

CCSA SYSTEM FOR TREATMENT OF ACID MINE DRAINAGE

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Abstract: This is a useful model for acid drainage generated by coal mining, including a system where the coal washing plant itself is used with advantage in the chemical and physical treatment of all the acid drainage generated at the mine site. This system applies a principle of conservation of the energy that is used in the coal dressing plant, involving all unit operations (water sumps and pumps, wet screening, jigging, cycloning, spiral classifiers and dewatering screening). This generates optimum interaction between the particles that are present in the ore and the acid drainage water that is used for processing in the plant. In this work, the influence of this increased interaction between the water and the ore particles is demonstrated. The working mechanisms are increased flocculation and aeration that result from processing. These aid in the correction of both pH and acidity, and also favor the oxidation of dissolved metals which, in turn, adhere to the flocs formed during processing and that can be discharged through thickeners or tailings pond. The tailings slurry contains particles smaller than 1 mm, which settle readily, producing clarified water. This clarified water can be easily separated from the underlying slimes, and can be considered as treated water, within the legal limits that are imposed by the local legislation. The slimes can be used as impermeabilizer in the coarse tailing stockpiles. Finally, the system consumes industrial alkaline residues that are produced in other industries, and which would otherwise be discarded as hazardous waste. Here, this material is used as an important resource in a neutralization process.

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