



TAILINGS STORAGE FACILITY

DESIGNED FOR SAFETY

- Midas Gold’s tailings storage facility (TSF) is designed to meet or exceed the most stringent design factors-of-safety set forth in Idaho regulations. The TSF will incorporate industry best practices related to the lifecycle design, management and closure of the facility. *(See: Midas Gold Idaho, Plan or Restoration and Operations (PRO) Section 11)*
- Specific design elements will prevent breaching, overtopping, leaking, and excess water accumulation; promote long term geotechnical stability; provide redundancy for critical components of the water management system; and reserve capacity to store any excess water accumulation that may occur. *(See: PRO; Section 11.2.1)*
- After considering multiple possible locations, the Stibnite Gold Project TSF was strategically proposed for a site where surrounding granite mountains will constrain 90% of the perimeter of the facility. The remaining 10% of the perimeter will be retained by an embankment and further buttressed by an additional 65 million tons of coarse rockfill placed against the embankment over the life of the project. The buttress more than doubles the factor of safety versus the State requirements Midas Gold must meet. *(See: PRO; Section 11.2; 11.5)*
- The TSF will be constructed with coarse rockfill and built using the safest downstream construction method. *(See: PRO; Section 11.4)*
 - In this construction process, each successive lift of the dam is built further downstream of the tailings storage area and placed on the valley floor and upon the previously placed rockfill.
 - Downstream constructed, rockfill dams are recognized as the most stable TSF embankment construction option under static and seismic loading.
 - The final TSF is designed to withstand an earthquake with roughly 6 times stronger shaking than the March 2020 6.5 magnitude quake.
 - The more problematic upstream construction method places embankment lifts on less stable tailings – this method will not be used at Stibnite.
- The Stibnite Gold Project TSF will be fully lined with both a geomembrane and geosynthetic clay liner to create redundancy in the system and prevent seepage. *(See: PRO; Section 11.2.2; 11.2.3)*
 - The primary function of the geosynthetic clay liner (GCL) is to cushion and protect the overlying geomembrane.
 - An additional benefit of the GCL is that the clay within it will swell and seal any damaged areas of the geomembrane.
 - The bentonite clay within the geosynthetic clay liner is a naturally low-permeability material that will not degrade with time.
 - The specialized polyethylene component of the tailings facility liner system, the geomembrane, has a half-life of over 450 years.
- Additionally, the tailings themselves will consolidate into a nearly impermeable mass as they settle and dewater over time.
- Midas Gold has designed the TSF so that it has sufficient water storage capacity even if the site experienced the ‘Probable Maximum Precipitation’ – the greatest amount of precipitation physically possible in the watershed.



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- These events are so rare that it is estimated they happen less than one time during a 10,000-year period. However, if such an event were to happen, the TSF would still have an additional four feet of freeboard, separating the waterline and the top of the dam.
- The PMP runoff volume equates to six to seven times a 500-year, 24-hour storm runoff volume at the facility.
- For most of its operating life, the TSF will far exceed the flood storage capacity listed above, because the minimum capacity applies at the end of a stage, just before the next stage of facility expansion is complete and the previous stage is reaching its design capacity.
- Once the next stage comes online, it will have a capacity for a few years' worth of tailings and therefore water – far more than the design flood volume.
- Key chemicals of concern in the tailings will be neutralized, stabilized, or removed before deposition in the TSF:
 - Most mercury is recovered during ore processing and securely stored prior to shipment to a RCRA certified hazardous waste disposal facility.
 - Weak Acid Dissociable (WAD) cyanide is neutralized down to less than 10 ppm before the tailings are pumped to the TSF. WAD cyanide levels below 50 ppm are considered safe for wildlife.
 - As a result of lime and limestone addition in the ore processing facility, and the natural buffering characteristics of the ore, the pH in the tailings will remain neutral (not acidic) in the long term.
- In addition to protecting wildlife and the environment, Midas Gold is also incentivized to neutralize cyanide before it reaches the tailings storage facility because water from the TSF will be recycled back into the ore processing facility. (*See: Pro; Section 10.1.10*)
 - Should WAD cyanide levels be above 10 ppm when water is reintroduced into the ore processing circuit, it would negatively impact gold recovery.
 - As a result, Midas Gold will be targeting cyanide levels below 10 ppm in solutions to be discharged from the process plant, well below the level of 50 ppm considered protective of wildlife.
- Tailings are thickened before being pumped to the TSF to reduce the amount of water being introduced to the TSF and to promote earlier consolidation of the tailings.
 - Additionally, Midas Gold will use evaporators during operations and pre-closure to further reduce water levels on an ongoing basis.
- Midas Gold will divert clean water coming from Meadow Creek and its tributaries around the TSF in surface diversions designed to convey the 100-year peak runoff in order to minimize any interaction between the tailings facility and clean water. The objective is to keep clean water clean.
- Pipelines carrying tailings to the TSF and reclaim water from the TSF will be contained in lined channels or secondary pipes, and would drain to a lined pond with the capacity to handle the contents of the pipelines plus a 100-year storm with snowmelt.
- To ensure the TSF is always functioning properly, the necessary repair parts to address a pipe rupture or pump failure will be stored on-site. Additionally, the pumping system that returns water to the ore processing plant will have built in redundancy and have at least one spare pump installed in addition to the operating pump.



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- Nearing closure, Midas Gold will heighten its focus on eliminating excess water in the facility while monitoring consolidation (settlement) of the tailings. After sufficient consolidation, the TSF would be covered and Meadow Creek restored across the surface.
 - Beginning later in operations, freshwater consumption would be reduced (thus increasing recycling of water from the TSF) and use mechanical evaporators (similar to snowmaking machines) to reduce the pool volume and the need to treat and discharge water. Remaining water would be treated to meet applicable water quality standards prior to discharge.
 - Once the tailings surface allows for equipment traffic, a cover comprising development rock and topsoil will be placed on top of the tailings and Meadow Creek and its tributaries will be restored across the top of the facility in lined channels.
 - The restored channel and floodplain corridors will be separated from the tailings with a geosynthetic liner to prevent the surface water from interacting with the stored tailings and to protect long-term water quality at the site.
 - Above the floodplain corridor liner, there will be an armor layer to prevent the stream from scouring down to the liner while allowing for a dynamic and naturally functioning stream system within the overlying floodplain/alluvium fill.
- **NOTE:** Midas Gold’s modifications to TSF liner design are reflected in Alternative 2 of the Draft Environmental Impact Statement. In Alternative 3 the TSF is proposed to be located in the upper reach of the EFSFSR; Midas Gold does not prefer this location for many reasons. The Alternative 3 location occurs adjacent to identified geohazards that pose unnecessary risk to TSF embankment stability. Additionally, the Alternative 3 TSF location would impact a currently pristine reach of the East Fork South Fork of the Salmon River and would have a disturbance footprint nearly 100 acres greater than that of Alternative 2.