

SECTION 2.3.2

# Operations Review

## Mozambique

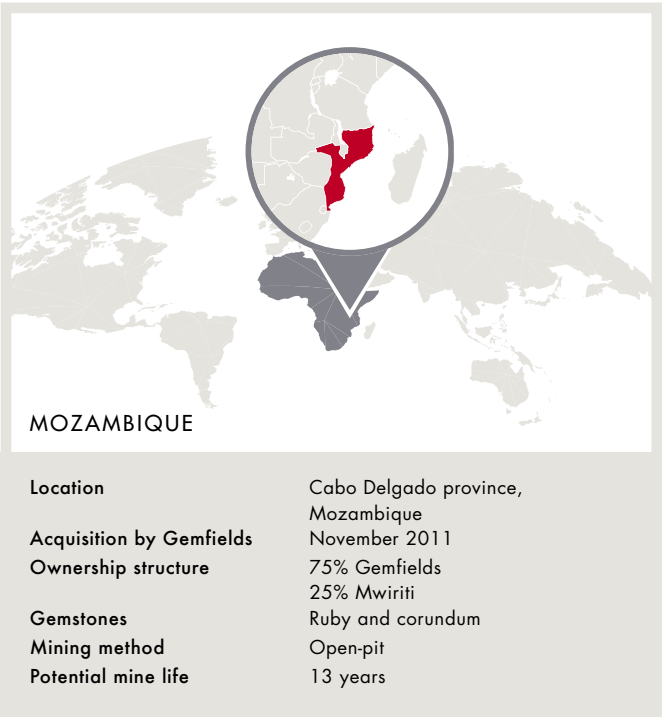
RUBY OPERATIONS IN MOZAMBIQUE COMPRISE THE FOLLOWING:

- **Montepuez Ruby Mining Limitada** (“MRM”). The Montepuez ruby deposit, which is in the northeast of Mozambique within the Cabo Delgado province, is believed to be the most significant recently discovered ruby deposit in the world and covers an area of 349 square kilometres. MRM is 75% owned by Gemfields and 25% owned by local Mozambican minority partner, Mwiriti Limitada. MRM, acquired by Gemfields in November 2011, is an open-pit mine and has a life of mine of 13 years to 2034.
- **Megaruma Mining Limitada** (“MML”) is registered in Mozambique. Gemfields holds a 75% interest in the licence area, which is located in the Montepuez district, sharing its eastern boundary with the existing MRM deposit and covering approximately 155 square kilometres of area.
- **Novo Megaruma Mining Limitada** (“NMML”) is registered in Mozambique. Gemfields holds a 75% interest interest in the licence area, which is located in the Montepuez district, sharing the northern boundary with the existing MRM deposit and covering approximately 190 square kilometres of area.
- **Eastern Ruby Mining Limitada** (“ERM”) is registered in Mozambique, with Gemfields holding an 80% interest. The mining area covers 116 square kilometres and shares its western boundary with the licence of NMML.
- **Campos de Joia Limitada** (“CDJ”) is a Gemfields holding company in Mozambique which has four licences at present, totalling an area of 452 square kilometres.

MONTEPUEZ RUBY MINING LIMITADA (“MRM”)

Covid-19 and MRM’s operations

All but critical operations at MRM were suspended from 22 April 2020 until February 2021. Security, maintenance and other essential services remained active to ensure prompt resumption of operation at short notice.



Operations resumed in a phased manner, starting with treatment plant operations in March 2021, and followed by mining operations in April 2021 after putting in place measures to mitigate the risk of spreading Covid-19 and applying already established protocols for handling of positive cases.

Proactive Covid-19 testing has been part of MRM’s Covid-19 strategy since July 2020, utilising RT PCR testing, rapid antibody testing and rapid antigen testing. MRM benefitted from Government Covid-19 vaccination programmes, with Government medical teams carrying out vaccinations within the mine premises during the campaigns. To date, 98% of direct MRM employees have had the first vaccination dose, with 61% being fully vaccinated. 53% of indirect employees (labour hire providers and private security providers) have had the first vaccination dose, with only 8% being fully vaccinated. Upcoming

Government vaccination campaigns will be focussing on the indirect employees.

Auction results

To counter the travel restrictions that prevented MRM holding auctions in 2020, a new mini auction system has been devised that enables the movement of goods instead of people. The auctions are multi-city with selected lots made available for in-person and private viewings in Bangkok, Dubai and Jaipur. Following the viewings, the auctions take place via an online auction platform specifically adapted for Gemfields, which permits customers from multiple jurisdictions to participate in the auction by placing their bids through the online auction platform.

