

Harmony Gold Phakisa Mine

SOUTH AFRICA

Rethinking technology to help restore profitability

The Phakisa gold mining project was initiated in 1993 but the project was suspended in 1995 and again in 1999. Even with a rich vein of gold to mine, the costs of development made the mine financially unfeasible.

A change in ownership brought with it a change in approach. Harmony Gold decided to re-engineer the project in the hope of finally making Phakisa profitable. To do so would require changing the scope of work to exploit an ore reserve containing 132 tons of gold.

The plan called for a 5 km track running 2.4 km below the surface, moving 400t/h from one shaft to another.

In order to more quickly and cost-effectively excavate the deeper levels within the mine, the Phakisa operation turned to the then-emerging technology of the Rail-Veyor[®] material handling system.

“The Rail-Veyor is cheaper and safer than using trucks or conveyor belts to transport ore, since electricity consumption is minimal and it is driverless. And it is simple to use, and easy to repair and maintain.”

Graham Briggs
CEO, Harmony Gold

“The Rail-Veyor system combines the best features of conveyor and rail systems because it conveys material as a conveyor with high flexibility and increased capacity, but can negotiate curves as in a rail system.”

Marius de Leeuw
Phakisa Mine Project Manager



Rail-Veyor[®]

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Phakisa's excavation plan was not suitable for conventional locomotive or conveyor systems. With tight turns and a narrow aperture of just 3.7m by 3m, it was perfectly suited, however, for the Rail-Veyor® system.

And not only was the Rail-Veyor the most efficient and least expensive option to operate, **its installation time was only a fraction of its competitors.** Conservatively estimated as a 12-month installation, Phakisa's Rail-Veyor system was **up and running in only six months.**

Installed in 2007, the Rail-Veyor® system continues to deliver strong value with consistent performance.

The Rail-Veyor system has reduced operating costs by a third or more, all while keeping advance rates high. Remotely controlled by a single operator, the system runs on restorable electricity. And unlike a single conveyor that must run continually, Phakisa's system has three separate trains of 360m each, that are powered only when needed.

Any maintenance or unexpected problems that occur to any one of the three segments can be repaired individually, while the other segments continue to run — instead of shutting an entire system down.

Bob Atkinson, new Projects Director for Harmony Gold states that the result of the investments in the Phakisa project it will be "a world-class gold mine with a 20-year life ahead of it."

"Phakisa's technological innovations enable the mine — a deepening project which is ramping up to full production in 2014 — to extend 2.4km below surface."

Graham Briggs
CEO, Harmony Gold

"A further advantage of the Rail-Veyor system is that it is fully automated and very safe, as there is a low fire and accident risk associated with it. The system is designed for a capacity of 115,000 tons a month."

Marius de Leeuw
Phakisa Mine Project Manager

Rail-Veyor®

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CASE STUDY