



Rio de Janeiro, June 7<sup>th</sup>, 2019

**To: Investor Mining & Tailings Safety Initiative**

Church of England Pensions Board

Swedish Council on Ethics for the AP Public Pension Funds

**Re: Urgent request for information concerning tailings dam management**

Dear all,

In response to correspondence received in April 2019, please find attached the requested disclosures concerning tailings facilities operated by Vale and its joint ventures (annexes A, B and C).

We appreciate the opportunity to engage in this initiative as we are committed to working together to ensure that best practice standards continue to be developed and applied in the mining industry.

Vale is going through a critical moment that has created opportunities to identify and reconfirm the Company's priorities: safety, people and repair. We remain committed to the affected communities and focused on recovery efforts.

The pillar of Safety and Operational Excellence is an important and strategic initiative. A new Executive Office has been created and will keep an open and direct reporting channel concerning operational risk management to the CEO and to the Board of Directors.

As the Company has demonstrated over recent months, we have not spared -and will not spare- resources or efforts to repair any damages caused to the families involved, to the infrastructure of the communities and to the environment.

Vale is supporting, with complete transparency, the investigation of the causes of the tragedy. There are ongoing investigations being conducted by several Brazilian governmental authorities, by the independent extraordinary committee created by Vale's Board of Directors, and a panel of experts hired by a foreign law firm appointed by Vale.

Vale is also committed to strengthening its pact with society, in which we will seek to deliver a new value proposition by acting as a force for the creation of economic growth in the communities where we operate, going beyond mere tax payments and the repair actions. We plan to seek opportunities to establish partnerships and alliances to foster sustainable development in local territories. We firmly believe that these visionary steps will be critical to the reimagining of mining operations in Brazil and in the rest of the world.

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Please note that references in this letter and the accompanying materials to "Vale" are to Vale S.A., and references to the "Company" or "we" are to Vale and, except where otherwise explicitly noted, its consolidated subsidiaries. Also, please note that, for questions directed at joint venture operations that contain the word "you" or "your," the information provided herein reflects the responses of such joint ventures, and not Vale.



Please further note that this letter and the accompanying materials contain certain forward-looking statements. We caution you that forward-looking statements are not guarantees of future performance and involve many different risks and uncertainties. We respectfully refer you to Vale's Annual Report on Form 20-F filed with the US Securities and Exchange Commission on April 18, 2019 for a fuller discussion of forward-looking statements and various factors associated with the aforementioned risks and uncertainties.

Yours sincerely,

**Eduardo Bartolomeo**

**CEO**

**Vale S.A.**

## Annex A – Vale S.A.

### a) Overview of tailings management system, and how we manage risk

In summary, risk management is composed by 3 lines of defense:

- The 1st Line of Defense is formed by the owners of the risks and by the executors of the processes of the business, project, support and administrative areas of the Company. They are directly responsible for identifying, evaluating, monitoring and managing risk events in an integrated manner. They must implement and enforce effective prevention and mitigation controls, ensure adequate definition and execution of action plans and establish corrective actions for the continuous improvement of risk management. It should continuously assess the applicability of the risks of the Integrated Risk Map to the activities and geographies under its responsibility. It should anticipate to the Executive Office and the Board of Directors the potential impacts that are imminent to occur, following the current governance to address the treatment of the risks mapped, as well as presenting the risks under its responsibility to the Executive Risk Committee, to the Executive Office, the Board of Directors or one of its Advisory Committees, whenever necessary. It is responsible for establishing and implementing Crisis Management protocols and Business Continuity plans for the risk events under its responsibility, whenever applicable. For events with significant impacts, drills should be performed to verify the efficiency and effectiveness of Crisis Management protocols. The periodicity of the drills should be defined by the 1st line of defense according to the criticality, observing local rules and specificities of the legislation. It must meet the guidelines defined by the 2nd line of defense.
- The 2nd Line of Defense, which corresponds to the areas of occupational safety, risk management, internal controls, standardization, legal compliance and specialist areas, such as operational excellence and asset management, supervises and supports the work of the 1st line of defense, providing training and instrumentation for risk management. It must identify and monitor new and emerging risks, ensure compliance with laws, regulations, internal standards and promote continuous improvement in risk management. For specific risks, there are areas such as Environmental, Health and Safety, Corporate Integrity and Data Security, which act as the 2nd specialist line of defense, monitoring risks and controls, and ensuring compliance with external regulations, policies and internal standards.
- The 3rd Line of Defense is composed of areas with total independence from the administration, that is, the Internal Audit and Ombudsman's Office which produce, taking into account their respective areas of operation, evaluations, inspections, through the execution of control tests, risk analysis and verification of complaints, providing exempt assurance, including on the effectiveness of risk management, internal controls and compliance.

The pillar of safety and operational excellence is strategic as it is the basis for everything. Effective processes being executed by skilled people generate predictable results leading to positive impacts on our costs, on our volumes and, obviously, on the safety of people and assets.

To support the diagnosis of safety conditions, management and mitigation of risks related to Vale's tailings dams, and also to provide recommendations for strengthening the conditions of its operations, the Board of Directors created the Independent Advisory Committee for Extraordinary Advisory Security of Dams (CIAESB).

#### Tailings management system

Since 2015, when Samarco's Fundão dam collapsed in Mariana (MG), Vale's Iron Ore business, increased investments in the management of all its structures, more specifically, maintenance services, monitoring, improvement works, audits, risk analysis, revisions of the Action Plans for Emergencies of Mining Dams (PAEBM) and implementation of warning systems, among others. The Company works to ensure the physical stability and hydraulic safety of structures and ensure compliance with legal requirements, with monitoring and regular external audits.

In 2018, all of Vale's iron ore dams classified as high and medium DPA (Associated Potential Damage) have undergone periodic dam safety reviews, obtaining all Stability Condition Declarations (DCE) for their respective structures. Certain dams, that fall within the Brazilian Law 12344/2010, are required to have external audits every six months through the regular safety inspection report. In March and September 2018, audits were carried out in Vale's iron ore structures in Brazil and the respective DCEs were issued to all dams. In March 2019, there was another external audit process when all available data was reevaluated, new interpretations for calculating safety factors were considered in the analysis and a new constitutive model and more conservative resistance parameters were adopted. As a result of the stricter analysis framework, 18 of the Company's dams (tailings and others) have not received the Stability Condition Declaration.

