

TAILINGS AND WASTE MANAGEMENT

Mining activities – extracting, processing and refining – generate waste by-products in the form of tailings and waste rock, as well as some non-hazardous and hazardous materials. These wastes, as well as the processes for storing and transporting it, can pose environmental and public health risks.

Responsible storage, handling and disposal of solid and hazardous waste are central components of sound environmental management. Our commitment to responsible operation includes reducing mine waste by maximizing recovery and recycling processes throughout the mine life cycle. A set of global standards¹⁹ outlines our commitments and guides our practices for managing the risks posed by mineral and non-mineral wastes and hazardous materials in a manner that protects environmental and public health and reduces mining reclamation and closure liabilities.

¹⁹ Including B2Gold's Tailings Management, Waste Rock Management, Non-process Waste Management, Cyanide Management, Hazardous Materials and Dangerous Goods Management, and Closure and Reclamation Planning Management Standards.

TAILINGS

Responsible management of tailings is essential for protecting both the environment and human health. Over the past several years, there have been several catastrophic tailings facility failures around the world, including the tragic failure of the tailings dam at the Córrego do Feijão iron ore mine in Brazil in January 2019. In response to these serious failures, the mining industry has been working to research and develop practical tools and tailings and waste management solutions to advance best practices to achieve the safe and secure management of mine tailings facilities globally. Leading industry best practice includes the ICMM position statement on Preventing Catastrophic Failure of Tailings Storage Facilities as well as other multi-disciplinarian frameworks such as the MAC's Towards Sustainable Mining.

As part of our commitment to safe tailings management, we updated our Tailings Management Standard in 2018 to align with currently accepted industry practices. In 2019, we made additional governance improvements including updating our criteria for embankment annual inspections and third-party reviews. Regulators and industry associations, including specially assigned review boards, are developing additional standards and guidelines. B2Gold is committed to continue to actively review and incorporate additional best practices into our tailings facility management.

B2Gold manages four tailings facilities. Of these, three are in active use and one is inactive and no longer receives tailings. We employ several tiers of monitoring, inspection and audit review of all of our tailings facilities. Our facilities are inspected and audited by external experts against our internal policy and guidance documentation, as described in Table 18. These various reviews are designed to evaluate our conformance with our internal policy/standards (aligned with international best practice) and applicable regulatory requirements. We had zero significant incidents relating to our tailings storage facilities (TSFs) in 2019, and all facilities performed as intended with their inspections, audits and reviews conducted as scheduled. The annual inspections and audits revealed no significant deficiency findings.

B2Gold generated 20.5 million tonnes of tailings in 2019, an increase of 9% compared with an overall increase in annual consolidated gold production of 2.8%. Much of the year-on-year increase in tailings production corresponds to increased processing throughputs at our Fekola and Masbate operations, offset by the decrease due to the divestiture of the Nicaraguan assets on October 15, 2019.

WASTE ROCK

Waste rock management is a key environmental aspect of our operations. Each operation is required to manage waste rock and ore stockpiles in a manner that promotes beneficial post-mining land use and reduces closure and reclamation liabilities. Our practices are guided by our Waste Rock Management Performance Standard, requiring sites to address potential surface water and groundwater quality impacts and to design, construct, operate and close waste rock storage facilities in ways that provide long-term protection of stakeholders' health and safety and the surrounding environment.

WE CONTINUE TO WORK TO REDUCE OUR OVERALL WASTE GENERATION, AND FOR WASTE THAT WE DO GENERATE, TO TARGET MATERIALS THAT WE CAN RE-USE OR RECYCLE TO REDUCE THE POTENTIAL FOR IMPACTS TO THE ENVIRONMENT.

Our Masbate operation is our only site that generates significant quantities of potentially acid generating materials. Comprehensive management strategies for these materials have been in place for several years, and extensive monitoring continues to indicate that employed measures are working to ensure that potential impacts to the receiving environment remain at acceptable levels.

B2Gold generated 112 million tonnes of waste rock in 2019, a slight increase from the 110 million tonnes generated in 2018.

HAZARDOUS AND NON-HAZARDOUS MATERIALS

Management of non-process wastes is based on minimizing the generation of wastes and residues, reusing and recycling wastes or by-products, and, when materials cannot be recycled, disposing of them in an acceptable manner. Wastes are segregated, collected, transported, stored and disposed of or recycled according to established Waste Management Plans. All materials are recycled or disposed of in accordance with all relevant in-country statutory obligations, licences and other requirements.

Non-hazardous waste at our sites typically consists of scrap metal, wood waste, glass, tires, cardboard and paper. The primary hazardous waste produced at our operations includes waste oil, solvents, anti-freeze, paint, batteries and fluorescent tubes.

During the year, we generated approximately 9,100 tonnes of non-mineral hazardous and non-hazardous waste, consisting of approximately 3,800 tonnes of hazardous waste and 5,300 tonnes of non-hazardous waste. In 2019, we diverted over 3,400 tonnes of non-hazardous materials (the bulk of which is scrap metal, followed by paper/wood products) from landfills, and recycled over 1,500 tonnes of waste oil. We continue to work to reduce our overall waste generation, and for waste that we do generate, to target materials that we can re-use or recycle to reduce the potential for impacts to the environment.

