

sherritt

**2019
Tailings
Management
Report**



Sherritt strives to operate and maintain its tailings management facilities in accordance with global best practices for safety. We continually review our facilities and procedures and are committed to pursuing the highest standard of safety at our operations.

The Moa Nickel Site is operated by the Moa Joint Venture's management, reporting to the Moa Joint Venture Board of Directors. The Moa Joint Venture is a 50/50 joint venture between Sherritt and a Cuban government agency. Accordingly, while the following reflects Sherritt's approach to tailings management, Sherritt itself cannot control outcomes in relation to Moa Nickel Site tailings management.

1. Management Approach

Risk Management

Dam failure is the greatest risk for our tailings management facilities (TMFs), located at the Moa Nickel Site and part of our Moa Joint Venture. Sherritt's dam safety assurance program assesses the Moa Joint Venture's tailings in line with international leading practice.

Sherritt's assets are required to assess natural phenomena such as extreme flooding and seismic events, as well as operational criteria, and incorporate these factors into their TMF designs.

There are at least six levels of governance and assurance that Sherritt advocates its assets undertake on TMFs:

1. **Regular surveillance** – Operations are expected to monitor their TMFs on an ongoing basis using piezometers, inclinometers, pressure gauges, remote sensing and other technologies to monitor tailings dams, abutments, natural slopes and water levels. The results are assessed by the management team of the operation.
2. **Annual dam safety inspections (DSI)** – Formal dam safety inspections are conducted annually by an external Engineer of Record for operating assets. A DSI evaluates and observes potential deficiencies in a TMF's current and past condition, performance and operation. DSI findings are overseen by the operation's management team.
3. **Dam safety audits** – Knight Piésold, one of the world's leading experts, audits the integrity and safety of our TMFs. The results of these audits are reported to the Moa Joint Venture management and Board of Directors, Sherritt's senior management and the EHS&S Committee of Sherritt's Board of Directors. Findings are followed up through regular independent verification audits.
4. **Independent tailings review boards** – The Moa Nickel Site has a Tailings Review Board made up of independent experts who conduct annual third-party reviews of design, operation, surveillance and maintenance.
5. **Internal governance reviews** – Sherritt's COO conducts internal management reviews of Sherritt's tailings facilities on a regular basis. Summaries are reported to the EHS&S Committee of Sherritt's Board of Directors.
6. **Staff inspections** – Tailings storage facilities are inspected by trained operators and expert technical staff as frequently as several times daily, with formal staff inspections occurring at the Moa Nickel Site at least once a month.

The different levels of assurance are undertaken on the basis of national regulations, as well as, where appropriate, criteria aligned with international guidelines from the Canadian Dam Association and the International Commission on Large Dams.

In addition, where appropriate, the Moa Nickel Site conducts periodic dam safety reviews, which include reviewing maintenance, surveillance and monitoring, failure impact assessments, emergency management procedures, public safety and environmental management. The results are shared with the operation's management and reviewed as part of the dam safety audits.

Tailings Management Standard

Sherritt has had an internal tailings management standard in place since 2018. Management at the Moa Nickel Site has adopted this standard and is in the process of implementing it. The standard aligns with the Mining Association of Canada's [Towards Sustainable Mining Tailings Management Protocol](#), and supports Sherritt's goal of designing, constructing, operating, decommissioning and closing tailings

facilities in such a manner that all structures are stable, all solids and water are managed within designated areas, and all management practices conform with regulatory requirements, sound engineering principles and good practice. Sherritt continues to review and evaluate monitoring systems and risk assessments to ensure the approach is robust and current.

Engaging with Communities

Sherritt advocates that its assets undertake proactive stakeholder and community engagement across a broad range of operational topics, including TMFs where appropriate.

We require our assets, and those of our joint ventures and subsidiaries, to develop and maintain emergency preparedness and response plans, and to communicate these plans with relevant stakeholders. Where appropriate, operations may also engage with local and regional emergency response services in scenario planning and practice exercises.

