 ft thick; however, local splitting has been observed during opencast operations in the Cefn area, west of Aberkenfig. There is limited information regarding the Four Feet seams, although these are recorded as a compound group of coals subject to complex splitting.

The memoir also records the Two Feet Nine seam to the north of the site, where in the Heol-y-cyw area it has been proved by Opencast exploration to be 4 to 4.5 ft, while, although intensely disturbed, it has also been extensively worked by opencast methods between Aberkenfig and Margam.

Given the mapped location of the Upper Four Feet seam outcrop, it is possible that it underlies the site, if not present at surface, while the Lower Four Feet has the potential to underlie the site at shallow depth. Based on the lowest dip angle of 14° identified in the area, this would place the Lower Four Feet seam at around 3m to 5m bgl in the south, depending on depth to rockhead. The Six Feet coal seam conjecturally outcrops some 100m to the south of the site and, based again on the lowest angle of dip, this seam is likely to be within 25m of the surface beneath the site.

A Conceptual Ground Model is provided in Section 2.6 that uses the information we have to estimate the possible coal mining setting below the site and specifically below the proposed building. It is worth noting that without accurate site data, this model is subject to change as it is reliant on the mapped outcrop positions of the coal seams.

2.4.2 Available BGS Borehole Records

The British Geological Survey website (BGS, 2026) indicates the available records of one borehole on site from the 1984 construction of the Orangery access road. This record (Ref: SS88NW32) is confidential and permission to release the data must be sought from the owners before more detailed information can be obtained. A second record from the same confidential investigation is shown 177m to the southwest.

2.5 Mining Remediation Authority Records

2.5.1 Mining Remediation Authority Website

Reference to the Mining Remediation Authority website (MRA, 2026) provides the following salient information:

- The outcrops of two unnamed coal seams are shown to cross the site in an east-west direction (likely the Upper and Lower Four Feet). Two other coal outcrops are also shown, mirroring the geological map information.
- No past surface hazard or surface mining is identified in the vicinity of the site.
- No recorded or probable past shallow coal mining is indicated in the vicinity of the site.
- No mine entries are shown within the site boundary. Mine entries are shown some 600m to the east.
- The site lies within a 'Development High Risk Area', associated with the coal outcrops.

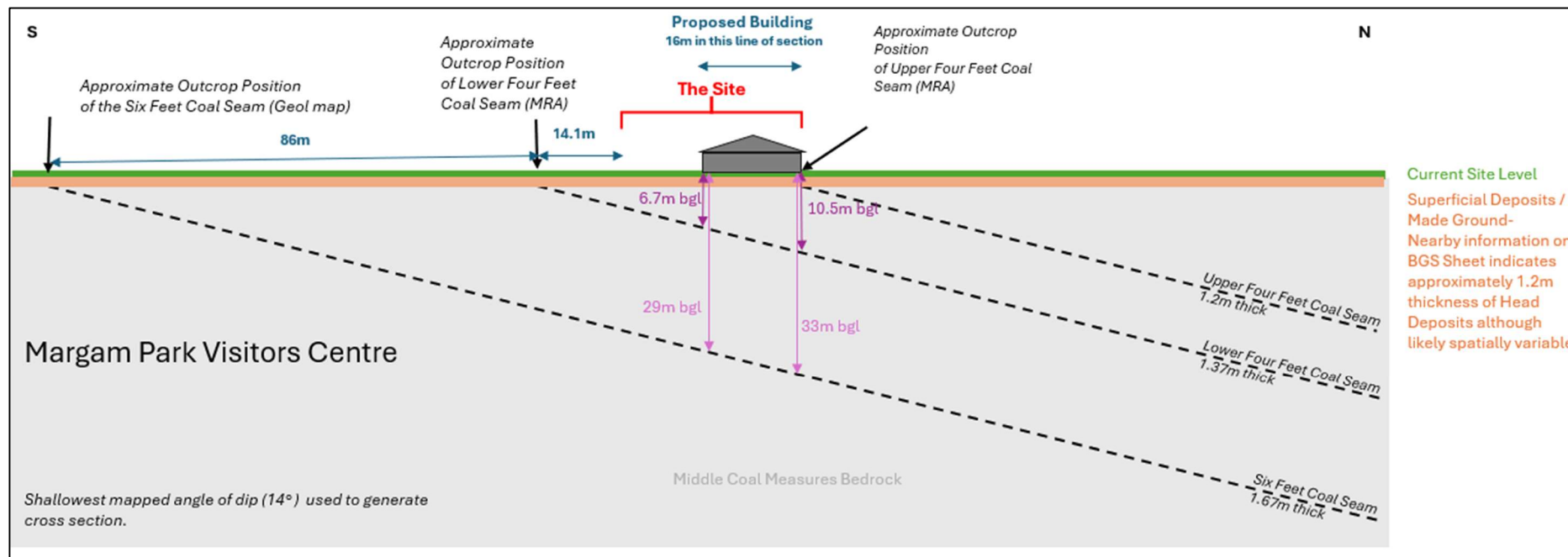
2.5.2 Mining Remediation Authority Report