TABLE 18 | Status of Major Tailings Embankments

Location	Facility Name	Active Status	Annual Dam Inspection ^[1] Up to Date	Dam Third-Party Review ^[2] Up to Date
Fekola (Mali)	Fekola TSF	Yes	✓	[3]
Otjikoto (Namibia)	Otjikoto TSF	Yes	✓	✓
Masbate (Philippines)	Masbate TSF	Yes	✓	[4]
Masbate (Philippines)	Atlas TSF	No	[5]	[5]

NOTES

[1] The Engineer-of-Record performs a detailed inspection of the tailings facility and tailings management practices.

[2] A facility review by a third-party engineer that is independent from the design, construction, operations and closure and that is also not affiliated with the Engineer of Record; conducted at least every five years.

[3] Construction initiated on the Fekola TSF in 2017; a third-party review will be scheduled for completion prior to 2022, in line with ANCOLD guidelines and internal B2Gold policies.

[4] The Masbate Mine has scheduled a third-party review of this facility to take place in the first quarter of 2020. Date based on current assumptions, subject to variation due to impacts of COVID-19 pandemic.

[5] Historical inspections and technical reports of the facility exist; however, they do not meet current internationally-accepted criteria. The Masbate Mine has scheduled a third-party review of this facility to take place in the first quarter of 2020. Date based on current assumptions, subject to variation due to impacts of COVID-19 pandemic.

TABLE 19 | Waste Produced

Type of Waste	Units	2016	2017	2018	2019
Total Waste Rock*	thousand tonnes	50,888	75,047	110,178	111,773
Total Tailings	thousand tonnes	13,135	14,271	18,705	20,467
Total Non-Mineral Waste**	t	2,709	6,570	8,934	9,087
Total Hazardous Waste	t	1,415	2,554	3,262	3,753
Waste oil	t	934	1,334	1,433	1,535
Hydrocarbon impregnated materials	t	451	657	553	574
Total Non-Hazardous Waste**	t	1,294	4,016	5,672	5,334
Total Non-Hazardous Waste Recycled**	t	851	2,932	3,834	3,430

NOTES

* 2016 data excludes El Limon Mine open pit waste tonnage.

** 2016 data excludes Masbate Mine recycled scrap metal tonnage.

CYANIDE MANAGEMENT AND REAGENT CONSUMPTION

Sodium cyanide is an essential chemical in the processing of gold ore as, currently, the cyanidation process is the most effective, economical and safest metallurgical technique to recover gold. However, in large doses and when not safely contained, cyanide can pose serious risks to human health and the environment.

Guiding our approach to transport, storage, use and disposal of cyanide are our Cyanide Management and Hazardous Materials and Dangerous Goods Management Standards. Our Cyanide Management Standard is aligned with the nine principles of the International Cyanide Management Code, a voluntary industry program that promotes best practices that safeguard workers, communities and the environment.

We use cyanide destruction processes at our Fekola, Otjikoto and Masbate operations prior to deposition of tailings slurries to TSFs. Tailings slurries at our Fekola and Otjikoto operations are deposited (within TSFs) with weak acid dissociable (WAD) cyanide target concentrations below 10 parts per million (ppm). The Masbate operation has a tailings slurry deposition WAD cyanide target concentration of below 50 ppm. These low concentrations of WAD cyanide (i.e. below 10 and 50 ppm), combined with natural processes of cyanide degradation such as volatilization, degradation from ultraviolet light, and dilution from direct precipitation, ensure that all our operations are able to maintain WAD cyanide concentrations within process ponds (including TSFs) well below the 50 ppm Cyanide Code guideline protective of wildlife.

In 2019, our operations used 9,947 tonnes of sodium cyanide. We consumed nominally more cyanide (an approximate 3% increase) in 2019 compared with 2018. However, our Fekola and Masbate operations both increased their consumption (by 2.6% and 18%, respectively), while our Otjikoto operation decreased its annual consumption by 16%. Quantities vary each year due to mineral variations in our ore bodies as well as processing variables (e.g. there was a significant increase in tonnage throughput at Masbate in 2019). Optimizing cyanide use, including minimizing the amount of cyanide used in our beneficiation processes, is a part of our ongoing efforts to improve our cyanide management performance.

Through our operations management systems, we track cyanide-related events and rate the actual and potential consequences on a consequence severity scale of one to five. Level 1 and 2 events have insignificant or minor impacts, and Level 3 to 5 events are those that can result in more significant impacts, and are publicly disclosed in this Report. All events are tracked, including the implementation of relevant corrective actions. Details of incidents that occurred in 2019 are presented on page 56.

TABLE 20 | Material Usage

Material	Units	2017	2018	2019*
Cyanide (CN)	t	7,171	9,674	9,947
Greases/Lubricants	kL	1,234	1,526	1,888
Diesel	kL	66,540	85,273	97,523
Gasoline	kL	22	11	19
Heavy Fuel Oil	kL	66,803	104,111	120,306
Lime (in all forms)	t	nr	nr	39,213
Sodium metabisulfite	t	nr	nr	6,035
Lead nitrate	t	nr	nr	2,837
Grinding ball consumption	t	nr	nr	18,526

NOTES

nr = not reported

* On October 15, 2019, B2Gold completed the sale of its Nicaraguan assets (La Libertad and El Limon) to Calibre Mining; therefore, La Libertad and El Limon mines reported data for Q1 to Q3 2019.