Since the Dam I failure in Brumadinho, the frequency of monitoring of the safety variables, as well as the inspections for stability, evaluation were intensified in order to subsidize the taking of preventive and corrective actions in a timely manner in all of Vale's structures. We anticipated the implementation of the Geotechnical Monitoring Center (CMG) at the Águas Claras mine in Nova Lima (MG, Brazil), which is responsible for monitoring all upstream and some conventional dam structures 24 hours a day, seven days a week.

In order to support the management processes of iron ore dams, Vale also has two IT systems, one of which is called Geotec, specifically designed to the routine activities of our geotechnical structures, such as monitoring and maintenance, and another called GRG ("Gestão de Risco Geotécnico" - Geotechnical Risk Management) where technical information, such as the Dam Safety Plans, are stored.

In the Coal business (Mozambique), the risk is managed by a regular geotechnical monitoring, visual inspection, maintenance plan and safety external evaluation.

The Base Metals business employs a combination of industry-leading guidelines to guide our management systems for Tailings Storage Facilities (TSFs). In every location of the world in which we operate we respect and comply with the relevant legislation. We also manage our facilities by adopting the leading technical guidance by the Canadian Dam Association Guidelines in conjunction with the leading protocols established by the Mining Association of Canada Guidelines for managing TSFs.

In addition to internal and external assessments and reviews, we reinforce our governance with the use of Independent Tailings Review Boards (TRB). The TRB process is an independent oversight body of industry-leading tailings dam practitioners who are engaged by Vale to provide guidance and oversight to all critical active and inactive facilities plus facilities in design. The TRB process was initiated in Sudbury in 2003 and now extends across global facilities that meet at least annually at each site and also provides necessary ongoing support throughout each year.

**b) Confirm whether your approach to tailings management has changed or will change in light of the recent tailings disasters at Brumadinho, Mariana, Mt Polley and others. Have you, for example, reviewed all tailings storage facilities with upstream dam construction, and taken steps necessary to protect local communities and the environment e.g. buttressing, evacuation?**

Right after Samarco's (a joint venture equally owned by Vale S.A. and BHP Billiton Brasil Ltda.) dam breach, Vale decided, in 2016, to decommission all upstream dams dedicated to iron ore in Brazil. Over the past few years, the Company turned all of them inactive, halted disposing tailings at those dams and planned their decommissioning, while securing all necessary related stability reports issued by specialized and independent companies. With the breach of the Brumadinho dam, Vale decided to accelerate the already planned decommissioning process of the remaining iron ore upstream dams and has already provisioned US\$ 1.855 billion related to this process.

The Board of Directors decided to create an Independent Advisory Committee for Extraordinary Advisory Safety of Dams (CIAESB) on January 27, 2019, which is dedicated to advising the Board of Directors in matters related to the diagnosis of the safety conditions, management and mitigation of the risks related to Vale's ore tailings dams, as well as to recommend measures to be taken to reinforce their safety conditions.

Vale has increased substantially its expenditures in dam management and has gone through several process and governance changes in order to improve the safety of our geotechnical structures. The Company is also continuing to examine additional opportunities for further improvements, as detailed below.

The investments in dam management in Brazil have been steadily strengthened. From 2016 to 2019, investments in dam management will total R\$ 786 million (approximately US\$ 220 million), being applied to initiatives related to the maintenance and safety of dams, such as maintenance services, monitoring, improvements, auditing, risk analysis, revisions of the Emergency Action Plan for Mining Dams (PAEBM), implementation of alert systems, video monitoring systems, radars, installation of geophones in structures for microsymmetric monitoring, satellite tracking systems, drones for visual monitoring of the massif, the bottom drain and the spillways. Additional new piezometers and inclinometers are also being purchased, which will contribute to increase the safety level of the dams.

**Investments in dam management**

<i>R\$ million</i>	2014	2015	2016	2017	2018	2019 <sup>1</sup>
Dam management	111	92	109	180	241	256

1. Approved amount in the Company's business plan for 2019.

With the continuous increase of the share of dry processing production, from 45% in 2014 to 60% in 2018 and 70% by 2023, the Company's investments in new dams and dam raisings tend to be concomitantly reduced. Furthermore, in order to treat the tailings from wet processing, Vale plans to invest, starting in 2020, approximately R\$ 1.5 billion (about US\$ 390 million) in the implementation of dry stacking disposal technology. This initiative goes along with the acquisition of New Steel announced in December, 2018, with innovative technologies for the dry beneficiation of iron ore.

Vale has invested nearly R\$ 66 billion (US\$ 17.5 billion) installing and expanding the use of dry processing, using natural moisture, in iron ore production in its operations in Brazil over the last 10 years. By not using water in the process, no tailings are generated and, therefore, there is no need for dams at such facilities. Over the next five years, it is estimated that an additional R\$ 11 billion (US\$ 2.5 billion) in similar processing facilities will be spent. Today, about 60% of Vale's production is dry processed and the goal is to reach 70%.

At the end of February, the Geotechnical Monitoring Center was launched. The Center currently collects data available from all upstream and some conventional dam structures, with plans to expand to all geotechnical structures in Brazil. There are professionals monitoring information 24 hours a day, 7 days a week, to ensure an informed, fast and secure decision-making process. The Center intends to provide redundancy to the existing process of identification of risks and anomalies by the risk owners at the dam site.

In the Coal business, the Company is increasing its safety levels, with more frequent visual inspections, automation of geotechnical monitoring and a review of the emergency plan including alert system downstream.

In the Base Metals business, each structure built using the upstream method has undergone an extensive physical inspection as well as an independent audit of those inspection processes. Benchmarking of internal and external technologies available for monitoring have been undertaken and a suite of projects have been initiated including automation of all instruments as well as satellite monitoring trials.

In addition to all of the abovementioned initiatives, a Safety and Operational Excellence Office was created and will act in the areas of Safety, Operational Risk, Asset Management and Operational Excellence. This structure will keep a direct reporting channel open concerning operational risk management to the CEO and to the Board of Directors. It will be composed of highly qualified professionals who will act independently, thus strengthening and unifying the second line of defense for operational risks.

