



NKC Geotech Ltd

engineering geologist specialising in the investigation and treatment of disused mineworkings

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Coal Mining Risk Assessment



Proposed storage unit at Pen-y-cae Scout Hut, LL14 2RL

1st Pen-y-Cae Scout Group
Bryn-y-Barcut
Pen-y-Cae
Wrexham
LL14 2RL

2410
4 March 2024



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Site

A site for a storage unit at Pen-y-Cae Scout Hut, Pen-y-cae, Wrexham.

Risk Assessment by

Neil Catlow B.Sc F.G.S Engineering geologist.

Summary of relevant mining information

Publication CIRIA32 'Construction over Abandoned Mineworkings'

Coal Authority Report 51003409010001 dated 4th March 2024

Ordnance Survey 1:2500 First Edition 1875

Geological Survey 1:10560 plans

Mineplan 14885 Christionydd Collie

Nkc Geotech Ltd investigations with relevance to this site:

2020 Bryn Issa, Pence

2009 Plas Bennion Farm, Pen-y-Cae

1420 Pen-y-Cae CP School

0425 Plas Bennion, Pen-y-Cae

0033 Plas Bennion

9422 Plas Bennion

9101 Pen-y-Cae CP School

8922 Nant Hyfryd, Plas Bennion

8915 Yr Enys, Plas Bennion

Assessment of risk that coal mining poses to the proposed development

Geology

The site lies on Carboniferous Bettisfield Formation rocks that form the Wrexham Coalfield, dipping to the east at 1 in 8. These rocks are predominantly shales and sandstones laid down in a tropical delta environment when Europe lay on the equator as part of the continent of Pangea between 310M and 320M years ago. The Bettisfield Formation strata varies between 230m and 520m in thickness depending on locality and contains seams of coal upto 4.5m in thickness at vertical intervals typically varying from 4.0m to 20.0m. Those coal seams which were of economic importance were given an identity when they were of sufficient quality and thickness to justify extraction by mining. Typical names for local coal seams reflect primarily on quality and thickness, for example Main Coal, Yard Coal and Wall & Bench Coal.

The Coal Authority Report states that the site may be underlain at shallow depth by workings in an unidentified coal seam of workable thickness. The current 1996 Geological Survey edition identifies this coal seam as the Red Coal. In addition a deeper group of closely interbedded coal seams known locally as the Fireclay Series lies 10m below the Red Coal,

Past underground coal mining

Coal mining in Pen-y-Cae is recorded in 1410 in the western part of the area, most probably in the Wall & Bench Coal and the Nant Coal east of Lambpit Street, 500m north-west of the site, when the area was part of the medieval Bersham Waste, ie common land. Industrial mining deeper than the outcrop workings and simple bell pits of the 'cole farms' in the Waste dates from the 16th century. My previous investigations in Plas Bennion have shown that there is upto 12m thick boulder clay cover to rockhead which would have precluded very early surface mining but exploratory boring would certainly have been possible after the 16th century and revealed the presence of shallow coal and deeper seams.



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There are only royalty plans of past mining activity under the site of workings abandoned in 1868, pre-dating the 1887 Coal Mine Regulations which required colliery owners to keep and preserve accurate plans of their workings. The coal seams deeper than the Main Coal were principally worked in the 19th century to supply the New British Iron Company furnaces at Acrefair, and horse drawn tramways connected the collieries. One such tramway terminates at a pair of mineshafts of Christionydd Colliery within the site but 80m south-west of the proposed storage unit.

The deepest worked coal seam is the Wall & Bench Coal at 143m below the site, but there are four shallower coal seams known to have been mined here. The coal seams between the Red Coal and the Wall & Bench Coal are, in descending order, the Fireclay Series of coals (closely interbedded Stone Coal, Firedamp Coal and Half Yard Coal seams), the Nant Coal and the Yard Coal. The shallowest mined seam for which there are records is the Yard Coal, 1.0m thick. There are no records of any mining shallower than the Wall & Bench Coal.

Present underground coal workings

There is no current coal mining within 20km of the site.

Future underground coal workings

There are no current coal mining proposals within 20km of the site.

Recorded mine entries on or within 20m of the site boundary

There are two recorded mine entries within the site boundary. These entries are the former Christionydd Colliery shafts 328345-116 and -117, located 80m south-west of the proposed development and sunk to the Wall & Bench Coal at 140m.

Coal mining geology

The Coal Authority have no records of any damage caused by geological faults.

Past opencast mining

There are no former opencast coal mining sites within 200m of the site.

Present opencast mining

There are no current opencast coal mining sites within 200m of the site.

Future opencast mining

There are no proposed opencast coal mining sites within 800m of the site.

Mine gas emissions

There are no recorded mine gas emissions within the site boundary.

Surface hazards

There are no recorded remedial works being carried out by the Coal Authority on the site nor any subsidence claims.



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Further information

My investigation work on sites in Pen-y-Cae encountered unrecorded shallow mineworkings in both the Red Coal and the Fireclay Series of thin seams. The nearest site with Red Coal workings was at Pen-y-Cae CP School, 50m East of the site, in 1991 and here the shallow workings under proposed classroom extensions were stabilised by grouting.

The risk to any proposed development here is subsidence caused by the collapse of shallow mining tunnels upto 1.5m high where the coal seams lie at depths shallower than 20m.

It will be necessary to drill 3 rotary boreholes to 30m to determine the extent of any past mining activity here in the Red Coal or the Fireclay Series coals, and a Coal Authority Permit will be required before any intrusive investigation work can be carried out.

The necessity to stabilise any mineworkings by grouting will depend on the ground conditions proved by the drilling investigation, in particular the thickness of solid rock overlying any workings.

For Nkc Geotech Ltd



Neil Catlow, B.Sc, F.G.S



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Geological plan of the locality
Scale 1:2000 @ A4