Continuous Improvement

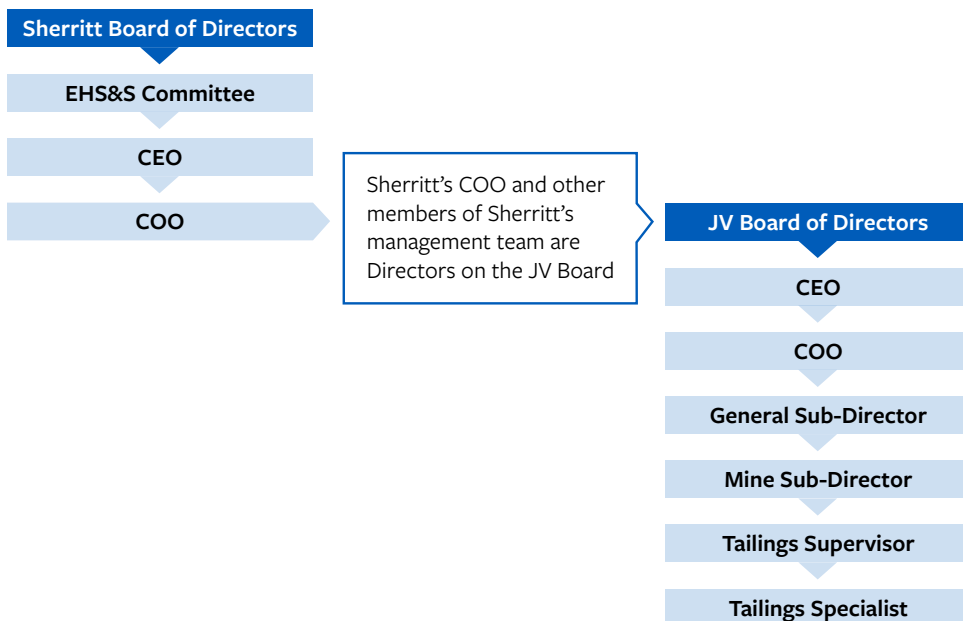
Sherritt is committed to continually reviewing its joint venture facilities and procedures to maintain the highest standard of safety at its operations. Following the tailings failure at Vale’s Feijão Mine in Brazil, Sherritt initiated a special review of its tailings facilities and procedures.

Sherritt also works in partnership with local, national and international organizations to support improvements in tailings management across the industry, including the Mining Association of Canada (MAC), a national association that promotes the development of Canada’s mining and mineral processing industry. With the assistance of MAC, Sherritt is implementing the Towards Sustainable Mining (TSM) program in wholly owned operations and working with our partners to implement it in joint ventures, which aids in improving industry performance.

2. Tailings Management Facilities

There are several TMFs at Sherritt’s Joint Venture operation in Cuba – the Moa Nickel Site. The facility is operated by the Joint Venture’s management, reporting to the Joint Venture Board of Directors. A geotechnical engineer is employed to provide oversight of design, construction and operation of the tailings facilities. Third-party engineering firms are utilized in the design and monitoring of tailings facilities. The design and operation of existing facilities meet or exceed all applicable regulatory requirements.

Tailings Management Structure



The mandate of Sherritt's EHS&S Committee, which can be found [here](#), includes the following:

- (k) ensure adequate and effective tailings management systems are in place and utilized and compliance is monitored, (including through external verification on such periodic basis as the Committee considers to be appropriate), and offer advice and/or recommendations to the Board in connection herewith.

At the Moa Nickel Site in Cuba, upstream and downstream designs have been used throughout the mine life. Stability is monitored as per the operating practices manual. Based on internal and third-party reviews of structural integrity and management systems, the facilities are operating to design specifications and are stable.

Sherritt works with its Cuban partner, the General Nickel Company S.A. of Cuba (GNC), to continually improve tailings management and achieve alignment with international best practices, including the Mining Association of Canada's Tailings Management Protocol. As a member of the Mining Association of Canada, Sherritt has influenced its partner to begin implementing Sherritt's Tailings Management Standard, which is aligned with MAC's Tailings Management Protocol, at the Moa Nickel Site in Cuba.

As well, a rehabilitation plan has been developed at the Moa Nickel Site and is underway in a section that is no longer active.

Sherritt and its Joint Venture partner also began investigating options for tailings management so that we can continue to support mining operations in Moa in 2022 and beyond. Throughout this process, Sherritt will strive to minimize environmental impacts and meet international good-practice standards in tailings management.

There are no tailings produced at the Fort Site or Oil & Gas and Power (OGP) sites.