The first series of seven sequential ruby mini auctions held from 15 March to 8 April 2021 generated revenues of USD58.9 million, with an average price of USD171.33 per carat. A second series of auctions, held from 8 November to 9 December 2021, delivered an all-time high for MRM ruby auctions, generating USD88.5 million of revenues and contained a selection of grades that are typically offered at a mixed quality auction. In total, 97% of the lots offered were sold at an average price of USD132.47 per carat.

In 2021, MRM generated a record USD147.4 million of auction revenues, bringing the total revenue achieved since incorporation to USD731.4 million.

During 2020, MRM did not generate any revenue as no auctions could be held due to the Covid-19 pandemic.

Mining

MRM’s key operational parameters for the year to 31 December 2021 are summarised in the table below.

MRM PRODUCTION SUMMARY

	12 MONTHS TO 31 DECEMBER 2021	12 MONTHS TO 31 DECEMBER 2020	12 MONTHS TO 31 DECEMBER 2019
Gemstone production (premium ruby) in thousand carats	84.0	28.7	81.3
Gemstone production (ruby and corundum) in million carats	3.3	1.3	2.2
Ore mined (primary and secondary) in thousand tonnes	739.9	229.6	1,071.6
Ore processed (primary and secondary) in thousand tonnes	1,002.0	346.4	845.7
Grade (ruby and corundum/ore processed) in carats/tonnes	3.3	3.6	2.6
Waste mined in million tonnes	5.0	1.7	6.1
Total rock handling in million tonnes	5.7	1.9	7.2
Stripping ratio	6.0	6.2	4.9

The mining operations at MRM comprise several shallow, opencast pits split between three main operating areas: the Mugloto Block, the Maninge Nice Block and the Glass Block. Mining is carried out as a mechanised open-pit operation utilising excavators, loaders, articulated dump trucks and associated ancillary equipment. Loaded trucks haul ore to stockpiles adjacent to the treatment plant while waste is backfilled into mined-out areas, thereby returning the area to its natural aesthetic.

Total rock handling during the year was 5.7 million tonnes (2020: 1.9 million tonnes and 2019: 7.2 million tonnes), comprising 0.7 million tonnes of ore and 4.4 million tonnes of waste material at an overall stripping ratio of 6.0. The remaining 0.6 million tonnes handled related to other materials, including slimes handling, waste dump rehandling and road improvements.

As with the previous year, efforts were primarily focussed on the Mugloto Block (79.2%) in order to extract higher-quality ruby-bearing ore, with the remainder coming from the Maninge Nice Block (16.1%) and from Glass Block (4.7%). This split was consistent with 2019.

Production

A total of 3.3 million carats (“Mct”) of ruby and corundum were produced during the year with a focus on producing high-quality, low-occurrence ore. Of the 3.3 Mct of production for the year, 3.1 Mct was recovered from Mugloto secondary ore and 0.2 Mct from other blocks. In 2020 and 2019, 1.3 Mct and 2.2 Mct were produced respectively, again coming in similar ration between the individual blocks.

The overall ore grade realised during the 2021 was 3.3 carats per tonne, compared with 3.6 carats per tonne for the four months of production during 2020, and 2.6 carats per tonne in 2019. The marginal reduction in grade compared to 2020 was attributed to processing a of higher volume during the nine months of operations in 2021.

*Processing*

During the year, 1.0 million tonnes of ore was processed at the treatment plant, a significant improvement over 2020 and 2019. On average the plant processed 91,093 tonnes per month, compared to 86,605 tonnes in the four-month operation period in 2020 and 70,475 tonnes in 2019. Processing improvements made in 2019 and the commissioning of the apron feeder project earlier in the year have achieved the desired impact of enhancing the throughput to 200 tonnes per hour (142 tonnes per hour in 2019), thereby increasing total processing for 2021, despite the plant only resuming operations from March.

*Operating costs*

Total cash operating costs, as defined below, were USD35.4 million (2020: USD20.7 million and 2019: USD32.8 million) with unit operating costs of USD5.45 per tonne of total rock handled (2020: USD10.8 per tonne and 2019: USD5.90 per tonne). Total cash costs have increased over 2020 as operations were active for nine months of the year compared to four in the previous year.

Total operating costs were USD80.9 million (2020: USD32.5 million and 2019: USD69.6 million). The higher costs are attributable to a longer period of full operations in 2021 when compared to 2020.

