Exxaro’s Tshikondeni coal mine has travelled a long and unconventionally difficult road since its first production in 1984. As it walks towards the finish line, it will leave a lasting legacy – one that ended on a high note, writes Laura Cornish.

Unlike the majority of South Africa’s large open cast coal mines, Tshikondeni is an underground, hard coking coal operation, and an extremely difficult mine to operate. Located in the fairly isolated Soutpansberg coalfield in Limpopo, just outside the Kruger National Park, its seam angles are extremely deep, varying between 2 and 18 degrees, explains Exxaro’s captive mines general manager, Dr Nombasa Tsengwa.

Structurally, the 400 m deep mine is very complex, with faulting and intrusives also having a significant impact on mining with both displacement and devolatisation of the coal. Major faults in the area tend to be listric normal faults forming steps and grabens, which delineate the different mining blocks. Intrusives occur in the form of dolerite dykes and sills with thicknesses of between 15 and 30 m, respectively. The intrusives result in a devolatisation halo that is related to the thickness and/or dip of the intrusive. “These factors have largely influenced the mine’s production volumes, which by comparison with Exxaro’s other coal mines, is extremely small,” Tsengwa continues. Tshikondeni has traditionally mined between 500 000 and 580 000 tpa
While most mines heading towards closure gradually decrease their annual production, with Tshikondeni it is quite the opposite, thanks to a project started last year.

"In April 2011, we commenced with our mini-pit project, which entails the addition of three small open-pit operations, that have already successfully seen us increase our annual ROM production to 850 000 tpa, equating to about 350 000 tpa of saleable product," Tsengwa outlines.

Each pit will be mined in sequence, the first already completed, which will take until the middle of 2013 to complete. Trolelo Mining Services was appointed to mine all three pits.

Each pit is situated close to one of the mine’s old shafts and has been named accordingly after the shafts. All three are no more than 2 km from the mine’s main office buildings.

The first mini-pit, Kremetart, took just seven and a half months to complete and delivered an additional 280 000 t of coal. The second pit, Nari, is scheduled to be completed in November this year, and will deliver a further 200 000 t. Preparation for the third pit, Mopani, has already commenced, and it will deliver about 180 000 t over a six-month time frame.

In line with Exxaro’s extensive commitment to best environmental practices, all the pits will be backfilled and rehabilitated.

Rehabilitation around the shafts is also an ongoing activity on site.

Despite the operating challenges associated with the mine, it has also made remarkable improvements in the area of safety over its life, which last year recorded an impressive 0.12 lost-time-injury rate – below Exxaro’s own target.

Building up to, and post closure
“We are putting together a comprehensive mine closure plan, which we will finalise at the end of the year. It will look at the mine’s environmental footprint and other post-closure activities, including infrastructure, employees, after-care requirements, and compliance to our social and labour plan, and we also have to be approved by government," Tsengwa mentions.

Management has also already commenced with future forum strategy discussions with its employees, engaging with them on possible future scenarios once the mine is closed.

The workforce is less hostile as a result. "We are investing heavily in reskilling our employees, teaching them different skills, and will even look to possibly relocate those who are willing to move to our other mines." Tshikondeni employs about 700 permanent staff.

In January this year, the Tshikondeni plant was ‘overhauled’ to help better process the coal from the mini pits. Different options are being evaluated regarding what can be done with the plant which still has some operational life left. 35

Exxaro’s captive mines
Exxaro has three captive mines: Tshikondeni, Matla and Arnot. Tshikondeni sells exclusively to ArcelorMittal, with the other two mines exclusively supplying Eskom. Tshikondeni’s production equates to 18% of the company’s entire coal consumption. In exchange, ArcelorMittal and Eskom fund the respective mines’ running costs.