

During F2019 a decision was taken to place Nkomati Mine on care and maintenance from September 2020 in preparation for closure. The mine's environmental responsibilities will be executed in line with the mine's EMP and relevant statutory requirements. R206 million (on a 100% basis) in restricted cash and guarantees has been provided for rehabilitation obligations. Final costs for rehabilitation will be assessed and finalised on completion of a technical assessment in this regard.

The closure of Nkomati Mine will be managed in a responsible manner. The mine's environmental responsibilities will be executed in line with its environmental management programme, relevant statutory requirements as well as good practice guidance from the ICMM on responsible mine closure. Final costs for rehabilitation will be assessed and finalised after completing a technical assessment.

Mine	Estimated closure cost as at 30 June 2019 (Rm)	Contributions			Total provision including guarantees (Rm)	Anticipated shortfall excluding guarantees (Rm)	Anticipated excess/ (shortfall) including guarantees (Rm)
		Trust Fund		Guarantees (Rm)			
		2019 contribution (Rm)	Estimated fund balance as at 30 June 2019 (Rm)				
Beeshoek	144.4	7.2	95.0	51.4	146.4	49.4	2.0
Khumani	350.5	7.8	101.7	254.6	356.3	248.8	5.8
Gloria*	43.2	1.9	24.3	76.1	100.4	19.0	57.2
Nchwaning*	88.0	1.5	19.7	–	19.7	68.3	(68.3)
Black Rock*	86.9	3.0	39.7	81.9	121.6	47.2	34.7
Two Rivers	205.8	10.1	33.9	67.2	101.1	171.9	(104.7)
Nkomati	226.0	–	98.7	107.1	205.9	127.2	(20.1)
Modikwa	192.1	–	33.1	168.0	201.0	159.0	9.0
Total	1 336.9	31.5	446.2	806.3	1 252.5	890.8	(84.5)

* Part of Black Rock Mine.

Financial provisions for rehabilitation and closure

In May 2019, the DEFF published the second draft of amendments to regulations in terms of the National Environmental Management Act pertaining to financial provision for rehabilitation and closure. The new regulations will apply to ARM operations from October 2020 and provision is being made to ensure that the operations comply with the new requirements.

Responsible tailings management

Tailings arise from the processing of mined ore. The ore is finely ground and mixed with water and chemicals to separate minerals from waste during processing and beneficiation. The waste that remains after beneficiation is a mix of finely ground waste rock and water known as tailings or slurry, which is disposed in tailings storage facilities.

Stakeholder engagement around tailings management

Recent international catastrophic failures of tailings storage facilities (TSFs) have increased the focus of investors, NGOs and other stakeholders on responsible tailings management. In 2016, the International Council on Mining and Metals (ICMM) published a Position Statement on "Preventing Catastrophic Failure of Tailings Storage Facilities" that includes a TSF governance framework. This framework enhances focus on those key elements of management and governance necessary to maintain integrity of TSFs and minimise the risk of catastrophic failures.


RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

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Following the tragic failure of a TSF in Brumadinho, Brazil in January 2019, the Investor Mining and Tailings Safety Initiative called for a new independent and publicly accessible international standard for tailings dams based on the consequences of failure to ensure that international best practice standards are developed, implemented and maintained. The initiative is an investor-led engagement governed through a Steering Committee Chaired by the Church of England Pensions Board and the Swedish Council of Ethics of the AP Funds. In response, the ICMM is engaging with the United Nations Environment Programme (UNEP) and the Principles for Responsible Investment (PRI) to co-convene an inclusive global tailings review to establish an international standard for tailings storage facilities to standardise and improve tailings management.

In April 2019, the Investor Mining and Tailings Safety Initiative wrote to 683 extractive companies (including ARM) on behalf of 96 institutional investors representing more than \$10.3 trillion assets under management to request greater disclosure on the management of TSFs.

In collaboration with our joint venture partners, we responded to this request and the TSF disclosure is available on our website.

