Tailings Facilities Management

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Risks and Challenges of TMFs

TMFs are usually man-made sources of mudslides with high potential energy, and the collapse or breach of a TMF can be catastrophic for nearby populations, infrastructure, and the environment. Silvercorp places a heightened focus on the safety and environmental risks of its TMFs and puts safety of the people above everything else. The Company actively works with the government and regulators to monitor and check for hazards at TMFs to ensure top-tier safety management.

During the flood season, heavy rains may pour into the TMF, which, when coupled with inadequate drainage facilities, could cause flooding and then the collapse of the TMF.

Landslides A landslide begins with a small crack in the TMF, which slowly grows before finally causing a landslide and dam failure.

Ongoing seepage can accelerate the formation of TMF dry beaches and the solidification of tailings, making the dam more stable and safer. However, in the case of a poorly designed or constructed dam body or an aging drainage system, the infiltration line of the dam body may become high enough to cause a dam collapse.

As the water level rises, the gushing water also carries with it more sand and soil. If the sand layer under the dam is hollowed out, it will cause the dam to suddenly fall and even collapse.

Cracking in dam body

Flooding

Seepage

failures

Piping

Partial collapse or cracking in the dam body resulting from insufficient bearing capacity, improper design of the dam slope, or undesirable cross-sectional size can cause cracks to develop in the dam body and become a channel for concentrated leakage.

Response Measures

Silvercorp strictly follows the *Global Industry Standard on Tailings Management* and the *Tailings Pond Safety Regulations (GB39496-2020)*, and in doing so ensures that its tailings discharge and dam construction are carried out in accordance with relevant design requirements, operation plans, and technical specifications, ensuring effective water level control, flood control, and seepage control. In addition, we have a monitoring system in place to monitor the main technical data of the TMFs in real time and carry out regular inspections for safety hazards. We have also developed a sound emergency management system to ensure the safe and stable operations of TMFs.

The Company intends to explore the efficient management of TMFs with tailings backfilling, striving to continuously increase its tailings backfilling rates and reduce the tailings disposal rate in the next three years. Meanwhile, the Company plans to achieve a 100% comprehensive utilization rate of tailings with technological innovation by the end of 2026, realizing "zero-tailing" mines.



TMF dam slope after reclamation

Systems and Policies

We continuously optimize our TMF management system. In Fiscal 2022, we revised and optimized the following systems and polices:

- The Safety Management Policy for Control and Seepage Drainage Facilities
- The Safety Management Policy for Flood Control Measures and Flood Drainage Facilities
- The Safety Management Policy for Tailings Transportation, Dam Building, and Discharge

Emergency Planning

We have developed emergency plans to enhance the response and preparedness for emergencies and disasters at the TMFs, including the *Comprehensive Emergency Plan for Production Safety Accidents in Dry Stack TMF*, the *Special Emergency Plan for Production Safety Accidents in Dry Stack TMF*, the *On-site Rescue Plan for Dry Stack TMF*, and the *Emergency Rescue Plan for Production Safety Accidents*.

Guangdong Found stipulated a number of TMF management policies, including the *Safety Management Policy for Dry Stack TMF*, the *Safety Inspection Policy for Dry Stack TMF*, and the *Management Policy on 24-hour Monitoring, Inspection and Shift Management for Dry Stack TMF*.



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• Online Monitoring

An online monitoring system has been set up in the two major mining areas to support scientific decisionmaking through real-time monitoring of the safety status at the TMFs and enabling predictions and early warning.

GC Mine: Obtains critical real-time data from the online monitoring system in the dry stack tailings area, such as the infiltration line, the internal displacement, the surface displacement, and the precipitation. The data is synchronized to the Sky Eye and Earth Eye Safety Risk Early Warning and Prediction System for non-coal mine TMFs of the Department of Emergency Management of Guangdong Province, subject to government supervision.

Ying Mining District: The online TMF monitoring system and the key operational data are integrated into the Emergency Management System of Luoyang City, Henan Province and will be connected to the national monitoring platform as required in the future.

• Inspection and Evaluation

We have established a multi-level TMF safety evaluation mechanism for ensuring the stability of the TMF dams, reviewing TMF emergency plans and conducting a TMF safety evaluation every three years, and conducting a dam stability analysis when the tailings dam reaches specified height (which is 1/2 to 2/3 of the final design height for Grade III or lower TMFs and 1/3 to 1/2 of the final design height for Grade I and Grade II TMFs).

We also perform flood routing and a dam stability assessment every year before raining season or other extreme weather events, producing a TMF onsite inspection report and inspecting the relevant flood control facilities.

Responsibility Management

We have designated personnel for production safety, with each subsidiary appointing a safety engineer with more than ten years of experience responsible for identifying, preventing, and managing TMF risks.

• Public Disclosure

Silvercorp is committed to transparency through disclosure of TMF management in annual sustainability report and via corporate website and news releases.

Accident Reporting

We have established an open and transparent channel for reporting safety accidents while ensuring strict confidentiality of the identity information of whistleblowers.

We use the Eblog App to facilitate information-based monitoring and problem solving regarding TMFs.



