

Ion Exchange Experience

John F Hunt Water Technology has a proven track record of managing complex groundwater treatment and dewatering projects for our clients, including critical solutions for HS2 and the Mining Remediation Authority (formerly The Coal Authority).

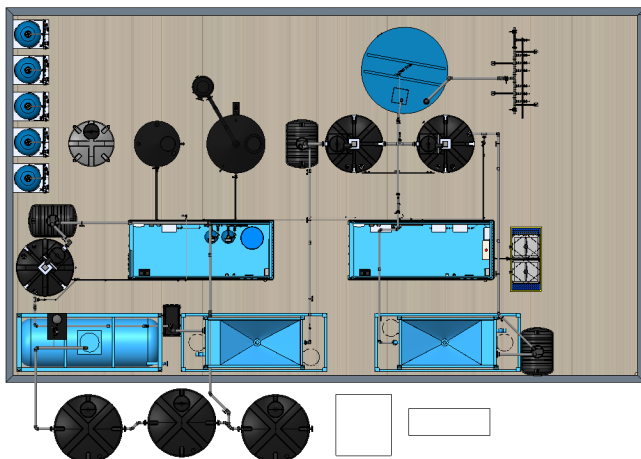
Presented below are some examples of previous projects.

SPARK, Walsall

The remediation scheme at SPARK included the abstraction, treatment, and re-use of heavy metals impacted and highly acidic groundwater, a consequence of the site's previous use as a copper foundry. A bespoke water treatment plant was designed that comprised primary and secondary stage suspended solids settlement, utilising a liquid polymer and pH amendment (raising the pH from ~5 to ~9.5) to create ideal conditions for metals separation. Effluent pH was subsequently reduced back to neutral using concentrated acid.

The treatment system had three-fold uses, firstly to provide water of good quality to be used in the mixing of grout for the backfilling of some 130 mineshafts across the wider site, secondly to reduce the contaminant loading of the groundwater body, and thirdly to dewater deep excavations during the reprofiling of the entire 18 hectare site.

Excess effluent that was not required for grout



Aerial view of water treatment plant at SPARK



Water treatment plant at SPARK

mixing was to be discharged to foul sewer, but due to the urban setting and sensitivity of the local sewer network and local effluent treatment facilities, a discharge consent with limits better than current drinking water quality was imposed. In order to meet these requirements, an ion exchange system was designed to further improve effluent quality; this was very challenging as the site had high elevations of boron in the groundwater, an infamously recalcitrant metal.

Wheal Jane, Cornwall

Since 2021 John F Hunt Water Technology have been managing the Mining Remediation Authority's largest water treatment plant in the UK, which treats circa 6 billion litres of acidic mine water every year, removing many tonnes of heavy metals that would otherwise be discharged into the local river.

The fundamental treatment process utilises high density sludge from the output of the system to enhance the treatment at the input end. The site recycles a large percentage of all water used in the treatment process, and the polymer dosing system incorporates a small ion exchange system to remove all metal ions prior to the batching of polymer. This process is fully automated only requiring an annual service and two-yearly exchange of the resins as the resin beads degrade over time and become less efficient.