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ReMining: Raw materials from tailings



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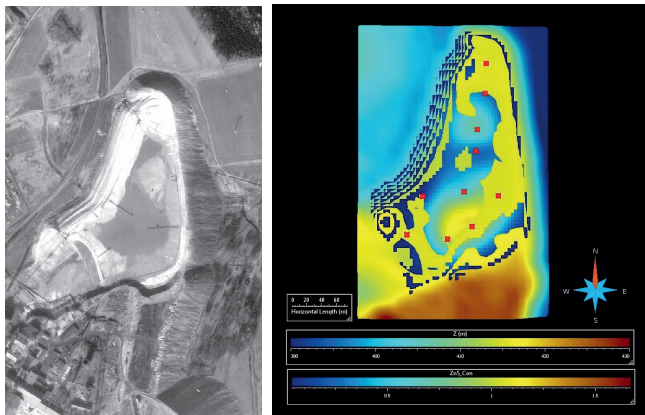
THE BACKGROUND

Valuable and hazardous materials

Tailings can be an important source of raw materials, as they still contain worthwhile quantities of valuable metals. Until recently, these were considered neither recoverable nor of interest to the industry. We are talking here about lithium, indium and other strategically important companion elements of the tin, zinc and lead that were originally extracted at the site.

The metal content in tailings is mostly higher than the margin that is currently applied in assessing a new deposit for viability, whereas the technical costs are lower than those incurred in mining primary ore. Consequently, extracting valuable minerals from tailings saves energy.

However, such sites also represent an environmental hazard because they are a repository for pollutants. And there is also the problem of what to do with the vast quantities of non-metallic residue? Can tailings be assessed accurately and developed efficiently, economically and in environmentally friendly fashion? The challenge is to identify holistic solutions for such sites. This is referred to as 'ReMining', which is a major research focus at the Helmholtz Institute Freiberg for Resource Technology (HIF).



Tailings such as the one at the Davidschacht mine in Freiberg still contain considerable quantities of valuable materials. They can be beneficiated using ReMining technologies. The 3D model of the Davidschacht tailing shows the concentration of the most important zinc ore, the mineral sphalerite, with traces of indium and gallium in percentage by weight. Picture credits: PNOA assigned by © Instituto Geográfico Nacional (title page), © SAXONIAStandortentwicklungs- und Verwertungsgesellschaft mbH, 1967 (inside page left), HZDR (inside page right).

THE GOAL

ReMining

Recovering valuable elements, removing hazardous substances and recycling residual waste (e.g. as a building material) are all part of ReMining. The HIF researchers are pooling their expertise along the entire raw materials value chain. They characterize ores and tailings and create 3D models to show up the valuable and hazardous elements. They assess resource potential and develop strategies for holistic processing to run alongside the simultaneous separation of pollutants.

The research team and their partners have led the way in drawing up a comprehensive register of all high potential tailings as well as mining and slag dumps in Germany. This contains extensive information on tailings from the mining, processing and smelting industries. They are also working on business models for the rehabilitation of these tailings.

Complete removal follows the modern zero-waste approach.

Our strengths

// Many experts work together at HIF to create 3D models of tailings and the valuable materials they contain. To this end, the results of mineralogical and geochemical analyses are combined with data from remote sensing and (in the future) also geophysics.

// The biotechnological processing of sulphide ores and tailings can be tested at our pilot plant. We also investigate the processing of ultra-fine particles in our own flotation laboratory.

// We belong to a global network of partners drawn from industry and science.

Interested in working with us? Get in touch!