



**nkc Geotech Ltd**

engineering geologist specialising in the investigation and treatment of disused mineworkings

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# Coal Mining Risk Assessment

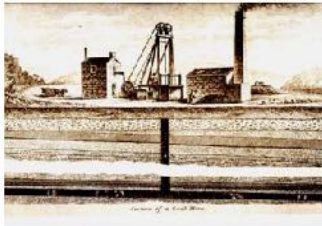


**Rear of Westerdale, Gardden Road, Rhos**

Blueprint Architectural Services  
Office 3K4  
Redwither Business Tower  
Wrexham  
LL13 9XT

**1944**

10 November 2019



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## **Site**

A site for the residential development of 6 semi-detached dwellings at the rear of Westerdale, Gardden Road, Rhos.

## **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 51002194181001 dated 10th November 2019  
Ordnance Survey 1:2500 First Edition 1875  
Geological Survey 1:10560 plans  
Brandie Colliery mineplan

## **Nkc Geotech Ltd investigations with relevance to this site:**

1512 Plas y Wern playing fields, Rhos

## **Assessment of risk that coal mining poses to the proposed development**

### **Geology**

The site lies on Carboniferous Westphalian 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. Westphalian strata 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 deepest worked coal seam is the Wall & Bench Coal at 116m below the site, but there are four shallower coal seams known to have been mined here. The shallowest seam is the Main Coal, 2.5m thick. The Coal Authority indicate that this seam will be present at a possible depth of 23m below the site. The next deepest coal seam is 6m below the Main Coal and locally known as the Brassey Coal, I have encountered extensive workings in both the Main and the Brassey Coals in Rhos and Ponciau.

### **Past underground coal mining**

Coal mining in Rhos is recorded in 1410, most probably in the Main Coal at the Delph immediately east of High Street, 400m 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. The last legal coal mining in Rhos was at Coppi Brickworks where the Llwyneinion Half Yard Coal was mined in conjunction with the underlying fireclay in 1971. The Wall & Bench Coal was also mined illegally by robbing historic old workings and sold locally during the miners' strike of 1985 from outcrops on Llwyneinion Road.

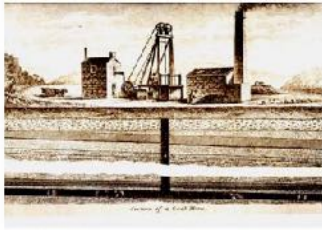
There are only plans with few details of past mining activity under the site of workings which pre-date the 1887 Coal Mine Regulations which required colliery owners to keep and preserve plans of their workings. The coal seams deeper than the Brassey Coal were principally worked in the 19th century to supply Ponciau Furnace at Gutter Hill, and horse drawn tramways connected the collieries.

### **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.



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

There is one recorded mine entry on or within 20m of the site. This is Shaft 329346-386, an un-named shaft of the Brandie Colliery. Whilst the only Brandie mineplan showing the shaft is not available for inspection, the shaft is also shown on the 1875 Ordnance Survey as open and located on a mound of colliery spoil. The shaft depth will be at least 30m to the Main Coal or possibly deeper to the Yard Coal at 90m.

#### **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.

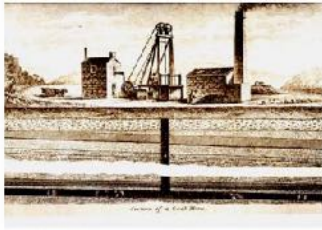
#### **Surface hazards**

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

#### **Further information**

The risk to any proposed development is subsidence caused by the collapse of shallow mining tunnels where there is less than 25m of rock cover to underground workings in the Main Coal. As the Main Coal is known to have been extensively mined in the past, with the deeper Brassey Coal only 6m below the Main, there is a risk of potential instability due to past shallow coal mining activity. An intrusive investigation by the rotary drilling of at least 6 holes to 30m depth will be required to determine the extent of any hazards.

The precise location of Shaft 329346-386 will have to be proved on the site by excavation with a 13 tonne tracked excavator under the supervision of an experienced mining engineer and the ground conditions established so that a remedial scheme can be designed.



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### **Mitigation measures**

If the Main Coal is proved to be under 25m deep, the site will require remedial works by drilling and grouting the old workings under the bearing areas of the proposed buildings to prevent collapse.

There is historical evidence that Shaft 329346-386 will be present on the site and will require remedial works. A typical shaft capping would be 6m square and 500mm thick placed on natural ground. The shaft must be drilled to full depth to prove the integrity of the shaft filling and grouted if the capping cannot be placed at rockhead.

A Coal Authority Permit will be required for the intrusive investigation drilling and the mineshaft search. Further specific Coal Authority Permits required for the remedial stabilisation works which would be necessary.

**For Nkc Geotech Ltd**

A handwritten signature in black ink, appearing to read 'Neil Catlow'.

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



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**Geological plan of the locality**  
**Scale 1:1000 @ A4**