### Relocations

The communities impacted by the rupture of the Dam I or the residents of the Self-Rescue Zones ("ZAS – Zonas de Auto-Salvamento") of the Sul Superior, B3/B4, Vargem Grande, Forquilhas I, II, III and Grupo dams were evacuated:

- Brumadinho: 329 people relocated in temporary housing, hotels, inns or the houses of friends and relatives;
- Barão de Cocais (Sul Superior dam of the Gongo Soco mine): 458 people relocated in temporary dwellings, hotels, inns or the house of friends and relatives;

- Macacos (dam B3/B4 of the Mar Azul mine): 318 people in hotels and inns;
- Nova Lima (Vargem Grande dam at the Vargem Grande mine): 49 people in hotels;
- Ouro Preto (Forquilha I, II and III dams and Fábrica complex): 4 people in a guesthouse.
- Rio Preto (water dam of Pequena Central Hidrelétrica (PCH) Mello): 26 people in familiar or rented houses.

Vale continues to work together with public authorities to provide clarifications to the affected communities, carrying out emergency drills to reinforce guidelines and train the population living in the Self-Rescue Zones and Secondary Safety Zone on how to proceed in case of an emergency.



## **Annex B – Joint Ventures**

In the Non-Operated Joint Ventures (“NOJVs”) MRN and Samarco, Vale exercises its governance by the appointment of members to their Board of Directors, who are supported by shareholders representatives in Technical Committees and Subcommittees. Part of the scope of those committees are the oversight of tailings and risk management. All Vale’s representatives on the NOJVs’ Board of Directors, Committees and Sub-Committees are required to act in compliance with Vale and NOJVs norms and policies. Both MRN and Samarco have independent management teams.



**Annex C** – Please refer to table attached.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Fernandinho</b>	Abóboras, Nova Lima, Minas Gerais, Brazil -43.859515 : -20.18332(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	2006	Yes	Upstream	19.00	1.02	1.02	Mar-19	No	Low	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 17. According to Brazilian ordinance it is not an obligation because it is classified as low DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: Structure is under Dam Safety Review as requested by the Public Prosecutors.	
<b>Vargem Grande</b>	Abóboras, Nova Lima, Minas Gerais, Brazil -43.867009 : -20.181878(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	2001	Yes	Upstream	35.00	9.50	9.50	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 15. In 2012 and 2019 it didn't receive DCE (Stability Condition Statement) (Source: 2012 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's Press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Diogo</b>	Água Limpa, Rio Piracicaba, Minas Gerais, Brazil -43.196194 : -19.929942(SIRGAS 2000)	Owned and operated	Active	1993	Yes	Downstream	39.00	6.57	9.57	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' is not complete, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2009 and 2011 it didn't receive DCE (Stability Condition Statement) (Source: BDA (FEAM - State Agency of Minas Gerais Data System)) however, currently, it has a positive DCE. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>5 - MAC System</b>	Águas Claras, Nova Lima, Minas Gerais, Brazil -43.893003 : -19.977087(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1989	Yes	Downstream	78.00	13.72	13.72	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	1. There is one internal dike 4. Inactive - no longer receiving tailings and received a negative DCE (Stability Condition Statement) in 2019. 15. In 2012 it didn't receive a DCE (Stability Condition Statement). In 2019 it also didn't receive a DCE due to the internal dike (Source: 2012 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release).