Total operating costs includes mining and production costs, mineral royalties, intercompany marketing, management and auction fees, selling, general and administrative expenses, and depreciation and amortisation, but excludes the change in inventory. Cash operating costs include mining and production costs and selling, general and administrative expenses, but exclude intercompany marketing, management and auction fees, depreciation and amortisation, and mineral royalty and production taxes.

*Capital expenditure*

Total capital expenditure for the year was USD4.6 million, comprising USD2.1 million invested in expansion and exploration and USD2.5 million in existing mining and ancillary equipment replacements and the Resettlement Action Plan (“RAP”). The 2021 expenditure compares to USD3.7 million and USD20.5 million in 2020 and 2019 respectively.

The RAP costs were covered by the provision previously set up for this purpose. The spend on the RAP has now largely been incurred with only a small number of incidental items remaining.

*Geology and exploration*

The MRM concession is located within the wedge-shaped Montepuez Complex, a junction between the north–south trending Mozambique Belt and the east–west trending Zambezi Belt. Both belts are known to be treasure-bearing and date from the Neoproterozoic Pan-African tectonic event.

The Montepuez ruby deposit was reviewed, with all technical information updated, as of 1 July 2019 to support a dual listing on the AIM market of the London Stock Exchange. As a result, a Resources and Reserves Statement (full Competent Persons Report (“CPR”)) was produced by SRK at 31 December 2019, which confirmed a 14-year open-pit LoMP and that the mine is well positioned for growth in production. At 31 December 2021, an annual reserve statement was prepared by MRM’s internal competent person, (see page 58) which indicates a 13-year LoMP.

The rubies around Montepuez are found in two types of deposits: primary mineralisation hosted within amphibolite or secondary placer type found in gravel beds.

Primary rubies from the amphibolitic source (and also secondary rubies in the associated overlying gravel bed) at Maninge Nice are typically tabular and hexagonal crystals, with strong basal planes. These gemstones are highly fractured with specific inclusions. Typically, the production from primary mineralisation is a lighter-pink colour and is often classified as sapphires. These sources provide a relatively large volume of stones and are therefore considered a high incidence but lower-quality deposit. In contrast, the production from secondary gravel bed deposits at the Mugloto, Maninge Nice and Glass pits is tumbled, deep red in colour, more transparent and contains fewer inclusions. As these secondary deposits provide fewer gemstones than the primary deposit, they are considered as low incidence but high-quality deposits.

Drilling operations, which resumed in June 2021 following the Covid-19 induced suspension from April 2020, focussed on the north-western part of Mugloto Block and, along with previous drilling results and airborne geophysics, confirmed sufficient continuity of the primary ruby mineralisation. This is a positive result given the quality of rubies currently being mined from the block.

A total of 2,498 metres of core drilling was completed during 2021 (1,128 metres in 2020 and 11,418 in 2019). Since inception a total of 60,081 metres of core drilling and 21,215 metres of auger drilling has been completed.

Based on exploration findings, stripping and mining activities commenced at two new bulk sampling pits, Glass B Pit-3 and Mugloto Pit-11, in August and December 2021 respectively.

In the period since Glass B Pit-3 commenced mining a total of 9,782 tonnes of ore have been processed. The quality of the rubies recovered from this pit is similar to other Glass block pits, potentially adding another significant source of high-quality rubies.

Mugloto Pit-2 expansion started in June 2021, with ore mining taking place from December 2021.

*Infrastructure*

Enhancement of the production facilities continued with the commissioning of the apron feeder in the treatment plant circuit in May 2021, which has allowed for continuous feeding. The concrete foundation work of the slime treatment plant (centrifuge decanter) project is now complete and commissioned. Both improvements have led to a much higher processing rate.

Construction of a new two-storey office building in the central mining area resumed during the year, with the objective of bringing the project management closer to the operational site. Completion of this project, which had been delayed due to the pandemic, is expected in the second quarter of 2022.

In 2020, while the Covid-19 pandemic was ongoing, all capital projects were reviewed and delayed where possible as cash preservation was of paramount importance.

*Protection services*

In addressing artisanal mining, which remains a significant challenge given the size of the concession and the high incidence of Internally Displaced People (“IDP”), a key consideration is the protection and safety of the artisanal miners, security personnel and MRM protection team members. IDPs are a direct result of the insurgency, which has led to over 700,000 such people taking refuge in areas near MRM and who pose an added threat to the operations, due to the risk that they could join the illegal miners.

