

# Improve Tailings Monitoring with Better Topography

## A Multi-Layered Approach to TSF Monitoring

### What is Layered TSF Monitoring?

Combining datasets that include client data and satellite data, with deep learning technology to produce topography helps tailings teams create a more comprehensive understanding of their tailings storage facility (TSF).

This layered approach to monitoring the topography of the TSF provides a more nuanced understanding of the site and clearer data that can lead to better decision-making. Drawing on a foundation of highly accurate remote sensing data, tailings teams can build out Digital Elevation Models for an enhanced view of operations, infrastructure, and the overall TSF site.

#### Client/Site Data

Our strategic partners, including on-site client teams and third party providers, collect a wide range site data.

- Drones
- LiDAR
- Bathymetry
- Ground control



#### Proprietary Deep Learning-Powered Survey Data

PhotoSat uses proprietary deep learning technology built on a trainable convolutional neural network (CNN) that continually improves through training. This technology allows us to generate high-accuracy topographic surveys.



#### Satellite Data

Our team of specialists orchestrates the data collection and consolidation of new and archived satellite imagery applied to a wide variety of use cases.

- Historical satellite photos date as far back as the 1960s.
- Modern topography combined with historical data to map changes to the tailings infrastructure over time.



### Layered Intelligence for Better-Informed Tailings Management

Layered monitoring integrates client/site data, satellite data, and deep learning-powered survey data to create highly accurate topography spanning many square kilometres and other data-rich charts, including freeboard maps, dam height charts, tailings beach length, and profile lines. Together, these three layers form a comprehensive view to enhance operational efficiency and responsible tailings management.

Layer	Approach	Description	Value
Foundational	Client/Site Data	<p><b>Drones:</b> Conduct localized and detailed surveys, perform small-scale mapping and volumetric analysis.</p> <p><b>Bathymetry:</b> Map the underwater topography of tailings ponds.</p>	<p>Drones allow for frequent deployment. However, they are limited by site access for drone operators, permitting, and weather conditions.</p> <p>Track water volumes and monitor deposition to support water balancing, operational planning and capacity tracking.</p>
Enhanced	Satellite Data	<p>Remote sensing for consistent, site-wide coverage without onsite personnel. Archived satellite imagery reveals historical site conditions pre-construction and during early operations.</p>	<p>Historical archives allow tailings teams to understand the changes in their site over time. When paired with modern satellite data, this site-wide topography is trusted by the largest mining organizations in the world.</p>
Transformative	Deep Learning Technology	<p>Advanced synthesis of client/site data and satellite data, paired with deep learning-produced topography, provides high-accuracy topographic surveys.</p>	<p>Better data and informed decision-making.</p>

### Key Benefits of Layered Monitoring

- A more complete view of the TSF.
- A comprehensive dataset that tailings teams can derive into any number of helpful charts, graphs, and other documentation.
- Actionable insights that inform decision-making in key areas of compliance and operational planning.
- Historical satellite data can be used to reconstruct past Digital Elevation Models and compare them against current conditions.
- Harnessing advanced synthesis of current remote sensing data and historical imagery and topography, tailings teams uncover a more transparent “data story” of the site, spanning several decades.

### Filling in the Gaps with Accurate Data

Layered monitoring combines current remote sensing data, historical imagery, and deep learning to help TSF teams transform complex, multi-source data into actionable insights for smarter site management and better decision-making.

Tailings site use cases include:

- Tailings Deposition Monitoring
- Tailings Beach Slope and Length Measurements
- Freeboard and TSF Capacity Measurements
- TSF Tailings and Water Volume Measurements

### Bottom Line

PhotoSat is a vital piece of the layered monitoring puzzle. PhotoSat provides the data to achieve a comprehensive view of your mine site and tailings facility through satellite surveys generated with proprietary deep learning technology. Layering data helps your team fill gaps in its knowledge of the TSF, supporting operational efficiency, aiding in maintaining compliance standards, and creating a more complete picture of your site.

Better data means better decision-making for responsible tailings management.