

# Shaft sinker makes progress at Shaft 17

LIAM MORRISON | FEATURES REPORTER

**M**ine shaft sinking company Shaft Sinkers will begin the main sinking of platinum producer Impala Platinum's number 17 main shaft in February next year, Shaft Sinkers' senior operations manager, Tok Bester, tells *Engineering News*.

The presink phase of the contract, which includes the foundation for the head gear and civil works on the surface, has almost been completed, says Bester.

Shaft Sinkers has been contracted to sink mine shafts for Implats at the platinum producer's greenfield operation, in Rustenburg, to replace the shafts that will come to a close over the next few years.

The company had been preparing the site for presinking since April 2008 and the presink began in September 2008.

Multidisciplinary construction and engineering group Grinaker-LTA and Shaft Sinkers have been working simultaneously on the Shaft 17 site, constructing the headgear and sinking the presink phase respectively. Shaft Sinkers has, therefore, had to install a temporary framework, or A-frame, above the shaft to allow Shaft Sinkers to perform the presink while Grinaker-LTA erects the head gear.

Grinaker-LTA Mechanical & Electrical business unit's metals and minerals division project manager Colin Henderson says that the headgear for shaft 17 is in the advanced stage of fabrication, and erection on site should be completed in December 2008.



#### NONSTOP

Shaft Sinkers erected an A-frame (red) during the headgear's fabrication and erection (blue)

Owing to the fact that the headgear is required for the main sinking of the shaft and that the changeover from presinking to main sinking is not yet complete, Bester says that Shaft Sinkers will begin the main sink at shaft 17's main shaft early next year.

"The necessary civil works on the surface of shaft 17 will be in place in February 2009, at which time Shaft Sinkers will proceed with the main sink of the main shaft. Until then, the changeover from the one to the other will be completed," says Bester.

The presink phase of a mine shaft involves a large boxcut excavation into the earth to establish a foundation for the headgear as well as the presinking of the shaft to a depth of about 60 m.

The headgear is then installed on top of the foundation, enabling the permanent or main sink

## IMPALA PLATINUM

equipment to be installed. This equipment includes an 18-t, eight-boom jumbo which has a variable diameter and is used for drilling holes for blasting. The boom looks similar to an octopus, with drilling machinery on each of its eight arms.

The combination of drilling boom and blasting increases the shaft depth by about 3,2 m a day.

Bester says that the eight-boom jumbo can sink the shaft with a horizontal deviation as small as 20 mm to 35 mm over its full length. This accuracy is ensured with the use of plumb wires and frequent shaft surveys. He says that with the permanent steel structure installed in the shaft, any prevailing deviation can be reduced to 2 mm to 4 mm.

Shaft Sinkers was awarded the contract for shaft 17's three shafts in August 2007.

The company began working on site in September 2007, and estimates that the shaft will be completed in October 2014. Bester says that shaft 17's main shaft has been presunk to a depth of 74 m. The refrigeration shaft's depth currently stands at about 200 m and the ventilation shaft at about 100 m.

When completed, the main shaft will have been sunk to a depth of 1 921 m, the refrigeration shaft to 1 360 m and the ventilation shaft to 1 753 m.

The main shaft will be excavated to a diameter of 10,8 m, or 10 m with its concrete lining. The ventilation shaft will be lined to a 9-m diameter and the refrigeration shaft to 6 m.

Bester says the contract is worth R1,5-billion, which also includes excavating the mining levels (the table D area up to the tip areas). He says platinum will be extracted from about six or seven working levels on shaft 17.

Shaft Sinkers has also been contracted to sink shaft 16 on the same Implats complex. The company has been carrying out the contract since October 2004 and Bester estimates that the contract is 60% complete.

He says the depth of 16's main shaft now stands at 1 500 m and the ventilation shaft at about 1 300 m.

The contract for shaft 16 is worth R900-million and is estimated to be completed in February 2011, at which time its main shaft will have been sunk to a depth of 1 648 m and the ventilation shaft to 1 451 m.

A refrigeration shaft has not been planned for Shaft 16. Refrigerated air will instead be introduced through the main shaft, says Implats greenfield projects director Luke Zindi.

Further, Bester says that Implats has contracted Shaft Sinkers to undertake a budget estimate for phase two of shaft 16, which entails developing tunnels towards the reef.

In addition to sinking mining shafts, Shaft Sinkers also has divisions for establishing mine infrastructure and stoping (a mining method in which ore is blasted from different levels of elevation and which is then removed from one level at the bottom of the mine). The company also has a mining division.



#### PRESINK PHASE

A boxcut excavation establishes the foundation for the headgear and sinks the shaft to about 60 m

Time flies. It's up to you to be the navigator.