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Campo Grande</b>	Alegria, Mariana, Minas Gerais, Brazil -43.487317 : -20.176068(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1998	Yes	Centerline	99.30	22.98	22.98	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes. No.	Yes	4. Inactive - temporarily inactive due to a negative DCE (Stability Condition Statement) in 2019. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive Project', therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2019 it didn't receive a DCE (Source: 2019 - SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Norte/Laranjeiras</b>	Brucutu, Barão de Cocais, Minas Gerais, Brazil -43.421438 : -19.847915(SIRGAS 2000)	Owned and operated	Active	2016	Yes	Single Step	58.80	16.55	50.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Sul (Córrego do Canal)</b>	Brucutu, São Gonçalo do Rio Abaixo, Minas Gerais, Brazil -43.38568 : -19.883975(SIRGAS 2000)	Owned and operated	Active	1999	Yes	Downstream	83.00	53.74	63.74	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	15. In 2009 it didn't receive DCE (Stability Condition Statement) (Source: BDA (FEAM - State Agency of Minas Gerais Data System)) but currently it has a positive DCE. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecution.
<b>Torto</b>	Brucutu, São Gonçalo do Rio Abaixo, Minas Gerais, Brazil -43.413685 : -19.851575(SIRGAS 2000)	Owned and operated	Construction	Construction	Construction	Single Step	Construction	Construction	16.00	Construction	Construction	Construction	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Construction	Both	Construction	Yes. Yes.	Yes	-
<b>Peneirinha</b>	Capitão do Mato, Nova Lima, Minas Gerais, Brazil -43.963614 : -20.110615(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	No historical information (Before Vale)	Yes	Single Step	40.00	0.43	0.43	Mar-19	No	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2018	Yes. Yes.	Yes	4. Inactive - no longer receiving tailings. 5. There is no record information and it wasn't owned by Vale when it started. Vale is working in the 'As Is' project. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale will work in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 15. In 2008, 2012, 2013 and 2014 it didn't receive DCE (Stability Condition Statement) (Source: BDA (FEAM - State Agency of Minas Gerais Data System)) and currently it has a positive DCE. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Pontal System</b>	Cauê, Itabira, Minas Gerais, Brazil -43.182944 : -19.625463(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1972	Yes	Downstream	69.00	226.96	226.96	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	1. There are 6 internal dikes. 4. Inactive - It is temporarily inactive because of a negative DCE (Stability Condition Statement) in 2019. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive Project', therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. 15. In 2019 it didn't receive a DCE due to Dike 2 (Source: 2019 - SIGBM (ANM) as per Vale's press Release). 20. Relevant Information: Structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Conceição</b>	Conceição, Itabira, Minas Gerais, Brazil -43.274146 : -19.647591(SIRGAS 2000)	Owned and operated	Active	1977	Yes	Downstream	60.00	38.06	41.06	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 15. In 2009, 2010 and 2011 it didn't receive DCE (Stability Condition Statement) for Dique 1A (internal dike), that was part of the structure but it doesn't exist anymore (Source: BDA (FEAM - State Agency of Minas Gerais Data System). Currently it has a positive DCE (Stability Condition Statement). 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Itabiruçu</b>	Conceição, Itabira, Minas Gerais, Brazil -43.286226 : -19.685378(SIRGAS 2000)	Owned and operated	Active	1981	Yes	Downstream	71.00	131.70	196.20	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Rio do Peixe System</b>	Conceição, Itabira, Minas Gerais, Brazil -43.23642 : -19.674226(SIRGAS 2000)	Owned and operated	Active	1977	Yes	Single Step	31.00	13.80	13.80	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes.	Yes	1. There is 1 internal dike. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive Project', therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
VI	Córrego do Feijão, Brumadinho, Minas Gerais, Brazil -44.119671 : -20.104298(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1998	Yes	Single Step	40.00	0.70	0.70	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes. No.	Yes	4. Inactive - no longer receiving tailings and received a negative DCE (Stability Condition Statement) in 2019. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM we will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2019 it didn't receive DCE (Source: SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
Galego	Córrego do Meio, Sabará, Minas Gerais, Brazil -43.804528 : -19.857202(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1992	Yes	Downstream	37.28	1.26	1.26	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
Forquilha I	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.855737 : -20.406063(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1978	Yes	Upstream	98.28	12.04	12.04	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2018	Yes. No.	Yes	4. Inactive - no longer receiving tailings 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that we are missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2012 and 2019 it didn't receive DCE (Source: 2012 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
Forquilha II	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.851811 : -20.408278(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1988	Yes	Upstream	88.00	20.86	20.86	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2018	Yes. No.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 15. In 2012 and 2019 it didn't receive DCE (Source: 2012 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Forquilha III</b>	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.83663 : -20.410942(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	2000	Yes	Upstream	77.00	23.14	23.14	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2018	Yes.	Yes	4. Inactive - no longer receiving tailings; 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive Project', therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2010, 2011, 2012, 2014, 2015 and 2019 it didn't receive DCEs (Source: 2010, 2011, 2012, 2014 and 2015 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release); 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Grupo</b>	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.865151 : -20.414798(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1971	Yes	Upstream	43.00	0.80	0.80	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	No	Yes. No.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 15. In 2009, 2010, 2012, 2013, 2014, 2015 and 2019 it didn't receive DCEs (Source: 2009, 2010, 2012,2013, 2014 and 2015 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release). 17. This structure was classified as high DPA (Associated Potential Damage) in June 2018, therefore the PAEBM (Emergency Plan) will be ready in June 2019 in accordance to the DNPM (National Department of Mineral Production) ordinance. 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Forquilha IV</b>	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.851556 : -20.394796(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	2014	Yes	Centerline	105.00	4.31	12.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	Yes, 2018	Yes. Yes.	Yes	4. Inactive - the site is temporarily inactive due to an ACP (Public Civil Action). 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Forquilha V</b>	Fábrica, Ouro Preto, Minas Gerais, Brazil -43.839693 : -20.39488(SIRGAS 2000)	Owned and operated	Commissioning	Commissioning	Yes	Single Step	98.80	0.00	3.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency),	Commissioning	Both	Yes, 2018	Yes. Yes.	Yes	20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Sul Superior</b>	Gongo Soco, Barão de Cocais, Minas Gerais, Brazil -43.596867 : -19.970176(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	No historical information (Before Vale)	Yes	Upstream	85.00	6.02	6.02	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	No.	Yes	4. Inactive - no longer receiving tailings. 5. There is no record information and it wasn't owned by Vale when it started. We are working in the 'As Is' project. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 15. In 2019 it didn't receive a DCE (Source: SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>2 Kalunga</b>	Manganês Azul, Parauapebas, Pará, Brazil -50.305265 : -6.118713(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1990	Yes	Upstream	7.50	0.72	0.72	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	No	Yes. No.	Yes	4. Inactive - no longer receiving tailings. 7. After the As Is, the structures was reclassified as upstream and this information will be in the SIGBM System. 12. Vale finished the 'As Is' project and we will change the status in the ANM's (National Mining Agency) system called SIGBM. 17. According to Brazilian ordinance it is not an obligation because it is classified as medium DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and will be no need for monitoring.
<b>3 Kalunga</b>	Manganês Azul, Parauapebas, Pará, Brazil -50.302444 : -6.120066(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1990	Yes	Upstream	3.50	1.97	1.97	Sep-18	Yes	Low	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	No	Yes. No.	Yes	4. Inactive - no longer receiving tailings. 7. After the 'As Is' project, the structure was reclassified as upstream and this information will be registered in the SIGBM System. 17. According to Brazilian ordinance, it is not an obligation because it is classified as low DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring.
<b>Azul</b>	Manganês Azul, Parauapebas, Pará, Brazil -50.291473 : -6.078161(SIRGAS 2000)	Owned and operated	Active	1996	Yes	Downstream	32.00	13.00	13.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	No	Yes. Yes.	Yes	17. This structure was classified as high DPA (Associated Potential Damage) in June 2018, therefore the PAEBM (Emergency Plan) will be ready in June 2019 in accordance to Brazilian ordinance.
<b>Kalunga</b>	Manganês Azul, Parauapebas, Pará, Brazil -50.308309 : -6.112529(SIRGAS 2000)	Owned and operated	Active	1987	Yes	Downstream	21.00	1.66	1.66	Mar-19	No	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	No	Yes. Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)) 17. According to Brazilian ordinance, it is not an obligation because it is classified as medium DPA (Associated Potential Damage).

