

Technical Note



Ref. ST20879-0001

CLIENT:	TATA Steel UK
PROJECT:	Project EAF
SUBJECT:	Coal Mining Risk Assessment
JOB NO.:	ST20879
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Introduction

The British Geological Survey (BGS) data indicates that the land beneath the Port Talbot Steel Works site is located on Coal Measures geological formation. A part of the site proposed for redevelopment is described by the Coal Authority (statutory planning consultee for land containing coal) as being a Development High Risk Area. This designation highlights a potential for ground instability, resulting from legacy coal mining operations. A Coal Mining Risk Assessment (CMRA) is a requirement for any planning consultation with such a designation. The CMRA will provide a deeper understanding of the below ground hazards and to allow any proposed redevelopment of the site to be designed in such a way to mitigate against any risk that might be identified.

Coal Measures Summary

The site is underlain by Carboniferous age, Lower and Middle Coal Measures deposits, which range in age from approximately 300 to 360 million years old. These deposits consist primarily of mudstones, siltstones and sandstones, interspersed with bands of coal dipping in a north - east direction. The thickest and most valuable of these coal seams have been given names to help reference and map their mineral value. There are as many as 15 named coal seams which are indicated to subcrop (outcrop beneath soil deposits) within the planning boundary. These named seams are likely to be of mineable thickness, and at least four of these seams are known to have been mined beneath the site. Additional unnamed coal seams are thought to be present but are unlikely to be of sufficient thickness or mineral value to have been mined.

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Several geological faults subdivide the stratigraphy at the site. The Kenfig-Tytalwyn Thrust Fault crosses through the site in an approximate east-west direction and offsets (throws) the geological sequence. The offset is such that several named coal seams are thought to subcrop within the site on both sides of the fault. BGS records also describe additional faulting (Giant's Grave fault and Morfa fault) at the site; but without detailed investigation, the conjectured position, and throw of these faults cannot be accurately determined.

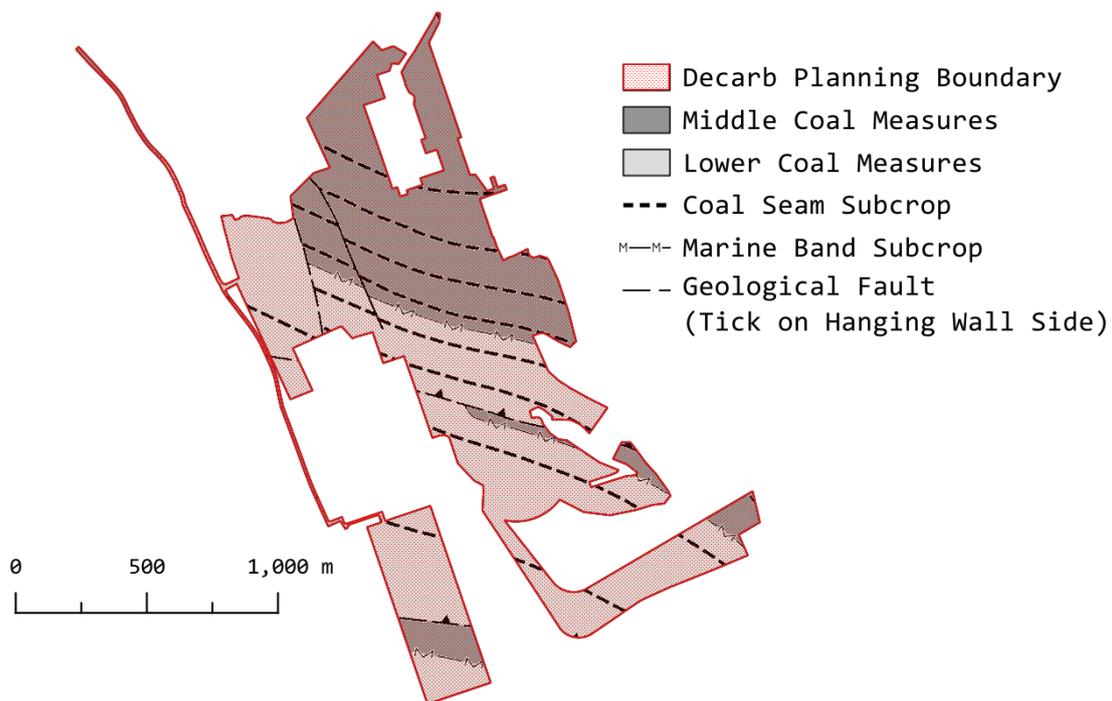


Figure 1 Geological structure within Planning Boundary. Contains British Geological Survey materials © UKRI 2024

Coal mining is known to have historically occurred at the site, most notably associated with the former Morfa Colliery, formerly located at the site. Wardell Armstrong has previously carried out a CMRA on part of the site, identifying only a low to moderate risk to any future development.

Three mine entries are recorded by the Coal Authority within the provided Planning Boundary. Wardell Armstrong has previously carried out physical searches for the three mine entries, physically proving the position of one shaft and providing search records for the other two.

