WATER QUALITY ISSUES AT RIO TINTO'S QMM MINE MADAGASCAR – BRIEFING MARCH 2024

Background: Following two tailings dam failures at their Madagascar QMM mine in February and March 2022, Rio Tinto promised to provide reports on the tailings dam failures, water quality and the fish deaths that had occurred. Water quality issues, tailings dam failures and fish deaths, also compensation issues, account for five conflicts over the last two years around the QMM mine. Protests in October 2023 resulted in three protestors shot dead by state police. There was a total media blackout of these events and no inquiry. See **here,** and also: Timeline **here.**

Introduction: In December 2023, QMM issued its 2021-2023 Water Report. Typically, it took another two months to secure a spreadsheet of the relevant raw data from QMM, although the company was told these data would be needed as far back as 2022. The awaited radioactivity study from JBS&G was also released at the end of 2023. Rio Tinto claims this has demonstrated 'no radiological impact from the mine and no need for heightened health concerns' around local radiation levels. Limitations and weaknesses are highlighted in both the JBS&G study and the QMM 2021-2023 water report. Below are some of the key points for discussion, and other additional concerns:

1) QMM water monitoring and reporting issues

The QMM Water Report 2021-2023 continues the QMM practice of:

- Looking at most recent data in complete isolation from all other previous water data *or* baseline data
- Inconsistent detection limits - a problem highlighted multiple times for previous QMM water reports
- Also, QMM appears to have two versions of what should be the same dataset. Data presented in the graphs in the report do not correspond with data provided in QMM's data spreadsheet This is analogous to having two sets of accounts. It is impossible to determine which are the correct data or whether either are correct.

2) Findings on QMM impact on water quality

Emerman 2024 combined the latest QMM water data with *all* existing surface water-quality data. He included pre-mining water data, which NGOs secured from QMM after more than three years. Analysis of all the data showed:

- Confirmation of "*the detrimental impact of the QMM mine on regional water quality"* (Emerman 2024)
- Increases in the geometric means of the total uranium and lead concentrations from the upstream to the downstream side of the QMM mine by factors of 24 and 4.9, respectively, that were statistically significant at better than the 99.999% confidence level for uranium and 99.99% confidence level for lead
- Increase in uranium concentration upstream to downstream by a factor of 884 from before to after opening the mine that was statistically significant at the 99.999999999% confidence level[1]
- Total lead concentrations that clearly increased after opening of the mine, although the increase could not be evaluated quantitatively due to inconsistencies in the detection limits.

3) Radioactivity study

Swanson 2024, while commending improvements in radioactivity monitoring brought by JBS&G, has concluded that "*The level of confidence in the conclusions presented in the (JBS&G) report cannot be determined quantitatively because of limitations of the study design."* Guidance for Data Quality Objectives was not consistently nor completely followed. The data do not support the primary argument in the JBS&G report regarding incremental contribution of the mine to radiation dose (P3 Swanson, 2024). Key issues include:

- Gamma radiation levels are highly variable (over several orders of magnitude) so effects on total dose can also vary widely. The report does not provide any analysis or discussion of sub-groups of people who may receive gamma doses above 20 mSv/y, e.g., more sensitive or more highly-exposed individuals, such as the 15-year-old critical group where the estimated doses were up to 12 mSv/y.
- Evidence in support of the report's estimated contribution of the QMM mine at a maximum of 0.6 mSv/y (i.e., less than regulatory limit for incremental dose above background of 1 mSv/y) is difficult to find and interpret. In particular, the evidence for the contribution via water discharges is weak.
- There is a lack of data from the river during times when QMM process wastewater is being discharged.
- Focus on water water-based pathways leading from the QMM mine must be prioritised.

4) Transparency on 2022 fish deaths

Rio Tinto/QMM is still withholding the report of its commissioned WRG study on the 2022 fish deaths. This is a tacit failure of the company to honour its promises to communities, investors and civil society. Also, to meet its own standards on transparency and adhere to Business and Human Rights Guiding Principles on Human Rights.