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>B3/B4</b>	Mar Azul, Nova Lima, Minas Gerais, Brazil -43.954696 : -20.049122(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	No historical information (Before Vale)	Yes	Upstream	55.00	2.70	2.70	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	No.	Yes	4. Inactive - no longer receiving tailings. 5. There is no record information and it wasn't owned by Vale when it started. Vale is working in the 'As Is' project. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 15. In 2010 and 2019 it didn't receive DCEs (Source: 2010 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>5 - Mutuca</b>	Mutuca, Nova Lima, Minas Gerais, Brazil -43.942562 : -20.026226(SIRGAS 2000)	Owned and operated	Active	1989	Yes	Downstream	55.00	11.00	11.00	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 15. In 2012 it didn't receive DCE (Stability Condition Statement) (Source: 2012 - BDA (FEAM - State Agency of Minas Gerais Data System)) and currently it has a positive DCE.
<b>Maravilhas II</b>	Pico, Itabirito, Minas Gerais, Brazil -43.891707 : -20.214436(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1996	Yes	Downstream	97.92	94.98	100.00	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	4. Inactive - temporarily inactive due to a negative DCE (Stability Condition Statement) in 2019. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)). 15. In 2019 it didn't receive DCE (2019 - SIGBM (ANM) as per Vale's press Release). 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Maravilhas I</b>	Pico, Itabirito, Minas Gerais, Brazil -43.873226 : -20.224925(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1987	Yes	Downstream	12.00	2.71	2.71	Mar-19	No	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes.	Yes	4. Inactive - no longer receiving tailings. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 15. In 2009, 2010, 2011 and 2014 it didn't receive DCEs (Stability Condition Statement). (Source: 2009, 2010, 2011 and 2014 - BDA (FEAM - State Agency of Minas Gerais Data System)) and currently it has a positive DCE. 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Maravilhas III</b>	Pico, Itabirito, Minas Gerais, Brazil -43.908509 : -20.220594(SIRGAS 2000)	Owned and operated	Construction																
<b>Gregório</b>	Santa Cruz, Corumbá, Mato Grosso do Sul, Brazil -57.559979 : -19.224447(SIRGAS 2000)	Owned and operated	Active	1992	Yes	Centerline	34.50	8.99	9.30	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. No.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 18. The closure plan consists of decharacterization and there will be no need for monitoring.
<b>Geladinho</b>	Serra Norte, Parauapebas, Pará, Brazil -50.109482 : -5.994793(SIRGAS 2000)	Owned and operated	Active	1990	Yes	Single Step	24.00	5.81	5.81	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)).
<b>Gelado</b>	Serra Norte, Parauapebas, Pará, Brazil -50.141444 : -5.979277(SIRGAS 2000)	Owned and operated	Active	1985	Yes	Downstream	34.00	110.47	116.15	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the As Is project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)).
<b>Doutor</b>	Timbopeba, Ouro Preto, Minas Gerais, Brazil -43.490528 : -20.290449(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	2001	Yes	Centerline	77.00	37.68	48.18	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes, 2016 and 2018	Yes. No.	Yes	4. Inactive - temporarily inactive because of negative DCE (Stability Condition Statement) in 2019. 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that it is missing either the 'As Built' or 'Executive' Project, because the existing 'As Built' project is not complete, therefore Vale is working in the As Is project in accordance to the DNPM (National Department of Mineral Production) Ordinance. 15. In 2011 and 2019 it didn't receive DCEs (Source: 2011 - BDA (FEAM - State Agency of Minas Gerais Data System) and 2019 - SIGBM (ANM) as per Vale's press Release). 18. The closure plan consists of decharacterization and there will be no need for monitoring. 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.
<b>Timbopeba</b>	Timbopeba, Ouro Preto, Minas Gerais, Brazil -43.496235 : -20.270514(SIRGAS 2000)	Owned and operated	Inactive/Care and Maintenance	1982	Yes	Single Step	64.90	34.00	34.00	Mar-19	No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes, 2016 and 2018	Yes. Yes.	Yes	4. Inactive - temporarily negative because of ACP (Civil Public Action); 12. In the ANM's System (Brazilian National Mining Agency) called SIGBM there is the information that it is missing either the 'As Built' or 'Executive' Project, therefore Vale is working in the 'As Is' project in accordance to the DNPM (National Department of Mineral Production) Ordinance. (Source: SIGBM (ANM)); 20. Relevant Information: The structure is under Dam Safety Review as requested by the Public Prosecutors.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
Bacia 02 Pé da Serra	Urucum, Corumbá, Mato Grosso do Sul, Brazil -57.636445 : -19.171285(SIRGAS 2000)	Owned and operated	Active	2007	Yes	Single Step	4.25	0.03	0.03	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	No	Yes. No.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that we have all the information of the dam. 17. According to Brazilian ordinance it is not an obligation because it is classified as medium DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring.
Bacia 03-04 Pé da Serra	Urucum, Corumbá, Mato Grosso do Sul, Brazil -57.639508 : -19.174031(SIRGAS 2000)	Owned and operated	Active	2007	Yes	Single Step	4.20	0.08	0.08	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	No	Yes. No.	Yes	12. In the ANM's System (Brazilian National Mining Agency) called SIGBM Vale will inform that we have all the information of the dam. 17. According to Brazilian ordinance it is not an obligation because it is classified as medium DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring.
Bacia 02-03 Alto da Serra Mn	Urucum, Corumbá, Mato Grosso do Sul, Brazil -57.616698 : -19.190809(SIRGAS 2000)	Owned and operated	Active	1987	Yes	Single Step	10.07	0.01	0.01	Sep-18	Yes	Low	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	No	Yes. No.	Yes	17. According to Brazilian ordinance it is not obligation because it is classified as low DPA (Associated Potential Damage) 18. The closure plan consists of decharacterization and there will be no need for monitoring.
Bacia 05 Alto da Serra	Urucum, Corumbá, Mato Grosso do Sul, Brazil -57.613781 : -19.19184(SIRGAS 2000)	Owned and operated	Active	1987	Yes	Single Step	11.69	0.01	0.01	Sep-18	Yes	Low	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	No	Yes. No.	Yes	17. According to Brazilian ordinance it is not an obligation because it is classified as low DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring.
Bacia 07 Alto da Serra	Urucum, Corumbá, Mato Grosso do Sul, Brazil -57.614591 : -19.192036(SIRGAS 2000)	Owned and operated	Active	1987	Yes	Single Step	13.05	0.01	0.01	Sep-18	Yes	Low	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	No	Yes. No.	Yes	17. According to Brazilian ordinance it is not obligation because it is classified as low DPA (Associated Potential Damage). 18. The closure plan consists of decharacterization and there will be no need for monitoring.
TSF-01	Tete, Mozambique 16° 10' 00" - 33° 46' 00"	Owned and operated	Active	2011	Yes	Downstream	29.00	18.00	23.00	Mar-19	Yes	Low	Specific Mozambican law - Decreto 50-2017	No	No. Yes.	Yes, 2017	Yes. No.	Yes	16. We have 2 umbrella contracts (Golder Associates Africa and SRK Consultant) to support. 18. The closure plan for TSF 01 is in conceptual phase. There is a plan to re-mining the tailings disposed in the dam, that drives the closure plan on the future.
Barragem de Rejeitos do Sossego	Sossego, Canaã dos Carajás, Pará, Brazil 6°26'02.3"S 50°04'49.0"W	Owned and operated	Active	2002	Yes	Centerline	42.00	110.00	154.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	Yes, 2018	Yes. Yes.	Yes	-