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Emergency Plans

Silvercorp strictly abides by the requirements of relevant laws and regulations regarding TMF management, and has established a sound TMF emergency management system and formulated targeted emergency response plans for common TMF hazards, including Comprehensive Emergency Plans for Safety Accidents in Tailings Dry Storage Yard, Special Emergency Plans for Accidents in Tailings Dry Storage Yard, On-site Disposal Plans for Tailings Dry Storage Yard, etc. The emergency plans manage TMF safety hazards comprehensively from four aspects: accident risk analysis, emergency command bodies and responsibilities, disposal procedures, and disposal measures. In addition, the Company has installed a TMF safety monitoring system in compliance with laws and regulations to ensure real-time monitoring and surveillance of key TMF technical indicators. We also regularly carry out hazard screening inspections to ensure the safe and stable operation of TMFs.

Seepage treatment	Follow the principle of "stop inflow, and drain outflow" to treat seepage, seal leaks upstream of the dam to prevent seepage, and use filtration and seepage measures to allow the seepage water to be quickly and safely discharged without taking away soil particles, so as to stabilize the situation.
Clogged or damaged drainage facilities	When the entrance of the drainage facility is blocked, personnel should be sent to remove the debris at the entrance and stay there to ensure it works properly. In the event of a collapsed drainage well, first, clean up the entrance immediately and identify the cause, then repair the well once drainage is restored. For poor drainage caused by the collapse of the drainage tunnel, if the incoming flow upstream is not strong, shut down to reduce the amount of water entering the reservoir and repair the collapsed tunnel; if the collapse is severe, first make proper evacuation arrangements of the people in the downstream area according to the situation, then take measures to control the dam's drainage.
Crack treatment	Sliding cracks should be treated in combination with the strengthening of the dam slope. Non-sliding cracks. For non-sliding cracks, shallow cracks or cracks in an anti-seepage section can be treated through excavation and backfill; cracks in the dam body or deep surface cracks can be treated with grouting. A combination of excavation and backfill and grouting can be used to treat medium depth cracks due to high water levels or excavation difficulties.
Landslide treatment	When signs of a landslide are found, or a landslide is about to happen but has not yet collapsed, effective measures should be taken immediately to prevent further deterioration. Once a landslide occurs, reliable treatment measures should be taken to restore and reinforce the dam slope and improve the anti-collapse capability. Ensure construction safety during disposal. The basic principle of landslide treatment is to reduce load at the upper part and add weight at the lower part, i.e. to cut the slope at the main crack site and to put the weight at the foot of the dam. Minimize the reservoir water level, and open ditches along the sliding body and the nearby slope to guide seepage so that the seepage water can drain quickly. If the sliding crack reaches the foot of the slope, put weight on first. When treating backwater slope landslides caused by leakage from the earth dam, the water-facing slope shall be treated simultaneously by dumping soil on the slope to prevent seepage. Before landslide treatment, the area shall be covered with waterproof materials such as plastic film, to prevent rain water from seeping into cracks.



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Danger may occur when the drainage facilities have been fully used but the water level continues to rise. Measures should be taken to build sub-dams promptly to increase the water retaining height. In the case that the top of the dam is not wide enough and the soil quality is poor, an ad-hoc sub-dam can be built with earth bags. In particularly urgent situations, extraordinary measures can be taken to lower the water level.

In the event of a flood, first stop the discharge of tailings to the TMF and increase the flow of flood discharge. If necessary, use mechanical force drainage or other measures to lower the water level in the TMF as much as possible. Mechanical equipment and vehicles can be stacked on the dam to increase dam stability. Increase the discharge of the energy dissipation pool in front of the dam to prevent rising water level from affecting dam stability through soaking the food of the dam slope. Plug, fill and compact cracks and pits to prevent further damage to the dam.

If the hazard expands and a dam collapse may occur, promptly notify people to prepare for evacuation and actively cooperate with local government authorities to organize people to evacuate and take shelter following the emergency plan of the government.

When a hazard occurs, first stop the discharge of tailings to the TMF and take measures to maximize the drainage capacity of the reservoir area. Mobilize personnel and vehicles to seal the cracks with sand bags, possibly with the help of mechanical equipment. At the same time, stack gravel on the dam to strengthen dam stability, and the local government shall arrange for the immediate evacuation of people downstream.

Actions in Fiscal 2023

Anti-overflow

measures

Flood prevention measures

Measures to prevent

dam collapse

Henan Found: Installed on-line monitoring equipment for the 13th stage dam surface covering and dam surface ditch restoration project, and the 12th stage dam of the Shiwagou TMF; completed the 10th Dam surface covering and dam surface ditch restoration and the 11th dam stacking and surfacing projects of the Zhuangtou TMF; and evaluated the safety conditions of the Shiwagou and Zhuangtou TMFs.

 $^-$ Guangdong Found: Invested over \$96,331 to implement the TMF reinforcement project of its tailings dry yard.

Guangdong Found: Digitalized TMF safety management by adding a new daily inspection form for mechanical and electrical equipment, optimization of existing forms, and adding ten forms in the safety management system of the Eblog app, including five equipment daily inspection forms, four equipment onsite inspection forms, and one form for miscellaneous inspections.