The Protection Services Department (“PSD”) continued with the incorporation of supportive security enhancement equipment, including better quality body cameras, lighting towers, drones and wireless cameras, which have improved surveillance across the site. The main objective is to minimise the level of artisanal activity within and around the concessions, but also to enable earlier invasion identification and facilitate a speedy and safe evacuation of the artisanal miners. Patrol teams continue to use body cameras, which, along with drones has resulted in improved monitoring of the MRM



IMAGE Montepuez ruby mine, Mozambique



concession and adherence to the Voluntary Principles on Security and Human Rights (“VPSHR”). Training delivered by reputable third-party trainers to MRM employees about VPSHR, social media awareness, conflict resolution and juveniles in artisanal mining has also continued.

The PSD has successfully incorporated drones on site to monitor artisanal mining and assist patrol teams in locating such activities. In December 2021, the drone deployment included two short range drones as well as two medium range drones that covered the mining area on a 24-hour basis. In addition, two long range drones have been acquired and once on site will significantly increase MRM’s drone surveillance capabilities.

With the ongoing pressures within the area, the PSD remained focussed on maintaining a high standard of service to keep MRM personnel and property safe, and to prepare for any possible external threats. Further, supportive security enhancement equipment, including vehicle dash cameras and vehicle tracking, has improved surveillance of personnel movement across the site and ensures focus is kept on covering all patrol areas.

The Islamic insurgency in the northern part of the Cabo Delgado province (about 200 kilometres northeast of MRM) remains a concern, although it has been observed that the deployment of the Rwanda Defence Force and South African National Defence Force in the province has had a significant impact on controlling the insurgency. Sporadic insurgent incidents are recorded regularly but due to the run over of the insurgent strongholds by Government and supporting joint international forces, the incidents are limited to the northern Macomia district and Niassa province, to name but a few.

Using third-party advisors and security experts, both MRM’s PSD and the Group’s senior management regularly track developments in the region and the likely resulting risks posed to the site’s assets and its people. Although a direct threat from the insurgents is currently deemed unlikely, management is conscious of the possibility of opportunists mounting an attack on MRM’s assets in the province and/or the spread of insurgency.

Further information about risk mitigations relating to site safety and asset protection can be found in the *Risk and Uncertainties* section of this report.

MRM continues to work closely with Mozambican authorities to raise awareness among local communities of the dangers of artisanal mining and to assist in tackling ruby smuggling to reduce the risk to and exploitation of vulnerable groups by well-organised syndicates. The impact of the IDP on illegal artisanal mining was presented to

the British High Commissioner in August 2021 by MRM and other important mining houses for assistance with raising the matter with the Government.

*Health, safety and environment*

Health and safety policies and procedures continue to evolve and improve across the operation to create a safer and healthier working environment at MRM. Safety training has focussed on toolbox talks, assessing risks in work environments and improving the culture associated with near-miss reporting. Two LTIs occurred during the year. Of these, one was caused because of an attack by illegal miners on a mine supervisor. The second one was directly attributable to operational health and safety. In the interests of reducing the frequency rate of injuries, a series of internal and external health and safety training modules was incorporated into the health, safety, and environment programme. The focus of this series was risk management framework design and implementation, fostering job hazards analysis and first aid, firefighting, and safe driving.

MRM successfully achieved one million LTI free shifts at the end of October 2021. The Government recognised MRM’s efforts to prioritise the health and safety of its employees, the communities and the environment, presenting the company with the runner-up award for Best HSE Practices in the Mining Sector. The Prime Minister of Mozambique presented the award at a national event held in Maputo in May 2021.

Good progress has been made in post-mining environmental rehabilitation, with a total of 806 locally grown saplings being replanted over an area of three hectares of backfilled land. The IMS implementation of ISO9001, ISO14001, and ISO45001 (respectively, the Quality Management System, Environmental Management System and Occupational Health and Safety Management System) is ongoing. All concerned parties and process owners have completed the IMS certified training for interpretation and implementation. This training was delivered by external consultants and includes training the senior management of MRM. It is expected that the IMS will be certificated in the next reporting period. MRM also made progress regarding its mitigation of biodiversity impacts by conducting a second biodiversity assessment in 2021 across the concession and the findings and subsequent action plan are currently pending.

In December 2021, a second regulatory independent environmental compliance audit was conducted on MRM’s EIA and EMP compliance. The initial findings indicate that MRM is largely in compliance, with a few minor recommendations made that the team are looking to remedy in 2022.