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Pondes de Rejeitos</b>	Igarapé Bahia, Parauapebas, Pará, Brazil 6°01'44.3"S 50°34'48.3"W	Owned and operated	Inactive/Care and Maintenance	1989	Yes	Downstream	25.00	12.00	12.00	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency),	Yes	Both	Yes, 2018	Yes.	Yes	15. This facility has been inactive since 2002. This facility failed to meet appropriate Brazilian Dam Safety Standards following the change in legislation in June 2017 due to not having a spillway. We are in the process of preparing for closure of this facility in accordance with relevant legislation that will rectify this deficiency.
<b>Barragem de Rejeito do Mirim</b>	Salobo, Marabá, Pará, Brazil 5°35'32.5"S 50°10'59.8"W	Owned and operated	Active	2012	Yes	Downstream	63.00	95.00	218.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency),	No	Both	Yes, 2018	Yes.	Yes	-
<b>KO2 Berm</b>	Noumea, New Caledonia 22°18'30.7"S 166°55'06.3"E	Owned and operated	Active	2008	Yes	Downstream	65.00	22.00	40.00	Dec-18	Yes	Class A	New Caledonia Decree #2015-526	No	Both	Yes, 2019	Yes.	Yes	-
<b>Voisey's Bay TSF</b>	Voisey's Bay, Labrador, Canada 56°19'22.8"N 61°59'10.8"W	Owned and operated	Active	2005	Yes	Single step	11.00	20.10	28.00	Sep-18	Yes	Very high	Canadian Dam Association	No	Both	No	Yes.	Yes	1. This TSF is comprised of 2 dams. 17. Based on an assessment, no detailed inundation study was required at this time.
<b>Long Harbour Residue Storage Facility</b>	Long Harbour, Newfoundland, Canada 47°24'47.7"N 53°48'44.1"W	Owned and operated	Active	2013	Yes	Single step	10.00	0.93	2.47	Sep-18	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2008	Yes.	Yes	1. This TSF is comprised of 3 dams
<b>FETA Dam</b>	Sudbury, Ontario, Canada 46°30'57.1"N 81°01'29.3"W	Owned and operated	Inactive/Care and Maintenance	1968	Yes	Single Step	12.00	5.10	5.10	Apr-19	Yes	Low	Canadian Dam Association	No	Both	Yes, 2019	Yes.	Yes	-
<b>Levack TSF</b>	Onaping, Ontario, Canada 46°39'52.0"N 81°22'40.3"W	Owned and operated	Inactive/Care and Maintenance	1957	Yes	Downstream	16.00	8.60	8.60	Apr-19	Yes	Significant	Canadian Dam Association	No	Both	Yes, 2011	Yes.	Yes	1. This TSF is comprised of 5 dams
<b>Shebandowan TSF</b>	Shebandowan, Ontario, Canada 48°34'46.1"N 90°12'58.7"W	Owned and operated	Inactive/Care and Maintenance	1971	Yes	Downstream	10.00	4.30	4.30	Apr-19	Yes	Very High	Canadian Dam Association	No	Both	Yes, 2019	Yes.	Yes	1. This TSF is comprised of 6 dams
<b>Thompson TSF Dam A<sup>1</sup></b>	Thompson, Manitoba, Canada 55°42'14.5"N 97°48'18.2"W	Owned and operated	Active	1971	Yes	Downstream	26.00	42.00	47.00	Sep-18	Yes	Significant	Canadian Dam Association	Yes	Both	Yes, 2017	Yes.	Yes	1. This TSF is a single dam 13. Hazard classification is based on low economic losses affecting limited infrastructure and not the Loss of Life or Environmental and Cultural Values 15. Based on internal and external investigations, known zones in the dam foundation are under further analysis and we are undertaking additional assessment and precautions while the investigation is ongoing with the oversight of the TRB (Tailings Review Board).