A consultant's mining report has also been obtained from the Mining Remediation Authority and is presented in Appendix C. This indicates that, based on the available Mining Remediation Authority records:

- There are no recorded past underground mine workings beneath the site.
- There is no record of probable unrecorded shallow workings or spine roadways.
- There are no mine entries recorded within 100m of the site.
- The outcrop of the Lower Four Feet coal seam is listed on site on a 105 degree bearing, and the Upper Four Feet coal seam is shown to be 14.1m south of the site, bearing 102 degrees. Both seams are recorded as being workable.
- There are no recorded geological faults or fissures recorded beneath the site.
- There are no recorded damage notices or claims for the subject property, or any property within 50m of the site boundary, since 31st October 1994.
- There is no record 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.
- No mine gas emission has been recorded within 500m of the property. However, the report states that this does not mean that mine gas is not present within the vicinity. The Mining Remediation Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.
- No future mining or licensing is proposed.
- No notices have been given under Section 46 of the Coal Mining Subsidence Act 1991 stating that the land is at risk of subsidence.
- The site is located in an area of historical coal mining activity.

2.6 Conceptual Ground Model

Based on the information obtained to date, a Conceptual Ground Model of the site is shown below to indicate the potential risks from historic mining.



Insert 6 – Conceptual Ground Model (Not to Scale).

The above is based on desk-based information obtained relating the site and will need to be refined following intrusive works. Geological map data indicates that the dip may be steeper (possibly up to 21°) which would result in any coal seams being present at greater depth across the whole site; however, these dips are recorded within a different fault block and the stratigraphy identified may not represent the succession beneath this study area.

3 Assessment of Coal Mining Risks

3.1 Summary of Mining Hazard

The potential coal mining risks identified at the site are summarised in Table 2 below:

Table 2: Identified Coal Mining Risks

Coal Mining Aspect	Identified Hazard	Risk Assessment
Underground Coal Mining (recorded at shallow depth ¹)	No	None identified.
Underground Coal Mining (unrecorded shallow ¹)	Possible	See Section 3.2
Recorded Mine Entries (shafts and adits)	No	None identified.
Unrecorded Mine Entries (shafts and adits)	Possible	See Section 3.3
Recorded Coal Mining Geology (fissures)	No	None identified.
Unrecorded Past Mine Gas Emissions or Potential	Possible	See Section 3.4
Recorded Surface Mining (opencast workings)	No	None identified.
Notes: 1. The Mining Remediation Authority defines shallow depth as within 30m of the ground surface. 2. Identified risks are discussed further in the following sections.		

3.2 Shallow Coal Mine Workings

Geological and Mining Remediation Authority information identifies the outcrop location of the Upper Four Feet coal seam, 1.21m thick, within the north of the site and the Lower Four Feet coal seam, 1.37m thick, approximately 14m to the south of the site. The conjectural outcrop of the Six Feet coal seam, 1.67m thick, is approximately 100m south of the site, although it is not present in the MRA Consultants Report. These strata dip to the north at a possible minimum dip angle of 14°. This would potentially place all seams beneath the site within approximately 25m of the surface.

At this stage of assessment, it is appropriate to use the well-established industry “rule of thumb”, whereby a subsidence risk is present within ten times the seam thickness. The Lower Four Feet seam may have a subsidence zone in the region of 14m; the Six Feet seam would need approximately 17m of competent bedrock above any workings; and the possibility of the Upper Four Feet being present at, or close to, the surface cannot be discounted and would have a subsidence zone of approximately 12m.