3. Performance

The tailings management facilities at the Moa Nickel Site are reviewed regularly, both internally and by third parties, for structural integrity and the effectiveness of management systems, and all recommendations are reviewed by Moa Nickel Site management and plans are developed to address them. There have been no incidents at the tailings management facilities. Sherritt management continues to work with its joint venture partners to ensure employees have the skills required to manage the facilities effectively.

In 2019, the annual Independent Tailings Review Board recommended that the consequence classification for two TMFs be changed to extreme, in line with the other TMFs. It also identified some concerns with the foundation of the North Extension TMF. Moa Nickel Site management has started to action the recommendations, all of which are targeted for completion in 2020.

In 2019, the Moa Nickel Site also completed a self-assessment against MAC's Towards Sustainable Mining Tailings Management Protocol and assessed itself at level B. This means that some actions are not consistent or documented and also that systems/processes are planned and being developed. The self-assessment identified some management system gaps, including the need to update the Operations Maintenance and Surveillance (OMS) manual and Emergency Preparedness Plan (EPP).

Long-Term Tailings Disposal

Conceptual studies of future tailings disposal sites were completed by Knight Piésold (KP) in the past year. As shown in Figure 1 below, a proposed sequence of tailings projects has been developed that will allow tailings disposal as follows:

- The North Extension – 2019 through 2022
- Area 22, Stage 3 – late 2022 through late 2024
- Reject Valley – mid-2024 through 2029
- Los Lirios – 2029, for up to 12 years

Figure 1: Proposed Sequence of Tailings Management Facility Development at the Moa Nickel Site

Project	2019	2020	2021	2022	2023
Closure of ALTF		Closure Construction		Closure	
The North Extension		Operation			Future Stages
South Extension – Area 22, Stage 3		Construction		Operation	
Los Lirios (Initial Stage)/Reject Valley		Construction			Operation

The Acid Leach Tailings Facility (ALTF): Closure and stabilization work continued in 2019. Monitoring activities are ongoing and informing the closure plans.

The North Extension: As the ALTF approached capacity, the Moa Joint Venture retained Knight Piésold, an internationally respected engineering firm, to design an extension that would ensure continued capacity to store tailings there until 2022. In 2019, operations and staged construction began in the North Extension.

Area 22: Detailed design and permitting of this multi-phased short-term tailings solution are in progress. This project will allow for tailings storage from December 2022 to December 2024. Micro-localization, environmental impact study and permit applications are underway and the final construction permit is expected in August 2020. Construction has begun, with a completion expected in December 2021.

Los Lirios/Reject Valley: A longer-term storage option at Los Lirios and the Reject Valley are currently being designed by Knight Piésold in consultation with the JV partner. Permitting and studies are underway for both.

4. Church of England Disclosure

Sherritt is committed to being open and transparent with communities and other stakeholders regarding the construction and management of the tailings management facilities operated by the Moa Joint Venture in Cuba. Although Sherritt did not receive a letter from the Church of England requesting greater disclosure on its tailings management facilities, Sherritt understands that this is good management practice.

Below are tables that contain disclosure information requested by the Church of England, as applied to Sherritt's Joint Venture's tailings management facilities.

Table 1. Facility #1: Acid Leach Tailings Facility

Disclosure	Instructions	Response 2019	Response 2018	Comments
1. "Tailings Dam" identifier	Please identify every tailings storage facility and identify if there are multiple dams (saddle or secondary dams) within that facility. Please provide details of these within question 20	Acid Leach Tailings Facility North Extension: Extension of ALTF Area 22, Stage 3: South Extension of ALTF	Acid Leach Tailings Facility	
2. Location	Please provide longitude/latitude coordinates	700,000 E 221,000 N	700,000 E 221,000 N	
3. Ownership	Please specify: Owned and Operated, Subsidiary, JV, NOJV, as of March 2019	Moa Joint Venture	Moa Joint Venture	
4. Status	Please specify: Active, Inactive/Care and Maintenance, Closed, etc. We take "Closed" to mean: a closure plan was developed and approved by the relevant local government agency, and key stakeholders were involved in its development; a closed facility means the noted approved closure plan was fully implemented or the closure plan is in the process of being implemented. A facility that is inactive or under C&M is not considered closed until such time as a closure plan has been implemented	Acid Leach Tailings Facility: Inactive/Care and Maintenance North Extension: Operational Area 22, Stage 3: Construction Project (ongoing)	Inactive/Care and Maintenance	Final updated closure plans being completed. Closure began in 2019 and will continue to be closed in four phases for a period totalling five years
5. Date of initial operation		1979	1979	
6. Is the dam currently operated or closed, as per currently approved design?	Yes/No. If "No", more information can be provided in the answer to Q20	No	Yes	The ALTF was operated as per the design and will be closed according to the designs
7. Raising method	Note: Upstream, Centreline, Modified Centreline, Downstream, Landform, Other	Upstream	Upstream	
8. Current maximum height	Note: Please disclose in metres	40 m	40 m	
9. Current tailings storage impoundment volume	Note: (m ³ as of March 2019)	53,700,000 m ³	53,700,000 m ³	
10. Current tailings storage impoundment volume in five years' time	(m ³ as planned for January 2024)	0	0	