1. Thompson TSF Dam A and Thompson TSF Other Dams updated as of July 4, 2019.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Thompson TSF Other Dams <sup>1</sup></b>	Thompson, Manitoba, Canada 55°42'14.5"N 97°48'18.2"W	Owned and operated	Active	1971	Yes	Downstream	26.00	42.00	47.00	Sep-18	Yes	Very High	Canadian Dam Association	No	Both	Yes, 2017	Yes.	Yes	1. This TSF is comprised of 5 dams 13. Hazard classification is based on Environment & Cultural Values and Infrastructure & Economics; not loss of life classification.
<b>Upper Pond Tailings Facility</b>	Copper Cliff, Ontario, Canada 46°29'10.7"N 81°03'03.0"W	Owned and operated	Inactive/Care and Maintenance	1929	Yes	Upstream	19.00	3.90	3.90	May-19	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2017	Yes.	Yes	1. This TSF is comprised of 2 dams
<b>A Area Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Inactive/Care and Maintenance	1936	Yes	Upstream	25.00	8.40	8.40	May-19	Yes	Extreme	Canadian Dam Association	No	Both	No	Yes.	Yes	17. With the oversight of the TRB (Tailings Review Board), a formal specific analysis has not been undertaken, as the risk and consequences for A Area are included within the assessment of the M Area Inundation Assessment
<b>M Area Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Inactive/Care and Maintenance	1945	Yes	Upstream	37.00	58.60	58.60	May-19	Yes	Extreme	Canadian Dam Association	Yes	Both	Yes, 2003	Yes.	Yes	1. This TSF is comprised of 2 dams 15. Following internal and external analysis plus the oversight of the TRB (Tailings Review Board), we are in the process of buttressing and stabilizing M Area dams due to known layers of fine tailings in the dam shell.
<b>P Area Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Inactive/Care and Maintenance	1960	Yes	Upstream	45.00	59.70	59.70	May-19	Yes	Extreme	Canadian Dam Association	Yes	Both	Yes, 2006	Yes.	Yes	1. This TSF is comprised of 6 dams 15. Following internal and external analysis plus the oversight of the TRB (Tailings Review Board), we are in the process of buttressing and stabilizing P Area dams due to known layers of fine tailings in the dam shell.
<b>R1 Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Active	1985	Yes	Compacted Outer Shell	14.00	2.90	4.00	May-19	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2018	Yes.	Yes	1. This TSF is comprised of 1 dam. 7. The R Area Dams have been constructed using the compacted outer shell (COS) method. They have been built in the upstream direction but not using the "upstream method". Unlike the traditional upstream method of construction, the COS method dams have an extensive underdrainage system to drain the shell, the deposited tailings is coarse in nature, and the dam shell receives extensive
<b>R2 Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Active	1985	Yes	Compacted Outer Shell	13.00	18.00	18.00	May-19	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2018	Yes.	Yes	1. This TSF is comprised of 6 dams 7. The R Area Dams have been constructed using the compacted outer shell (COS) method. They have been built in the upstream direction but not using the "upstream method". Unlike the traditional upstream method of construction, the COS method dams have an extensive underdrainage system to drain the shell, the deposited tailings is coarse in nature, and the dam shell receives extensive compactive effort.
<b>R3 Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Active	1985	Yes	Compacted Outer Shell	27.00	39.00	42.00	May-19	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2018	Yes.	Yes	1. This TSF is comprised of 11 dams 7. The R Area Dams have been constructed using the compacted outer shell (COS) method. They have been built in the upstream direction but not using the "upstream method". Unlike the traditional upstream method of construction, the COS method dams have an extensive underdrainage system to drain the shell, the deposited tailings is coarse in nature, and the dam shell receives extensive
<b>R4 Tailings</b>	Copper Cliff, Ontario, Canada 46°28'17.1"N 81°08'26.1"W	Owned and operated	Active	1990	Yes	Compacted Outer Shell	22.00	59.00	63.00	May-19	Yes	Extreme	Canadian Dam Association	No	Both	Yes, 2018	Yes.	Yes	1. This TSF is comprised of 13 dams 7. The R Area Dams have been constructed using the compacted outer shell (COS) method. They have been built in the upstream direction but not using the "upstream method". Unlike the traditional upstream method of construction, the COS method dams have an extensive underdrainage system to drain the shell, the deposited tailings is coarse in nature, and the dam shell receives extensive

1. Thompson TSF Dam A and Thompson TSF Other Dams updated as of July 4, 2019.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
<b>Germano Main Dam</b>	Mariana, Minas Gerais, Brazil -20.21811, -43.465195	Non-operated Joint Venture	Inactive	1977	No	Upstream	163.0	129.60	129.60	Mar-19	Operator: Yes Vale: No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Operator: Yes to Both Vale: No to both	Yes, 2017 and 2018	No. No.	Operator: Yes Vale: No	6. The dam is inactive, however it is in compliance with the currently approved design. 15. The external advisors and the ITRB (Independent Technical Review Board) have consistently confirmed the stability of the dams in Operator's tailing system. After the Mariana incident emergency works were performed in order to ensure the stability required and be in compliance with the applicable regulation. 18. Operator is developing a closure plan and long-term monitoring will be defined as part of the decommissioning process.
<b>Germano Pit Dam</b>	Mariana, Minas Gerais, Brazil -20.193637, -43.491281	Non-operated Joint Venture	Inactive	2001	No	Upstream	60.0	16.60	16.60	Mar-19	Operator: Yes Vale: No	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Operator: Yes to Both Vale: No to both	Yes, 2017 and 2018	No. No.	Operator: Yes Vale: No	6. The dam is inactive, however it is in compliance with the currently approved design. 18. Operator is developing a closure plan and long-term monitoring will be defined as part of the decommissioning process.
<b>MRN - SP-01</b>	Oriximiná, Pará, Brazil 1° 40.993'S, 56° 25.079'W	Non-operated Joint Venture	Inactive	1989	Yes	Single Step	15.0	2.36	2.90	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	6 This structure is being utilized for rehabilitation tests, however the closing/decommissioning project is still under way. 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
<b>MRN - SP-2/3</b>	Oriximiná, Pará, Brazil 1° 41.067'S, 56° 24.228'W	Non-operated Joint Venture	Inactive	1990	Yes	Single Step	17.0	6.36	7.45	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	6. This structure is being utilized for rehabilitation tests, however the closing/decommissioning project is still under way 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
MRN - SP-4N	Oriximiná, Pará, Brazil 1° 41.109'S, 56° 25.610'W	Non-operated Joint Venture	Inactive	1995	Yes	Upstream	19.0	6.96	7.60	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-4S	Oriximiná, Pará, Brazil 1° 41.489'S, 56° 25.646'W	Non-operated Joint Venture	Inactive	1995	Yes	Upstream	19.0	5.57	6.10	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-5L	Oriximiná, Pará, Brazil 1° 41.009'S, 56° 26.252'W	Non-operated Joint Venture	Inactive	1997	Yes	Upstream	19.0	6.43	7.10	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
MRN - SP-50	Oriximiná, Pará, Brazil 1° 41.079'S, 56° 26.693'W	Non-operated Joint Venture	Inactive	1997	Yes	Upstream	19.0	8.36	8.70	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-06	Oriximiná, Pará, Brazil 1° 40.648'S, 56° 25.491'W	Non-operated Joint Venture	Inactive	1999	Yes	Upstream	12.0	0.36	0.50	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-7A	Oriximiná, Pará, Brazil 1° 40.329'S, 56° 26.059'W	Non-operated Joint Venture	Inactive	2001	Yes	Upstream	19.0	3.76	4.20	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
MRN - SP-7B	Oriximiná, Pará, Brazil 1° 40.205'S, 56° 26.406'W	Non-operated Joint Venture	Inactive	2002	Yes	Upstream	17.0	6.14	6.69	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-7C	Oriximiná, Pará, Brazil 1° 40.191'S, 56° 26.704'W	Non-operated Joint Venture	Inactive	2003	Yes	Upstream	17.0	8.29	9.04	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	7. This classification is not according to information of the designer and we are in process of changing it at the mining regulatory agency (ANM). According to designer the raising method is classified as "Modified Centreline" (raising by center line with the axis moved upstream). 12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-08	Oriximiná, Pará, Brazil 1° 40.388'S, 56° 27.154'W	Non-operated Joint Venture	Active	2004	Yes	Single Step	12.0	13.21	14.74	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-09	Oriximiná, Pará, Brazil 1° 40.475'S, 56° 27.659'W	Non-operated Joint Venture	Active	2005	Yes	Single Step	16.0	8.78	11.16	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
MRN - SP-9A	Oriximiná, Pará, Brazil 1° 40.095'S, 56° 27.725'W	Non-operated Joint Venture	Active	2006	Yes	Single Step	12.0	2.17	2.44	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-10	Oriximiná, Pará, Brazil 1° 40.995'S, 56° 27.179'W	Non-operated Joint Venture	Active	2007	Yes	Single Step	16.0	7.64	8.30	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-11	Oriximiná, Pará, Brazil 1° 40.988'S, 56° 27.763'W	Non-operated Joint Venture	Active	2008	Yes	Single Step	16.0	6.97	7.80	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 13. The classification was performed by independent auditing (March, 19) and needs to be validated by the mining regulatory agency. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-12	Oriximiná, Pará, Brazil 1° 41.189'S, 56° 28.144'W	Non-operated Joint Venture	Active	2009	Yes	Single Step	15.0	5.14	6.00	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-13	Oriximiná, Pará, Brazil 1° 41.643'S, 56° 28.070'W	Non-operated Joint Venture	Active	2010	Yes	Single Step	15.0	2.11	3.20	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

