

Tailings Management – Phosphate

Phosphate is a critical element in improving the productivity of modern agriculture. Phosphate tailings are a by-product of the mining of sedimentary phosphate deposits. Phosphate tailings are generally dominated by clay mineralogy, are extremely fine grained, and have poor drainage characteristics. Nearly all of these tailings have challenging handling properties requiring significant water resources to enable cost effective transport.

The tailings are deposited in dedicate tailings storage facilities usually with a prime purpose of maximising water return to the process with a by-product of elevated final density and strength. Any in-situ management of the tailings is difficult due to the propensity of the materials to “stick” to metal surfaces as well as the uncertain strength available to support safe operations.

Phibion’s Accelerated Mechanical Consolidation Process (AMC) has been successfully applied to phosphate tailings operations to both reduce the volume of fine tailings and improve water recovery rates.. A reduced phosphate tailings volume reduces the operational area of the TSF, also reducing the proportion of water lost to evaporation and reducing the capital expenditure required to sustain the facility.



AMC operations in phosphate tailings

In fine phosphate tailings AMC can deliver :

- Rapid consolidation of fine phosphate tailings <1,000 mm to very high density within 5 weeks;
- Undrained shear strengths >35 kPa; and
- An increase in water recovery >16%.



Day 1



Day 29

Timelapse sequence of AMC managed phosphate tailings

Phibion can provide AMC services to your organisation. We will provide the customised MudMaster®, employ and train local operators, manage maintenance/sparing and monitor performance. Additionally, we can provide supporting works, strategic planning and reporting.

Our services will reduce tailings management risk with no capital expenditure and none of the operational/financial risks of filtration or centrifugation. This approach is safe, infinitely scalable and can be sustained under all conditions.

Phibion can deliver this performance at a fraction of the cost of other potential alternatives and allow your operation to realise its potential today, without compromising the future.

Munro, L.D. and Smirk, D.D. ‘How thick is thick enough?’ *Paste 2018*, Perth, Australia