

Closure – Mineral Sands

Fine tailings, a by-product of mineral sands processing, is usually stored in mined out voids adjacent the mine operations. Fine mineral sand tailings are dominated by clay mineralogy, are extremely fine grained and have poor drainage properties.

Currently, when these voids reach capacity, fine tailings deposition ceases and the mining company then must wait for solar drying and passive consolidation until such stage as the surface exhibits sufficient strength to permit access for closure operations. However, this approach does not always work and often the void cannot be safely closed.

Phibion has devised an in-situ process, called Accelerated Mechanical Consolidation (AMC) or more commonly 'Mud Farming' to accelerate the dewatering of fine tailings in the void. Using the MudMaster® this approach removes entrained water from tailings, rapidly reducing the tailings volume. Reducing the fine tailings volume leads to the development of a strong, stable surface that permits access for conventional earthmoving equipment and commence closure operations.



Naturally desiccated fine mineral sand tailings

When applied to fine mineral sand tailings these operations deliver:

- Consolidation to high density but that further dewatering requires solar drying maturation (usually several months); and
- A trafficable surface with strengths at depth beyond 10 kPa after the maturation period.

The process works by disturbing the hindered settling properties of the tailings to release entrained water and then safely transitioning to a consolidation/compaction operation delivering a high final density and strength.



AMC managed fine mineral sand tailings

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

Our services will maximise your performance with no capital expenditure and none of the operational/financial risks of conventional management. 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