

Saltburn Gill Mine Water Treatment Scheme

Location Map



Easting: 467400
Northing: 519800



Scheme Information

Build Cost	£2,000,000
Main water body protected	Saltburn Gill
Scheme Type	Pumped Passive
Average Flow/Abstraction	60 l/s
Metal Contaminants Removed	Iron

From its beginnings in the mid-19th century, the area of East Cleveland in England has seen large-scale deep mining for over a hundred years. When local ironstone mining operations ceased in the 1960s, the dewatering pumps were turned off and removed. The workings subsequently flooded, and iron-laden mine water rebounded, eventually reaching the ground surface. A severe mine water outbreak occurred on 18 May 1999 in Saltburn Gill, a narrow wooded stream valley. The mine water quickly turned this otherwise high-quality watercourse bright orange, devastating the downstream ecology (photo 1). Mine water continued to discharge into Saltburn Gill and affected several other water bodies, including Skeleton Beck (photo 2), a groundwater body and discharging out to the North Sea (photo 3), occasionally forming a large ochre plume.

A campaign was set up by local residents to remediate Saltburn Gill. After receiving powers in the Energy Act 2011 and funding from the Department of Environment Food and Rural Affairs (DEFRA), the Coal Authority implemented a mine water treatment scheme in the area, employing J N Bentleys as main contractor. The scheme intercepts the mine water and removes the iron contamination prior to discharging clean water into the Saltburn Gill.



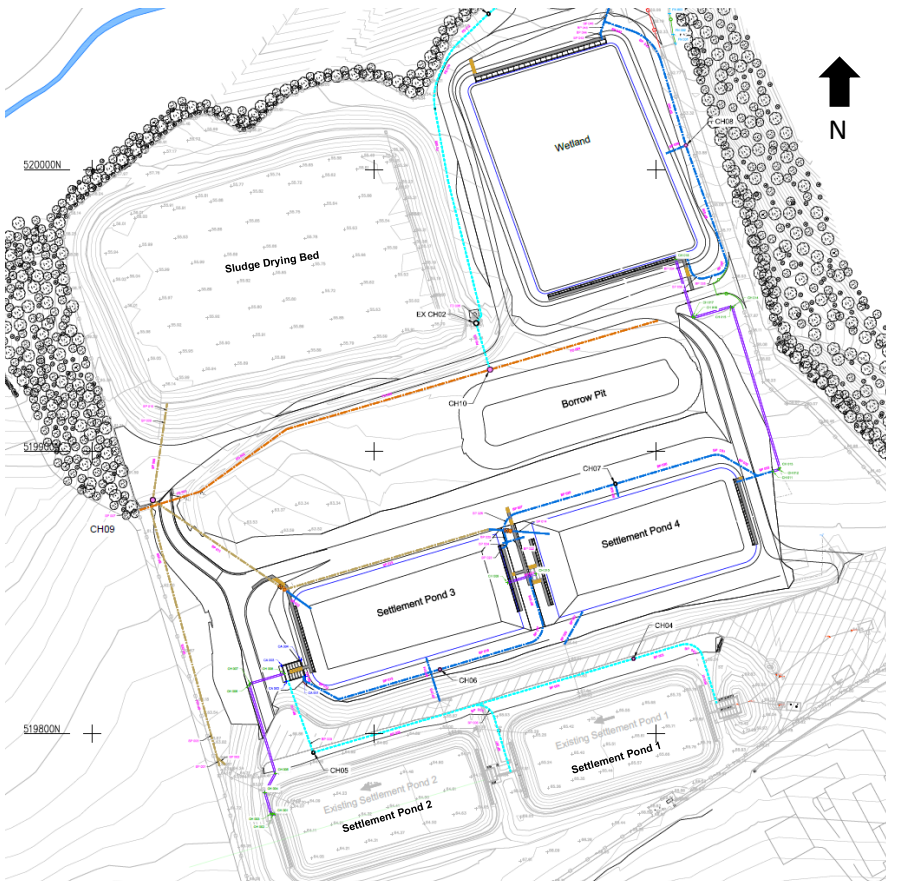
Contacts

The Coal Authority

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Scheme Schematic



Saltburn Gill mine water treatment scheme (under construction)



Phase 1 – two cascades

Phase 1 – two lagoons



Phase 1 – sludge drying bed

Phase 2 – reedbed construction

The Coal Authority has two main construction phases in place for implementing the mine water treatment scheme at Saltburn Gill

Phase 1 is complete and currently operational. It involved the construction of two lagoons with cascades, and a drying bed for ochre sludge. Mine water is pumped to the top of the aeration cascades, where it flows down into the respective lagoons. Here, over a period of 1-2 days, the majority of the dissolved iron precipitates and settles to the bottom. The ochre sludge is collected from the bottom of the lagoons and placed into the drying bed, where the ochre sludge is dried before removal. Monitoring results indicated the Phase 1 infrastructures have efficiently reduced the iron concentration between the raw mine water and the treated discharge by approximately 94%. The results obtained from Phase 1 have provided information on the infrastructure required for Phase 2.

Phase 2 is currently under construction. It involves the construction of two more lagoons, and a polishing reedbed. The reedbed will act to filter iron out of the water to an even lower level, where it will be discharged into the Saltburn Gill stream.

Stakeholders

- The Saltburn Gill Action Group (SGAG) was established by the local community to raise the profile of the problem.
- SGAG successfully managed to bring the debate to parliament, and achieve funding to undertake a scoping and feasibility study.
- Following this, both the **Environment Agency** and the **Coal Authority** became directly involved, and (DEFRA) became involved.
- The Coal Authority's Benefits Assessment deduced that the total monetary benefit from stopping the discharge and treating the mine water was £10.5 million over 25 years.



Photographs of the Skeleton Beck - Before the mine water treatment scheme implementation (left) and after (right)