Coal tailings treatment and dewatering – A new capability

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ABSTRACT

Thickened coal tailings in slurry form impacts mines and communities with major cost and environmental repercussions. Dewatering of tailings slurries by chemical/mechanical or secondary flocculation methods is also costly and often deficient. Inevitably, dewatered, co-disposed or capped tailings is exposed to water and air infiltration hence prone to acid and metalliferous drainage (AMD) at an exponentially higher rate compared to coarse waste.

Most tailings continues to fill voids or dams in slurry form. Clearly, the highest risk situation is above-ground dam emplacement. Nevertheless, tailings in voids is often difficult to consolidate during mine life. Covering with water is a theoretical method to prevent oxidation and AMD generation, but not a definitive environmental remediation solution.

This coal tailings treatment and dewatering project is a partnership between Veolia and Clean Process Technologies (CPT), which seeks to resolve these otherwise intractable tailings issues.

Proven at bench scale, the project is now at pilot stage, incorporating a range of new treatment technologies and processes to treat tailings to recover a significant proportion of fine coal that meets mine product specifications, and furthermore, achieve a low sulfur content in the recovered coal.

The project also aims to treat the residual tailings after coal recovery to a very low sulphur content, hence removing the AMD source, and then to dewater the residual tailings to a dry, friable condition suitable for handling, capping and remediation.

The pilot plant includes a combination of new technologies in fine coal and tailings treatment: new process design, new range of separation equipment, and new sampling, chemistry and control systems.

With a nominal capacity of 10 m³/h, the pilot plant will be completed mid-2020 in modular and transportable form to suit relocation to multiple sites. With on-board power and independent operation, it will not interrupt washery operation.

Key words: coal tailings, fine coal recovery, coal tailings treatment, coal tailings dewatering.