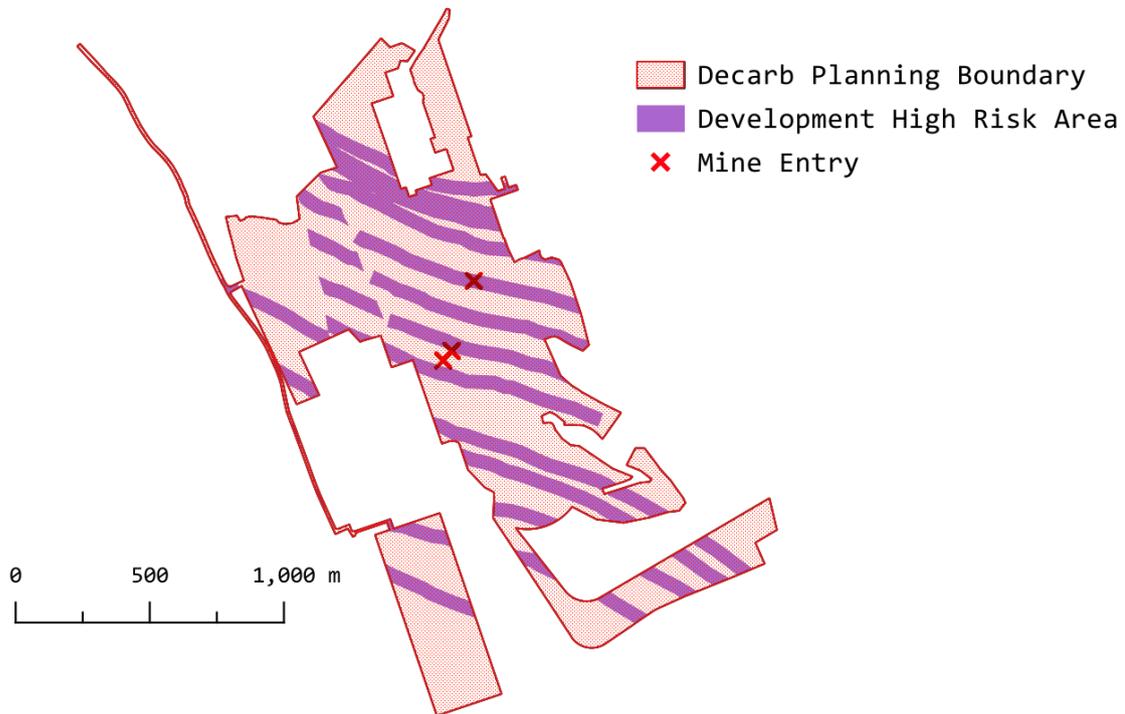


Figure 2 Development High Risk Areas to be revised following CMRA and ground investigation. Coal Authority information © The Coal Authority, 2023

Evidence of possible coal mine workings exists for up to eight of the coal seams beneath the site, and is summarised by each source of the information below:

1. The Coal Authority Consultant Mining Report records workings in the Five Foot, Gellideg, Lower Nine Foot Top Leaf and Garw Vein coal seams.
2. Available Morfa Colliery abandoned mine plans describe workings in the Four Feet (L 4 FT) and Nine Feet (U 9 FT and/or L 9 FT).
3. The North of England Institute of Mining and Mechanical Engineers - Forster Collection, records workings in the Nine Feet (U 9 FT and/or L 9 FT) and Garw Vein.
4. The Northern Mining Research Society website reports the “Morfa colliery worked the North Fawr, South Fawr, Six-Foot, Three-Foot, Nine-Foot, Five-Quarter and Cribbwr seams; and worked the Clay seam between 1854 and 1865”.

Several of the seam names can be corroborated between sources, with evidence for the Nine Feet and Gawr Vein seams reported as worked in three of the above searches. The most recent date of recorded mine workings at the site is 1913, in the Gawr Vein seam, from the

Coal Authority Consultant Mining Report. The likelihood of subsidence or significant ground collapse resulting from recorded mine workings of this age and at the depths is very low. The possibility for historical unrecorded workings at a shallower depth cannot be discounted. Further understanding of the location of any workings, and the depth, age and mineable thickness of each of the coal seam contributions to site risk will be determined by the Coal Mining Risk Assessment.

Coal Mining Risk Assessment

The CMRA as a planning document is divided into sections to reflect each hazard and typically presented in a tabular format with risks, potential consequences and mitigations measures discussed. The specific hazards considered are as follows:

- Past recorded underground mining;
- Past unrecorded underground mining;
- Present and future surface mining;
- Present and future underground mining;
- Mine entries;
- Mine gases; and,
- Geological features – Faults, fissures and breaklines.

Risk Assessment Conclusions

Based on available data, there are coal mining related hazards at the Project EAF development site. A series of coal seams from the Lower and Middle Coal Measures; geological faulting of the Coal Measures; recorded mine workings within several coal seams; and three mine entries are the identified hazards within the site. The current proposed layout for the site redevelopment is understood to have taken into consideration the position of the known mine entries and any sensitive plant and built structures have been kept away from these positions. While scale of the risk has yet to be fully determined, the outline understanding is that the risks to any proposed development are low to moderate. None of the risks identified thus far are considered unsurmountable by design or remediation techniques, in line with the recommendations of the Coal Authority, and industry standard guidance (CIRIA C758 – Abandoned Mine Workings Manual). Pending detailed review of the background information, the CMRA will likely recommend that a phase of ground investigation be carried out to help further quantify the risks.