

eMalahleni Water Reclamation Plant – Towards Zero Waste

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The eMalahleni water reclamation plant was designed and built to recover potable water from acid mine drainage from several mines in the eMalahleni (Witbank) area. The project is ground breaking in the following areas:

- Scale, at 25MI/d it is one of the largest installations of its kind.
- Product is used as potable water
- Waste production is extremely low at < 1% brine
- Project is a joint initiative between mining companies (Anglo Coal and BHP Energy Coal)

The plant was commissioned in September 2007 and has been operating successfully since. Production was ramped up to the design level (20MI/d) by June 2008. De-bottlenecking activities and an uprate programme have extended this capacity to (25MI/d).

Liquid waste production is less than 1%. This is only 16 – 20% of the design value of 3%. This exceptional water recovery is achieved using the Keyplan Hi recovery Precipitating Reverse Osmosis (HiPRO) process. This process achieves these high recoveries using membranes only as the recovery unit operation, resulting in low chemical and energy input.

The process also produces three solid cakes:

- A gypsum rich cake contaminated with Iron, manganese, aluminium and other metals.
- A gypsum rich cake contaminated with Magnesium
- A very pure gypsum cake.

These cakes are low toxicity wastes which can be easily disposed of. However due to their gypsum rich nature they also show great potential as inputs into the building products industry. Various projects are underway to commercialize these inputs and it is expected that at least 80% of this waste would be commercially within 2 – 3 years from now.

Also the liquid waste production is constantly being reduced through improved operations and membrane selection. Zero liquid waste is expected to be achieved within another 12 – 18 months.

The target of Zero Waste is becoming a reality.