2019 TAILINGS MANAGEMENT REPORT

Disclosure	Instructions	Response 2019	Response 2018	Comments
11. Most recent independent expert review	(date) For this question, we take “independent” to mean a suitably qualified individual or team, external to the Operation, that does not direct the design or construction work for that facility	December 2019	September 2018	Annual independent review
12. Do you have full and complete relevant engineering records, including design, construction, operation, maintenance and/or closure?	(Yes or No) We take the word “relevant” here to mean that you have all necessary documents to make an informed and substantiated decision on the safety of the dam, be it an old facility, or an acquisition, or legacy site. More information can be provided in your answer to Q2o	Yes	Yes	All documents are stored on site
13. What is your hazard categorization of this facility, based on consequence of failure?		Extreme	Significant	Change in consequence categorization recommended by the ITRB in 2019
14. What guidelines do you follow for the classification system?		CDA Hazard Potential Classification	CDA Hazard Potential Classification	
15. Has the 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)?	(Yes or No) We note that this will depend on factors, including local legislation, that are not necessarily tied to best practice. As such, and because remedial action may have been taken, a “Yes” answer may not indicate heightened risk Stability concerns might include toe seepage, dam movement, overtopping, spillway failure, piping, etc. If “Yes”, have appropriately designed and reviewed mitigation actions been implemented? We also note that this question does not bear upon the appropriateness of the criteria, but rather the stewardship levels of the facility or the dam. Additional comments/information may be supplied in your answer to Q2o	Yes. The facility experienced a slump along one of its embankments in January 2014. No impact to population or to the environment was incurred as a consequence of the slump. Corrective actions were put in place, and additional buttressing and drains were installed. Engineers of record provided the remediation designs and were on site for the duration of the work. There have been no other incidents on record before or since	Yes. The facility experienced a slump along one of its embankments in January 2014. No impact to population or to the environment was incurred as a consequence of the slump. Corrective actions were put in place, and additional buttressing and drains were installed. Engineers of record provided the remediation designs and were on site for the duration of the work. There have been no other incidents on record before or since	
16. Do you have internal/in-house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Note: Answers may be “Both”	Both	Both	The Moa Nickel Site has a tailings specialist engineer expat on site full-time and also contracts the Engineer of Record (Knight Piésold) to complete a full review of the facility every six weeks

Disclosure	Instructions	Response 2019	Response 2018	Comments
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of a catastrophic failure been undertaken, and to reflect final conditions? If so, when did the assessment take place?	Note: Please answer “Yes” or “No”, and if “Yes”, provide a date	Yes. The Hazard, Vulnerability and Risks Study was reviewed and updated in 2019	Yes. An existing Hazard, Vulnerability and Risks Study was internally reviewed in 2018	
18. Is there: a) A closure plan in place for this dam? b) Does it include long-term monitoring?	Please answer both parts of this question (e.g., “Yes” and “Yes”)	a) Yes b) Yes	No. Final and updated closure plans are being completed. Closure began in 2019 and will continue in four phases for a period totalling five years. The plan, once final, will include long-term monitoring	
19. Have you assessed, 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)?		Yes. These considerations were included in the review and update of the Hazard, Vulnerability and Risks Study in 2019	Yes. These considerations were included in the review of the existing Hazard, Vulnerability and Risks Study in 2018	
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.	Note: This may include links to annual report disclosures, further information in the public domain, guidelines or reports, etc.	No	No	