1. "Tailings Dam" Name/Identifier	2. Location	3. Ownership	4. Status	5. Date of initial operation	6. Is the Dam currently operated or closed as per currently approved design?	7. Raising method	8. Current Maximum Height (Meter)	9. Current Tailings Storage Impoundment Volume (Mm3)	10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)	11. Most recent Independent Expert Review	12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	13. What is your hazard categorisation of this facility, based on consequence of failure?	14. What guideline do you follow for the classification system?	15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.
MRN - SP-14	Oriximiná, Pará, Brazil 1° 41.951'S, 56° 28.211'W	Non-operated Joint Venture	Active	2011	Yes	Single Step	15.0	3.18	3.75	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-15	Oriximiná, Pará, Brazil 1° 41.950'S, 56° 28.502'W	Non-operated Joint Venture	Active	2013	Yes	Single Step	16.0	3.89	5.90	Mar-19	Yes	Medium	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-16	Oriximiná, Pará, Brazil 1° 41.241'S, 56° 28.777'W	Non-operated Joint Venture	Active	2017	Yes	Single Step	17.0	3.49	9.50	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. June 2018	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - SP-19	Oriximiná, Pará, Brazil 1° 40.907'S, 56° 28.126'W	Non-operated Joint Venture	Active	2019	Yes	Single Step	20.0	0.73	1.72	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	No	Both	Yes. January 2019	No. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. Structure with operating criteria different from the others. A specific closing plan should be drawn up. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.
MRN - TP-01	Oriximiná, Pará, Brazil 1° 41.005'S, 56° 24.659'W	Non-operated Joint Venture	Inactive	1988	Yes	Single Step	18.0	3.48	5.00	Mar-19	Yes	High	Ordinance 70.389/17 - ANM (Mining National Agency), Brazil	Yes	Both	Yes. April 2017 (risk analysis) / June 2018 (dam break study)	Yes. No.	Yes	12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 15. A prior study raised a concern regarding a specific section within this structure - a spillway was added to address this concern, as recommended in the study. The concern no longer exists and the structure has never failed to obtain a declaration of stability as required under applicable regulations. 17. There is a Dam Break study and a risk analysis. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.

<p>1. "Tailings Dam" Name/Identifier</p> <p><b>MRN - TP-02</b></p>	<p>2. Location</p> <p>Oriximiná, Pará, Brazil 1° 40.588'S, 56° 26.272'W</p>	<p>3. Ownership</p> <p>Non-operated Joint Venture</p>	<p>4. Status</p> <p>Active</p>	<p>5. Date of initial operation</p> <p>2002</p>	<p>6. Is the Dam currently operated or closed as per currently approved design?</p> <p>Yes</p>	<p>7. Raising method</p> <p>Single Step</p>	<p>8. Current Maximum Height (Meter)</p> <p>15.0</p>	<p>9. Current Tailings Storage Impoundment Volume (Mm3)</p> <p>5.47</p>	<p>10. Planned Tailings Storage Impoundment Volume in 5 years time. (Mm3)</p> <p>8.50</p>	<p>11. Most recent Independent Expert Review</p> <p>Mar-19</p>	<p>12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.</p> <p>Yes</p>	<p>13. What is your hazard categorisation of this facility, based on consequence of failure?</p> <p>High</p>	<p>14. What guideline do you follow for the classification system?</p> <p>Ordinance 70.389/17 - ANM (Mining National Agency), Brazil</p>	<p>15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).</p> <p>No</p>	<p>16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?</p> <p>Both</p>	<p>17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?</p> <p>Yes. April 2017 (risk analysis) Yes. June 2018</p>	<p>18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?</p> <p>Yes. No.</p>	<p>19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?</p> <p>Yes</p>	<p>20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.</p> <p>12. The available documents are sufficient to ensure the safety of the structure, including an independent stability report. 14. The classification is done by the independent auditor. 17. There is a Dam Break study. 18. It was developed a conceptual closure plan for the entire facility. 19. The structures are being evaluated for a rainfall of 10,000 years. The project until then considered the service during the operation to a rainfall of 1,000 years of recurrence.</p>
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