



Tailings storage facility – Gold Quarry, Nevada



Tailings Fact Sheet

BACKGROUND

Tailings are the fine grained material remaining after the valuable minerals are separated in hard rock mining and ore processing. Newmont's mines are hard rock operations and generate tailings, with one exception where only heap leach processing is utilized. This fact sheet provides an overview of the Newmont Corporate standards and requirements for tailings management at each of our operations.

Tailings are created as the mined ore is processed into particles of fine sand through crushing, grinding and milling. Mined ore rock is moved to the milling circuit where the rock is reduced into sand and silt sized particles and then mixed with water and moved as slurry through the gold, silver and copper extraction process. The valuable minerals are separated from the rest of the milled rock particles either through physical or chemical processes. After removal of the valuable minerals the remaining milled rock slurry, now referred to as tailings, is pumped or flows by gravity to an engineered impoundment area. These engineered impoundments are carefully designed, constructed and operated to safely contain the tailings and water even during extreme climatic or seismic events. Depending on the chemical characteristics of the tailings and the surrounding environment, the engineered tailings impoundment will generally be lined with a synthetic geomembrane such as high density polyurethane (HDPE) and/or clay to prevent seepage into the groundwater system. As the tailings slurry is deposited in the impoundment the water separates from the heavier sand and silt particles and collects to form a pond within the impoundment. The tailings pond water is then recycled back into the milling process for reuse. The tailings are contained within the impoundment facility and once full, the impoundment is

permanently capped (similar to landfills), reclaimed and closed to protect the environment.

OVERVIEW

Newmont's geotechnical engineering guidelines, construction and operating standards and technical guidance explicitly cover tailings management and establish minimum requirements to ensure safe and stable facilities throughout their operating and post-mine closure life. The design, construction and operation of all tailings impoundment facilities are scrutinized through our Investment System process, followed by inspections and audits and strict application of annual inspection by qualified engineers. Newmont's Environmental Standard for *Closure and Reclamation Management* covers the long-term management of tailings impoundment facilities to ensure safe and stable conditions.

CONTEXT

Newmont has both operational and closed tailings impoundments in a variety of climatic and topographic settings. Newmont conducts extensive siting, engineering, environmental and social studies to support the specific selection and design of each facility. Annually, Newmont safely manages and disposes more than 150 million tonnes of tailings that are placed within engineered, surface containment facilities; used to backfill former mining pits; or placed as structural backfill paste in underground mines. Due to natural geologic and geographic conditions at the Batu Hijau copper and gold mine in Indonesia, tailings are safely deposited in a deep sea canyon offshore after being treated and tested.

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STANDARDS

Newmont's Environmental Standard for Tailings and Heap Leach Facility Management is comprised of requirements for Planning & Design, Implementation & Management, and Performance Monitoring. All Newmont tailings facilities must comply with these minimum requirements in addition to the legal requirements within the local jurisdictions:

Planning & Design

- Management Plan that details control of pollutants, requires all facilities must meet legal requirements, and includes risk assessment, inspection and monitoring plans with performance indicators, roles and responsibilities, training requirements for operators, and emergency response plans.
- Fluid management plan that describes management of solution levels, water balance, trigger alert levels and contingency plans during operations, closure and reclamation phases.
- Characterization and specifications for geochemical and physical properties of the construction and tailings materials.
- Engineering requirements for seepage control, liners, and leak collection recovery systems.
- Engineering requirements for storm containment and runoff.
- Requirements for piezometers to monitor solution pressure in the embankments and tailings.
- Risk based assessments of facilities in environmental sensitive areas or pose potential risks to downstream communities to determine whether the design criteria ensure adequate levels of protection.
- Quality control and Quality assurance protocols are required to document the construction complies with engineering design.

Implementation & Management

- Fluid management plans must be reviewed and updated annually.
- Water balances are updated over the life of the operations to reflect changes in mine plans, processing and operations.
- The tailings facilities must be operated within design specifications including piezometer head in embankments and tailings.

Performance Monitoring

- Tailings impoundments shall be inspected for erosional and geotechnical stability by qualified engineers on an annual basis.
- Routine inspections to verify integrity and to support maintenance and repair programs as defined in the monitoring plans.
- Piezometric monitoring and reporting as defined in the monitoring plans.

TECHNICAL GUIDELINES AND STANDARD OPERATING PROCEDURES (SOPs)

Newmont's Technical Services team has developed *Tailings Facility Geotechnical Guidelines* that defines minimum requirements for tailings impoundments:

- Definitions for tailings embankments
- Responsibilities of engineering and management staff
- Geotechnical input design criteria guidelines for:
 - Foundation settlement and consolidation
 - Seismic loading
 - Liquefaction
 - Hydraulic properties of the foundation, soil liners and drainage layers
 - Water management systems
 - Tailings rheology and characteristics
- Geotechnical process design for:
 - Geotechnical field investigations
 - Laboratory testing
 - Engineering design
- Geotechnical design requirements for each level of Project Design
- Risk analysis
- Quality assurance / quality control

Newmont's Technical Services team has also developed *Seismic Design Criteria Guidelines* that defines minimum requirements for design, construction and operation of tailings impoundments to ensure safe and stable operations for region specific seismic events.

Each operation develops and implements site specific Standard Operating Procedures (SOPs) and manuals based the tailings impoundment design. Site specific SOPs consist of per shift activities including inspections of pipelines, open liner, embankments, pond levels and leak detection systems.

EMERGENCY PLANNING, RESPONSE AND COMMUNICATIONS

All Newmont operations have Emergency Response Plans that define chain of command and communications during emergencies. Additionally, Newmont operations have developed site specific dam break inundation analysis plans to support emergency planning including communications and evacuation notification. In most jurisdictions Newmont operations also do joint drills and exercises with local emergency response teams to prepare for emergencies. It should be noted that Newmont has contingency plans in place at every operation that describe trigger levels and detailed actions required to prevent overtopping of tailings impoundments.

CORPORATE AUDITS, INSPECTIONS AND REPORTING

Newmont has a number of programs through the Sustainability & External Relations and Technical Services teams for auditing, inspecting and reporting on our tailings facilities. The Technical Services team routinely conducts geotechnical reviews with the internal engineering team and reviews annual inspection reports prepared by qualified engineers. Reporting on tailings management systems at the corporate level can be found at: sustainabilityreport.newmont.com/environmental-waste.php.