*Sustainability and corporate responsibility*

MRM’s community engagement and project activities are aligned with the policies of the Government of Mozambique and supplement the Government’s efforts in improving the quality of life of the community. Through its community engagement process, the key focus for the community team during the year has been the continuation of existing health and livelihoods and basic education projects, as well as the implementation of several new projects. These new projects include egg production trials together with chicken-farming cooperatives; improvements and scaling up of community conservation farming; the provision of sports equipment and kit to local school children; and opening the operation’s sports grounds for the local school children to use over the weekends.

The Vocational Training Centre enrolled 156 students, of which 130 graduated. The students comprised 47 qualifying in electrical installation, and 83 in plumbing and civil construction. The painting course was cancelled due to the low adherence and attendance.

A key focus for the team has been the ongoing completion of the RAP. The preparation and demarcation of the 210 hectares of agricultural farmland block for resettled villagers was completed on schedule despite sabotage carried out by the encroachers. The District Government requested support from MRM to bear the cost of replacement agricultural farmland for the encroachers to vacate the RAP block. Because of the absence of farmland for the resettled villagers, MRM paid monthly basic basket allowances for 105 villagers from January 2021 to June 2021. MRM signed a Memorandum of Understanding (MoU) with the District Administrator and CIAM for the preparation of replacement agricultural farmland for the encroachers. The works are ongoing and had been affected by the start of the rainy season. From a total of 155 encroachers, 110 have already been allocated new agricultural farmland and were given agricultural kits composed of seeds, pesticides and fertilizers for them to vacate the RAP farmland.

The inauguration of the RAP project has not yet been scheduled, mainly due to the lingering agricultural farmland issue.



*Operational Grievance Mechanism*

To further its ongoing commitment to transparency and support for the local community, and under the voluntary settlement agreement that ended the Leigh Day litigation, MRM has established an independent operational grievance mechanism (“OGM”) designed in keeping with the laws of Mozambique, the UN Guiding Principles on Business and Human Rights (“UNGPs”), and industry best practices. An Independent Panel determine the outcome of the grievances submitted to the OGM, following investigation by an independent Fact-Finding Team.

The OGM was formally launched on 4 February 2021, following the completion of a pilot phase and a local public awareness campaign. An independent monitor, Synergy Consulting, has been appointed to report on the efficacy of the OGM and its performance against the UNGPs Effectiveness Criteria at six-monthly intervals. A summary of the Independent Monitor’s report for the six-month period ending 30 November 2021, can be found on Gemfields’ website here: <https://www.gemfieldsgroup.com/assets/montepuez-ruby-mining-limitada/>. The Independent Monitor has highlighted a number of risks in connection with the implementation of the OGM, including the high case-load, and has made a number of recommendations for the OGM parties to consider. MRM accepts those recommendations and will continue to seek the resolution of the identified issues through dialogue with the other OGM players.

*Human resources*

As at 31 December 2021, 1,322 people were employed by MRM, of whom 615 were directly employed and 707 were employed through contractors. During the year, various internal and external training programmes were attended, including training programmes on human rights, health and safety (ISO14001:15 and ISO45001:2018), finance, security and equipment handling.

*Events after the balance sheet date*

Following the formal approval for a 400 tph second treatment plant by the respective Boards of Directors of MRM and Gemfields, engineering design and procurement processes for the treatment plant have commenced. Upon successful completion of this project in the second half of 2022, MRM’s processing capacity will increase three-fold to 600 tph.

MEGARUMA MINING LIMITADA (“MML”)

MML is a venture between Gemfields, who hold 75% of the share capital, and EME Investments SA, Mozambique, who hold 25% of the share capital. MML ruby-mining licence 7057C is located in the Montepuez District of Mozambique, sharing a boundary with the



existing MRM licence and covering approximately 155 square kilometres. MML previously held two licences, 7057C and 7049C, however, in complying with changes in legislation, 7049C has been transferred to another company under the same shareholding structure. The new mining legislation requires each licence be ring-fenced with a unique tax number and the only way to achieve this is by housing the licences in separate companies.

Operations at MML resumed in July 2021, following the Covid-19 related suspension since April 2020, primarily with start-up maintenance of the treatment plant and processing of stockpiled ore. Work also began on trenching smaller pits to allow for more areas to be assessed to expedite the testing and assessment of the ore, resulting in a total of 10 trenches being opened and 249,302 tonnes of rock handled, including 25,304 tonnes of ore. Of this 20,943 tonnes were treated in the plant, resulting in the recovery of a moderate quantity of low-quality ruby of varying grade. With the continued efforts to improve the production throughput, more encouraging results are expected to be seen over time.

