

Mine Tailings Capping and Drainage

Pozidrain SKL and Erosaweb, Carrshield Mine Works, UK



CASE STUDY

Project Description

The former Barneycraig lead mine at Carrshield is located within the North Pennines Area of Outstanding Natural Beauty, which itself is a UNESCO Global Geopark. The mine operated primarily between c.1760-1920, and the mine tailings were deposited along the east bank of the River West Allen during that time. As a result, the river was the joint second worst in the Northumbria River Basin Management Plan in respect of mine water pollution, contributing around 20% of the total quantities of lead, zinc and cadmium found in the Tyne Estuary, over 40km downstream of the site. The site was prioritised for remedial action as part of Defra's Water and Abandoned Metal Mines programme, in partnership with the Coal Authority and the Environment Agency.

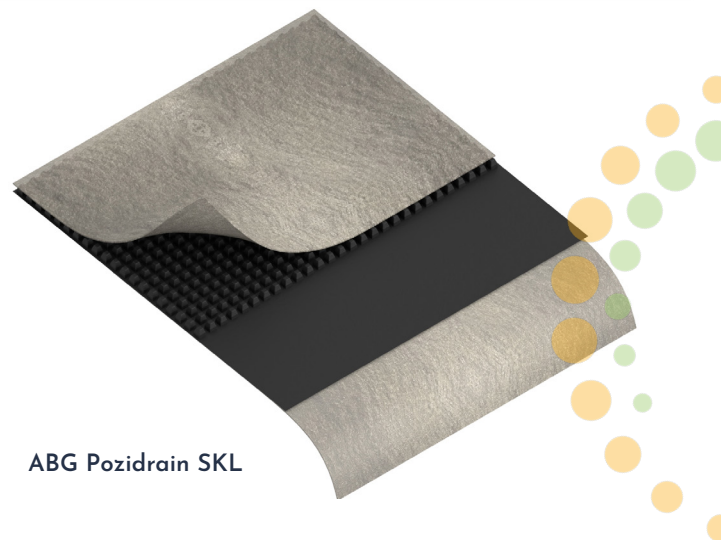
The Challenge

As part of the action plan for the site, the tailings storage facility required a permanent capping solution to prevent rainwater infiltration into the tailings, thus achieving the two key objectives for this part of the works, which were;

- To afford long term stability to the tailings dam, which had already begun to collapse into the River West Allen in several places
- To mitigate the creation, and subsequent ingress, of an estimated 3,500kg of leached lead, zinc and cadmium into the river each year.

Project Information

Client	Defra, The Environment Agency & The Coal Authority
Contractor	J N Bentley
Product	Pozidrain 4SKL & Erosaweb GWX100/300
Quantity	7,000m ² & 2,100m ²
Benefits	<ul style="list-style-type: none">• All-in-one drainage & capping system• High flow capacity in both directions• Integral overlaps for ease of install without specialist installation tools• Large roll widths for rapid installation• Material cost savings• 120 years design life for long term assurance



ABG Pozidrain SKL

ABG LTD

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The Solution

The original capping solution for this site included a separate flexible membrane liner (FML) and a geocomposite drainage layer (GDL). ABG simplified this by proposing Pozidrain 4SKL, which provides both functions in a rapidly installed single layer without compromising the integrity of the containment. Pozidrain requires no specialist contractors or equipment to install. By using Pozidrain 4SKL, the contractor saved significant material costs compared to purchasing separate FML and GDL layers, as well as reducing the programme time for the installation works, whilst still fulfilling the key objectives of the project. Erosaweb GWX was used on the 1:2.5 slopes to reinforce the soil veneer, and a fixing solution was used that secured the Erosaweb without puncturing the new cap.

The ABG Service

ABG provided design assistance, including slope stability and flow capacity calculations.



Wide width rolls enabled rapid installation and minimised the number of joints



Erosaweb panels providing soil veneer reinforcement



Flat selvedge for rapid overlapping and jointing

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