Table 2. Facility #2: North Extension

Disclosure	Instructions	Response 2019	Response 2018	Comments
1. "Tailings Dam" identifier	Please identify every tailings storage facility and identify if there are multiple dams (saddle or secondary dams) within that facility. Please provide details of these within question 20	North Extension	North Extension	
2. Location	Please provide longitude/latitude coordinates	701,000 E 222,000 N	701,000 E 222,000 N	
3. Ownership	Please specify: Owned and Operated, Subsidiary, JV, NOJV, as of March 2019	Moa Joint Venture	Moa Joint Venture	
4. Status	Please specify: Active, Inactive/Care and Maintenance, Closed, etc. We take "Closed" to mean: a closure plan was developed and approved by the relevant local government agency, and key stakeholders were involved in its development; a closed facility means the noted approved closure plan was fully implemented or the closure plan is in the process of being implemented. A facility that is inactive or under C&M is not considered closed until such time as a closure plan has been implemented	Active	Active	Will be active until end of 2022
5. Date of initial operation		2017	2017	
6. Is the dam currently operated or closed, as per currently approved design?	Yes/No. If "No", more information can be provided in the answer to Q20	Yes	Yes	The North Extension is being operated as per the design and specifications
7. Raising method	Note: Upstream, Centreline, Modified Centreline, Downstream, Landform, Other	Upstream	Upstream	
8. Current maximum height	Note: Please disclose in metres	11 m	7 m in height	
9. Current tailings storage impoundment volume	Note: (m ³ as of March 2019)	4,230,000 m ³	2,808,000 m ³	
10. Current tailings storage impoundment volume in five years' time	(m ³ as planned for January 2024)	10,580,000 m ³	6,552,000 m ³	Operations to cease at end of 2022
11. Most recent independent expert review	(date) For this question, we take "independent" to mean a suitably qualified individual or team, external to the Operation, that does not direct the design or construction work for that facility	December 2019	September 2018	Annual independent review
12. Do you have full and complete relevant engineering records, including design, construction, operation, maintenance and/or closure?	(Yes or No) We take the word "relevant" here to mean that you have all necessary documents to make an informed and substantiated decision on the safety of the dam, be it an old facility, or an acquisition, or legacy site. More information can be provided in your answer to Q20	Yes	Yes	All documents are stored on site

Disclosure	Instructions	Response 2019	Response 2018	Comments
13. What is your hazard categorization of this facility, based on consequence of failure?		Extreme	Significant	Change in consequence categorization recommended by the ITRB in 2019
14. What guidelines do you follow for the classification system?		CDA Hazard Potential Classification	CDA Hazard Potential Classification	
15. Has the 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)?	(Yes or No) We note that this will depend on factors, including local legislation, that are not necessarily tied to best practice. As such, and because remedial action may have been taken, a “Yes” answer may not indicate heightened risk Stability concerns might include toe seepage, dam movement, overtopping, spillway failure, piping, etc. If “Yes”, have appropriately designed and reviewed mitigation actions been implemented? We also note that this question does not bear upon the appropriateness of the criteria, but rather the stewardship levels of the facility or the dam. Additional comments/information may be supplied in your answer to Q20	No	No	
16. Do you have internal/in-house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Note: Answers may be “Both”	Both	Both	The Moa Nickel Site has a tailings specialist engineer expat on site full-time and also contracts the Engineer of Record (EIPH Camaguey) to complete a full review of the facility every 15 days
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of a catastrophic failure been undertaken, and to reflect final conditions? If so, when did the assessment take place?	Note: Please answer “Yes” or “No”, and if “Yes”, provide a date	No	No	The EIPH will complete this by the end of 2020. No communities or infrastructure have been identified downstream of the facility
18. Is there: a) A closure plan in place for this dam? b) Does it include long-term monitoring?	Please answer both parts of this question (e.g, “Yes” and “Yes”)	No	No	Closure plan will be completed in 2020

Disclosure	Instructions	Response 2019	Response 2018	Comments
19. Have you assessed, 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)?		Yes	Yes	
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.	Note: this may include links to annual report disclosures, further information in the public domain, guidelines or reports, etc.	No	No	

