

## MODIKWA PLATINUM MINE

# Water recovery in platinum mines

One of Talbot & Talbot's recent projects involved the technology selection, design and turnkey installation of a dewatering plant at Anglo Platinum's Modikwa Mine.

**T**he project allows for the effective recovery of water and platinum group metals. This plant has allowed the mine to minimise the stress placed on the mining region's extremely limited water supply by managing its water resources more efficiently. The success of this project, its positive impact on the mines' triple bottom line, including the reduction in the mine's environmental footprint, illustrates the prospects for roll out to other mines in the Bushveld Complex region.

The mineral-rich Bushveld Complex region, which is home to the majority of the platinum mines, is incredibly dry and arid and mining therefore has a variety of negative impacts on the mines' financial implications.

There is growing awareness and disapproval of the mines' role in depleting the region's already scarce water supply, including criticism from the Kruger National Park and towns situated around the Bushveld Complex. High expenditure costs are being tied up in the extraction of water from the Olifants River, including transportation and handling costs. It is clear that there is increasing pressure on the mines to become more sustainable in terms of water resources.

The company's mine slurry dewatering plant, recently installed at the Modikwa Mine, provides an example of how water scarcity and sustainability issues can be addressed effectively and collectively. The plants are situated on both the north and south shafts of the mine where



**ABOVE** The clarified water is stored in tanks awaiting reuse

**RIGHT** The filter press produces a dry filter cake with a moisture content of 22%



they are operated independently by the Talbot & Talbot plant operations division. The plant's process begins with the mine's slurry (approximately 220 000 t/month) entering two high-rate clarifiers. The clarifiers separate the slurry into dewatered sludge and clarified water, which are then directed to a filter press and storage tank respectively. The filter press further dewateres the sludge, producing a dry filter cake with a moisture content of 22%. This cake allows for the effective removal and recovery of platinum metals. The clarified water is simultaneously stored in a storage tank, awaiting reuse in the mine's mining operations, with 98% of the process water being recovered. The concentrators receive a steady flow of filter cake.

Benefits of investing in a project that involves a mine slurry dewatering plant are primarily financial, with secondary social and environmental benefits. Essentially, the plant allows the mine to reduce its production costs by recycling its water, and providing the mine with the option to process already mined

ore, achieving platinum recovery of approximately 4 g/t of filter cake. Sustainable water recovery and reuse allows for the reduction in excessive transport and handling costs required to obtain water, as well as the costs involved in the disposal of the slurry to landfill sites. In addition, the plant allows the mine to manage the dewatered slurry effectively, resulting in the easy integration and flow of materials through the concentrators. Overall, the mine is able to improve its environmental footprint, social impact and financial performance, while contributing to the mine's sustainability and continuous improvement. Costs involved in implementing a mine water management project are minimal in comparison to the benefits received, with installation and operation being the only major costs. The capital outlay was recovered in approximately two years, with operation expenses being the only on-going costs. **35**