

# Navigation Colliery Infrastructure Study

## Summary Report

Crumlin, Caerphilly, Wales, U.K.

This summary provides a condensed overview of key findings and proposals from the comprehensive Infrastructure Study for the Crumlin Navigation Colliery site, prepared by Arcadis. The Study focuses on evaluating service provision, exploring renewable energy opportunities, and access road & parking options to support the site's future development and sustainable transformation.

### History and Constraints

The Crumlin Navigation Colliery site, a former coal mine active from 1911 to 1967, features Grade II and Grade II\* listed buildings of exceptional quality, built to facilitate extraction of the region's high value 'steam coal' seam.

Divided into two levels by a ~12m-high revetment wall, the site is accessed via a lane off the B4251, with the River Ebbw running through it in a culvert. Though years of disuse have left the infrastructure in poor condition, the site offers distinct challenges and opportunities for sustainable redevelopment.

### Key Findings by Arcadis

Arcadis assessed the site's infrastructure, including water supply, sewerage, electricity, and telecommunications, proposing improvements where possible. These upgrades are essential to support the wider redevelopment of the site, ensuring it can meet modern utility demands and accommodate future development.

### Water Supply:

The site connects to a mains water supply in the south, with private pipes running through the site; the full extent and location of these private pipes remain unknown and require further survey. While these systems are adequate for current and short-term development needs, they will require reinforcement to meet the demands of full site development.

### Surface Water and Sewage

Surface water is planned to flow through pipes and chambers into sustainable drainage systems (SuDS) such as permeable car park paving and rain gardens, treating water and controlling flows before discharging into the River Ebbw.

A new on-site sewer network will handle foul water, potentially integrating the existing network and connections pending further survey. Full development is expected to require an enhanced mains connection and the installation of a pumping station.

### Client

Caerphilly County Borough Council (CCBC)

### CCBC Representative

Bethan Smith

### Site Representative

Robin Shaw- Friends of the Navigation (Advisory Role to Client)

### Key Arcadis Staff

Louis Brown  
David Hughes  
Arcadis UK- Cardiff

### Products & Services

Infrastructure Study  
Outline Drainage Strategy  
Outline Road and Car Park Design

### Project dates

Begin: September 2024  
End: March 2025

### Electricity:

The site currently connects to the grid via a transformer near the Bath House. Arcadis proposes expanding this network into a ring main to serve all buildings, EV charging points, and proposed pumping station.

### Telecommunications:

BT Openreach ducts and chambers are present across the site, providing potential for straightforward new telecommunication connections pending further survey.

### Culvert Condition

A 2010 inspection of the River Ebbw culvert by Hyder Consulting (now part of Arcadis) found the structure in poor condition, with defects in brickwork, girders, and collapsed sections. In 2020, a section of the culvert collapsed following severe storms.

The culvert is now proposed to be uncovered for most of its length, creating an open channel to enhance biodiversity and amenity whilst reducing collapse risks. The site's main north-south internal road runs directly over the culvert.

### Existing Site Roads

The existing access road from the south of the site is proposed to be widened to two lanes throughout, potentially requiring cutting into the adjacent rock face depending on the Hydro's development. Within the site, access lanes to the upper level and Bath House are proposed to be re-paved. The north-south road running through the site will be removed as part of the culvert works, requiring alternative solutions for connectivity across the site.

### Proposed Car Park and Connectivity

A site car park has been proposed to accommodate staff and visitors, including accessible spaces and EV charging points to align with future mobility needs. The car park design integrates with third-party plans to develop Crumlin Railway Station on the Ebbw Valley Railway, which runs parallel to the site to the east. Additionally, the access road running through the car park will provide north-south connectivity across the site, replacing the road removed as part of the culvert works.

### Strategic Location

Enhancing access roads to and within the site, along with adequate parking provision, will help to fully leverage its strategic location. Crumlin's mid-valley location historically made it a key transport node, today it has excellent connectivity to major road links, including the A467 and A472, providing easy access to the M4, Cardiff and Newport to the south and the Heads of the Valleys Road to the north.

Provision of the proposed Crumlin Station on the site would provide a truly integrated transport hub, further enhancing connectivity in the region.



*View north on site's upper level, with mine caps, workshop and north winding house in view*

## Renewable Energy Opportunities

### Mine Water Re-heating

The study identified the potential to repurpose naturally heated mine water as a renewable energy source for district heating networks. Initial average water temperatures were recorded at ~15.25°C; following remediation works by Hydrock in 2015, whereby the heated mine water flow was separated from emerging groundwater, revised findings by the Friends of the Navigation show this temperature could be ~19°C.

This resource therefore offers a consistent and environmentally friendly heating solution. The existing boreholes and artesian pressure reduce infrastructure costs, making this a viable option to showcase innovative, low-carbon energy use while repurposing the site's mining legacy. The development could serve as a model for mine water re-heating, which is largely under-used resource across the UK's Coal Fields.

### Hydro-Electric Power

Past studies by others show that The River Ebbw offers opportunities for hydro-electric power generation (Hydro), providing a clean and reliable source of renewable energy. Future study is required to determine the compatibility and financial viability of the Hydro proposal with the ongoing development of the site.

### Conclusion

The study outlines proposals for essential infrastructure at the Crumlin Navigation Colliery site, including water, sewerage, electricity, and telecommunications. It also explores sustainable energy opportunities and improved site connectivity, facilitating future development.

These proposals will aid CCBC and stakeholders in transforming the site into a functional and sustainable space, while preserving its historical significance. With appropriate investment, the site could become a model for environmentally conscious development and a catalyst for local economic regeneration.

For further information or updates, please contact Caerphilly County Borough Council or contact the Friends of the Navigation via their website to organise a visit to the site.