Table 3. Facility #3: Area 22

Disclosure	Instructions	Response 2019	Response 2018	Comments
1. "Tailings Dam" identifier	Please identify every tailings storage facility and identify if there are multiple dams (saddle or secondary dams) within that facility. Please provide details of these within question 20	Area 22	Area 22	
2. Location	Please provide longitude/latitude coordinates	700,500 E 220,500 N	700,500 E 220,500 N	
3. Ownership	Please specify: Owned and Operated, Subsidiary, JV, NOJV, as of March 2019	Moa Joint Venture	Moa Joint Venture	
4. Status	Please specify: Active, Inactive/Care and Maintenance, Closed, etc. We take "Closed" to mean: a closure plan was developed and approved by the relevant local government agency, and key stakeholders were involved in its development; a closed facility means the noted approved closure plan was fully implemented or the closure plan is in the process of being implemented. A facility that is inactive or under C&M is not considered closed until such time as a closure plan has been implemented	Inactive/Care and Maintenance	Inactive/Care and Maintenance	Inactive while third raise is designed and constructed
5. Date of initial operation		2016	2016	
6. Is the dam currently operated or closed, as per currently approved design?	Yes/No. If "No", more information can be provided in the answer to Q20	No	Yes	Area 22, Stage 2, is inactive and we are preparing construction of Final Stage (3)
7. Raising method	Note: Upstream, Centreline, Modified Centreline, Downstream, Landform, Other	Centreline	Centreline	
8. Current maximum height	Note: Please disclose in metres	15 m	15 m	
9. Current tailings storage impoundment volume	Note: (m ³ as of March 2019)	4,680,000 m ³	4,680,000 m ³	
10. Current tailings storage impoundment volume in five years' time	(m ³ as planned for January 2024)	4.8M m ³ total for two years of tailings storage	3.6M m ³ total for two years of tailings storage	Designs are ongoing. Final capacity will be updated
11. Most recent independent expert review	(date) For this question, we take "independent" to mean a suitably qualified individual or team, external to the Operation, that does not direct the design or construction work for that facility	December 2019	September 2018	Annual independent review
12. Do you have full and complete relevant engineering records, including design, construction, operation, maintenance and/or closure?	(Yes or No) We take the word "relevant" here to mean that you have all necessary documents to make an informed and substantiated decision on the safety of the dam, be it an old facility, or an acquisition, or legacy site. More information can be provided in your answer to Q20	Yes	Yes	All documents are stored on site

Disclosure	Instructions	Response 2019	Response 2018	Comments
13. What is your hazard categorization of this facility, based on consequence of failure?		Extreme	Significant	Change in consequence categorization recommended by the ITRB in 2019 Construction activities are underway to address this
14. What guidelines do you follow for the classification system?		CDA Hazard Potential Classification	CDA Hazard Potential Classification	
15. Has the 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)?	(Yes or No) We note that this will depend on factors, including local legislation, that are not necessarily tied to best practice. As such, and because remedial action may have been taken, a “Yes” answer may not indicate heightened risk Stability concerns might include toe seepage, dam movement, overtopping, spillway failure, piping, etc. If “Yes”, have appropriately designed and reviewed mitigation actions been implemented? We also note that this question does not bear upon the appropriateness of the criteria, but rather the stewardship levels of the facility or the dam. Additional comments/information may be supplied in your answer to Q20	No	No	
16. Do you have internal/ in-house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Note: Answers may be “Both”	Both	Both	The Moa Nickel Site has a tailings specialist engineer expat on site full-time and also contracts the Engineer of Record (EIPH Camaguey) to complete a full review of the facility every 15 days
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of a catastrophic failure been undertaken, and to reflect final conditions? If so, when did the assessment take place?	Note: Please answer “Yes” or “No”, and if “Yes”, provide a date	Yes. A Hazard, Vulnerability and Risks Study was commenced in 2019 and finalized and approved in 2020	No	
18. Is there: a) A closure plan in place for this dam? b) Does it include long-term monitoring?	Please answer both parts of this question (e.g., “Yes” and “Yes”)	No	No	

Disclosure	Instructions	Response 2019	Response 2018	Comments
19. Have you assessed, 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)?		Yes. The current Hazard, Vulnerability and Risks Study was commenced in 2019 and finalized and approved in 2020	No	The Study includes designs considering extreme weather events (such as rainfall and seismic failures)
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.	Note: This may include links to annual report disclosures, further information in the public domain, guidelines or reports, etc.			