To further increase the exploration and evaluation activities, manual pitting was initiated from September 2021 with a total of 30 manual pits being opened in different target locations. Altogether 18.4 tonnes of ore were collected and processed using bushman jigs at the treatment plant, resulting in a modest recovery of low-quality ruby of varying grade.

IMAGE Responsibly sourced rough ruby, Montepuez Ruby Mining, Mozambique

The Protection Services Department (“PSD”) has continued to manage the security of the licence area with a view to achieving the scale and sophistication of the MRM PSD over time. Following an assessment of the licence, a number of areas were identified as having been illegally mined resulting in 95 illegal pits being safely closed. A total of 3.8 tonnes of confiscated ore was recovered and processed at bushman jigs at the treatment plant, with some low-quality rubies being recovered.

MML will continue its exploration and evaluation operations in 2022 and into 2023.

NOVO MEGARUMA MINING LIMITADA (“NMML”)

As discussed above, in order to comply with the new mining legislation that requires every mining licence to have a unique tax identity, this title, originally held by MML, was transferred to a newly registered company, Novo Megaruma Mining Lda, in May 2021. Licence 7049C shares a boundary with the MRM licence and covers approximately 190 square kilometres.

Exploration activities on concession 7049C were deferred due to force majeure conditions resulting from the Covid-19 suspension. However, NMML has put measures and processes in place to ensure that local statutory requirements are complied with in the intervening period.

As a result of the continued prevalence of the force majeure conditions, the application for the renewal of the Environmental Licence (Category B), lodged in December 2020, remains pending with the Provincial Directorate of Land, Environment and Rural Development (“DPTADER”). The current licence expires in March 2021, however this has no impact on NMML’s operations as the renewal application was submitted within the requisite timeframe, and the delay is attributed to the impact of Covid-19 on the relevant Government departments and the existing force majeure situation. All necessary communications regarding the ongoing situation on the ground continue with the office of the National Mining Institute (“INAMI”). NMML expects that the requisite environmental licence will be granted in due course.

Despite the ongoing application for the Category B licence, NMML’s right of access and ability to continue operating with licence 7049C remains valid until November 2039.

EASTERN RUBY MINING LIMITADA (“ERM”)

The mining licence 8277C held by ERM, a venture between Gemfields, who holds an 80% interest and Taibo Mucobora, with a 20% interest, is valid for 25 years. The licence covers an area of

116 square kilometres and shares its western boundary with the licence of NMML (7049C).

The Environmental Licence (Category B Certificate) was awarded by the Ministry of Land, Environment and Rural Development (“DPTADER”) for the period to December 2024. The licence permits ERM to commence exploration and bulk sampling activities in the demarcated boundary areas that were established from work carried out during 2019.

The land rights for mining activity (“DUAT”) application was filed for five sectors in November 2019. Out of the five, two DUAT certificates were approved covering 10,190 hectares, accounting for a major part of the total DUAT area, meaning that ERM has the right to operate on the majority of the licence area. The remaining three DUATs covering an area of 93 hectares are still pending and are expected to be issued at the provisional level, as opposed to national level, given the very limited area they cover.

During 2020, the construction of the camp and the procurement of heavy earth-moving machinery were postponed shortly after commencement due to the Covid-19 pandemic. The key start-up activities recommenced in 2021 and ERM is expected to start bulk sampling and other key exploration and evaluation activities in the third quarter of 2022.

CAMPOS DE JOIA LIMITADA (“CDJ”)

CDJ is a Gemfields holding company registered in Mozambique that, until May 2021, held four licences – 7427C, 6114L, 9059L and 9060L – totalling an area of 456 square kilometres. 7427C is a mining title and is located 10 kilometres to the north-west of MRM. The remaining three are contiguous exploration licences and are located immediately to the south of the NMML concession.

To align with the new mining legislation in Mozambique, which requires a unique tax identity for each licence, the three exploration licences were transferred in May 2021 to three newly registered companies: Novo Campos De Joia 1 (“NCDJ1”), Novo Campos De Joia 2 (“NCDJ2”) and Novo Campos De Joia 3 (“NCDJ3”).

The Environmental Licence (Category B) for 7427C is valid until 9 July 2024, allowing for the immediate commencement of exploration activities and bulk sampling in due course.

No significant work occurred on all four licences during 2021, as the Group preserved cash because of the impact of Covid-19. All significant exploration and evaluation activity is expected to resume in 2022.