The Two Feet Nine coal seam outcrops to the north of the site and dips towards the north; therefore, it should not present a subsidence risk to the proposed development if its mapped position is accurate.

Coal mining in South Wales dates from at least Roman times; formal requirements to record coal mine plans were only introduced in 1872. Caution must be adopted in assuming that the absence of a record means the absence of mining.

Based on the above, we consider that there is a potential risk of unrecorded shallow coal mine workings at shallow depth beneath the site and investigation works will be required to determine the depth and status of the seams to further assess the potential risks to the development.

3.3 Unrecorded Mine Entries and Bell Pits

Coal mining in South Wales dates from at least Roman times; formal requirements to record coal mine plans were only introduced in 1872. Caution must be adopted in assuming that the absence of a record means the absence of mining.

Margam Abbey monks apparently mined coal on or near Margam Park, we have found no records showing mine entries at the subject site. In any case, it shows that shallow coal was exploited historically; it is reasonable to consider the possible presence of mine entries, bell pits and shallow coal mining in the area. As stated above, no mine entries are shown on the historical maps, geological sheet or MRA information in the vicinity of the site.

Considering the above, we cannot discount that old mine entries, probably dating from before the First Edition of the historical mapping, could be present on site. A site walkover should be carried out.

3.4 Mine Gas Emissions

As discussed in Section 2.5.2, the Coal Authority/Mining Remediation Authority has no record of a mine gas emission requiring action in the vicinity of the site. Notwithstanding this, there is a potential risk from mine gas, and a mine gas risk assessment based on the guidelines published by Wilson et al. (2021) would be required. This will need to be assessed through intrusive investigation works.

3.5 Potential Combustibility

Although outside the brief, the developer should be aware of the potential for a combustibility risk where any coal seam crops out across the site. The MRA report indicates a seam to be outcropping on site, and mitigation measures may be required if proven. Further guidance on the risk of potential combustibility can be provided, if required.

4 Recommended Investigation

No conclusive modern evidence of coal mining, or related subsidence, has been identified. However, coal mining in South Wales dates from at least Roman times and is recorded by the abbey monks. Formal requirements to record coal mine plans were only introduced in 1872. Therefore, caution must be adopted in assuming that the absence of a record means the absence of mining.

Considering the potentially shallow presence of economically viable coal, intrusive investigation will be required to confirm the Conceptual Ground Model and assess mining risks to the proposed development.

In particular, the investigation should, as a minimum:

- Confirm the presence/absence of coal seam(s) at shallow depth.
- Confirm the depth, thickness and condition of any identified coal seams.
- Confirm the absence of any further coal seams within influencing depth of the surface.

We recommend that rotary boreholes are constructed, with the first located as close to the southern boundary as possible to determine the depth of any coal seams where the potential risk is highest. Further boreholes will be required, with their locations dependent on emerging findings. These boreholes should be progressed to assess all coal seams within influencing depth of the site surface. We consider that a minimum of three boreholes would be required to prove the dip and strike of the shallow coal seams.

A mine gas risk assessment based on the guidelines published by Wilson et al. (2021) is required.

A preliminary UXO report and provision of statutory service plans will be required prior to any intrusive works.

5 References

BRITISH GEOLOGICAL SURVEY (BGS). 2026. Website accessed July and August 2026.

BRITISH STANDARDS INSTITUTION (BSI). 2020. Code of Practice for Ground Investigation. BS5930:2015+A1:2020. HMSO, London.

COAL AUTHORITY (CA). 2014. Risk Based Approach to Development Management. Guidance for Developers.

MINING REMEDIATION AUTHORITY. 2026. Website accessed July and August 2026.

WILSON S, HENMAN T, LEE A, and MEREDITH R. 2021. Good Practice for Risk Assessment for Coal Mine Gas Emissions. CL:AIRE.

Woodland, A.W. and Evans, W.B. 1964. The geology of the South Wales Coalfield Part IV: The country around Pontypridd and Maesteg (explanation of one-inch geological sheet 248). Department of Scientific and Industrial Research. Memoirs of the Geological Survey of Great Britain England and Wales.