 ARM's comprehensive TSF disclosure is available on our website at www.arm.co.za.

TSF management at ARM operations

There are eleven TSFs at ARM operations, four at Nkomati Mine, three at Black Rock Mine, and one each at Beeshoek, Khumani, Two Rivers and Modikwa mines. TSFs are designed and constructed with physical barriers appropriate to the risk to prevent pollution of groundwater. Surface water runoff around waste rock dumps and TSFs is closely monitored to alert operations to negative impacts. Ground water modelling predicts the potential impact of tailings disposal on aquifers and allows for mitigation measures.

An internal competent person is appointed as the responsible manager at each operation in terms of the Mine Health and Safety Act to oversee the operation of each TSF. Legislative requirements are assessed and incorporated into the TSF management system. Each operation has submitted and implemented the mandatory Code of Practice (COP) on the operation of mine residue facilities required by the South African Department of Mineral Resources and Energy (DMRE). Internal and external reviews take place. Operating manuals and procedures have been developed and are aligned with the COPs. A professional civil/geotechnical engineer is appointed at each operation to conduct annual structural stability audits and quarterly surveillance monitoring of the TSFs. A specialist TSF operating company has been appointed at all mines (with the exception of Beeshoek Mine) to operate the TSF in close cooperation with the responsible manager, inspected and audited by the specialist external engineer on a quarterly basis. Routine daily, weekly and monthly inspections are performed both by the operating company and the operation.

A review of tailings management at each TSF is conducted annually by the risk engineer from the International Mining Industry Underwriters (IMIU) during the annual risk survey. Detailed comments and recommendations relevant to TSFs are added to each operational risk profile and progress is tracked on a quarterly basis.

The most recent structural stability reports confirm the TSFs at ARM's managed operations as stable. In line with global best practice, independent external review of the TSFs is being implemented to enhance our TSF management systems. This review of the operations, management and structural stability of the TSFs will be completed during F2020. In addition, dam break analysis of our TSFs has been commissioned to ensure a comprehensive understanding of the potential impact on stakeholders including communities, the environment and infrastructure. This will inform enhanced emergency response planning.

During the annual internal SHE management forum in February 2019, priority was given to TSF, risk and emergency preparedness plans. During the first quarter of 2019, all operations commissioned revisions of legal compliance, risk assessment, zones of influence (in the event of failure at final capacity) and appropriate tailings-specific emergency response plans. The CEO and divisional Chief Executives hosted a tailings workshop in May 2019 to track progress on these revisions. The current focus is on:

- » completing the dam break analyses for each TSF;
- » revising emergency response planning and TSF-specific emergency response procedures, as well as detailed plans for stakeholder engagement processes as appropriate;
- » implementing a process of independent external review of ARM's TSFs; and
- » as a member of the ICMM supporting the "Mining with Principles" brand, ARM will also participate and implement all ICMM initiatives regarding TSFs.

Khumani Mine is located in an area at risk of sinkholes developing due to the dolomitic geological structures underlying the mine and dewatering activities related to mining in the area. This represents a potential risk to the safe operation of the mine's TSF. The Khumani Mine TSF is a paste disposal facility that minimises water use, as opposed to a conventional tailings disposal facility. The mine is implementing an action plan that includes drilling of additional core samples, refining of the geotechnical report as well as continuous satellite monitoring of the entire property, which provides both historic and current trends associated with subsidence. The continuous monitoring will enable timeous identification of areas where subsidence may occur prior to sink hole development.

The Minerals Council South Africa (MCSA) is engaging with the Department of Environment, Forestry and Fisheries (DEFF) and the Department of Water and Sanitation (DWS) to provide comment on the new regulations promulgated in terms of the National Environmental Management: Waste Act that affect tailings. The MCSA is also engaging the DEFF through the Presidential Regulatory Working Group to propose solutions to the concerns raised by the mining industry regarding the NEMA Waste Act and Financial Provision Regulations.