5) New Treatment plant issues

Recent communications from QMM appear to contradict the announcement at Rio Tinto's 2022 AGM that the new QMM treatment plant would be a "permanent solution" to managing QMM mine process wastewater. The main

[1] The increase in uranium concentration was determined through a comparison of all baseline measurements (both upstream and downstream) to all post-mining measurements downstream.

problem is management of the waste residue locally – a matter raised repeatedly by civil society with Rio Tinto/QMM since the 2022 pilot phase began. The contents of the waste residue, e.g., contaminants, and associated risks are not transparently reported. It is not discussed whether the plant treats anything other than aluminium. The SEIA for the treatment plant not been publicly shared for stakeholders' evaluation and consultation.

6) Independent impact assessments/audits

Malagasy civil society has repeatedly called for independent assessments of the water quality at QMM. The self-reporting and the withholding of information by Rio Tinto/QMM is not acceptable. Investors are also demanding that the company undertake independent water impact assessments, and affected communities must have the company's commitment to remedy any harms that are identified. See also wider calls for water assessments, here.

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QUESTIONS to Rio Tinto/ QMM

On the 2021-2023 water report

- What, if anything, has QMM done to reduce high levels of uranium and lead in mine process discharge wastewater - as these are expressed in multiple data over many years, including the 2021 discharge data?
- Can Rio Tinto explain why the data presented in the QMM 2021-2023 Water Report do not correspond to the accompanying spreadsheet of relevant raw water data shared by QMM?
- Why does QMM continue the practice of isolating each new data set and failing to integrate it with existing data and pre-mining (baseline) data?
- Why does QMM still have problems establishing consistent detection limits?
- Why does QMM not share the relevant raw data within the report that it publishes, instead of requiring civil society to have to repeatedly ask for it?
- Why has there been no monitoring of intentional or accidental releases of process water into the Méandre River or Lake Ambavarano since December 2019 and no monitoring of Lake Besaroy since April 2018?
- What is the completion date for providing safe drinking to ***all*** the communities affected by the mine?

On the JBS&G Report

- What is the level of confidence that radiation doses have not been underestimated?
- How sure can we be that there is no need for heightened health concerns?
- To what extent will Rio Tinto apply ALARA where important uncertainties are still to be addressed?
- How will QMM improve its monitoring and communications practices and address identified limitations in the JBS&G radiation study in order to guarantee the safety of local citizens across the lifetime of the project, especially for the more vulnerable groups identified by Swanson?

On the QMM treatment plant

- Does the QMM treatment plant address uranium and lead in QMM mine process wastewater? If so, how?
- Why have there been no results shared from the pilot phase of QMM's new $13m Treatment Plant?
- Why has Rio Tinto/QMM not identified the polymer being used in this plant's process, and its function?
- Why is there no detailed information available about the content of the treatment plant's waste residue?
- Where is the Social and Environmental Impact Assessment (SEIA) for the new treatment plant?
- Has QMM undertaken a risk assessment in relation to contamination from the waste residue e.g., from aluminium hydroxide and other contaminants? If there is a risk assessment, where is it?
- Why did QMM not fully research Madagascar's capacity to manage the toxic waste residue, contained in geotextile bags, before it built the $13m dollar plant and started producing the waste residue in this way?

On Transparency

- Why is Rio Tinto withholding the WRG report on fish deaths that followed the 2022 tailings dam failures?
- If the WRG report is 'inconclusive' on the cause of the fish deaths (QMM website), on what basis can QMM continue to assert that it is not responsible for the fish deaths that occurred in 2022?
- Why did Rio Tinto promise an external evaluation of the QMM tailings dam failures in 2022 by Intersafe, and to share its report with investors/civil society, when there was no external study or report by Intersafe?

On independent audits/impact assessments

- Will Rio Tinto continue their practice of deciding which data, studies or reports are to be publicly released?
- Why should communities, CSOs and investors rely upon Rio Tinto/QMM reporting?
- Will the company adopt recommendations provided by independent experts Dr Emerman and Dr Swanson?
- Given multiple issues with reporting related to QMM water quality, on what grounds does Rio Tinto defend its decision to refuse independent water impact assessments?