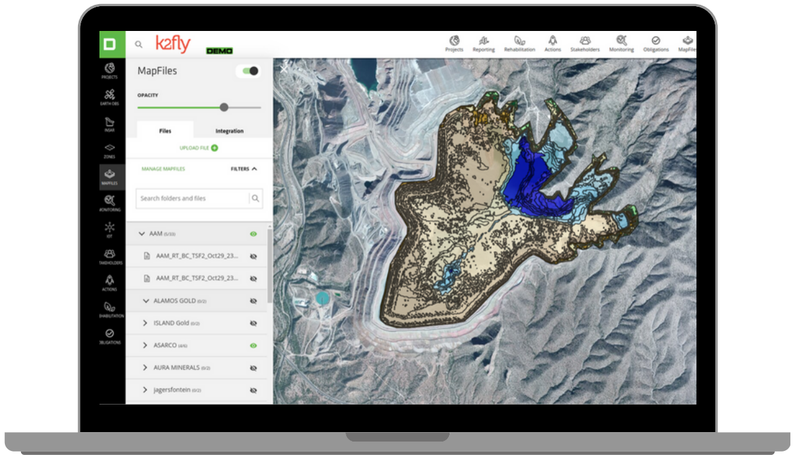
LEVERAGING ‘TIRI’ DATA TO ENHANCE TAILINGS MANAGEMENT

Utilize a solution like K2fly Tailings Management and Tailings and Impoundment Reflectance Index (TIRI) data for next level guideline and compliance monitoring.

K2fly and AssetAssurance Monitoring (AAM)

Our solutions contribute to asset status information and decision making support.

K2fly delivers enterprise resource governance software solutions for asset intensive industries to enhance their ESG performance. With a Tailings Management solution that enhances reputation and social licence to operate, improves stakeholder trust, and safeguards against environmental and safety impacts, our approach delivers certainty that operating practices comply with standards, ensuring the safety of surrounding communities and environment.



AssetAssurance Monitoring (AAM) is a geomatics integrator offering sector innovations to support decision making with near real-time asset data acquisition assessments and processing. Delivering solutions to mine waste tailings and impoundments monitoring through proven strategies including, Tailings and Impoundments Reflectance Index (TIRI).

This paper explores the application of the Tailings & Impoundment Reflectivity Index (TIRI) to site specific management and monitoring of tailings.

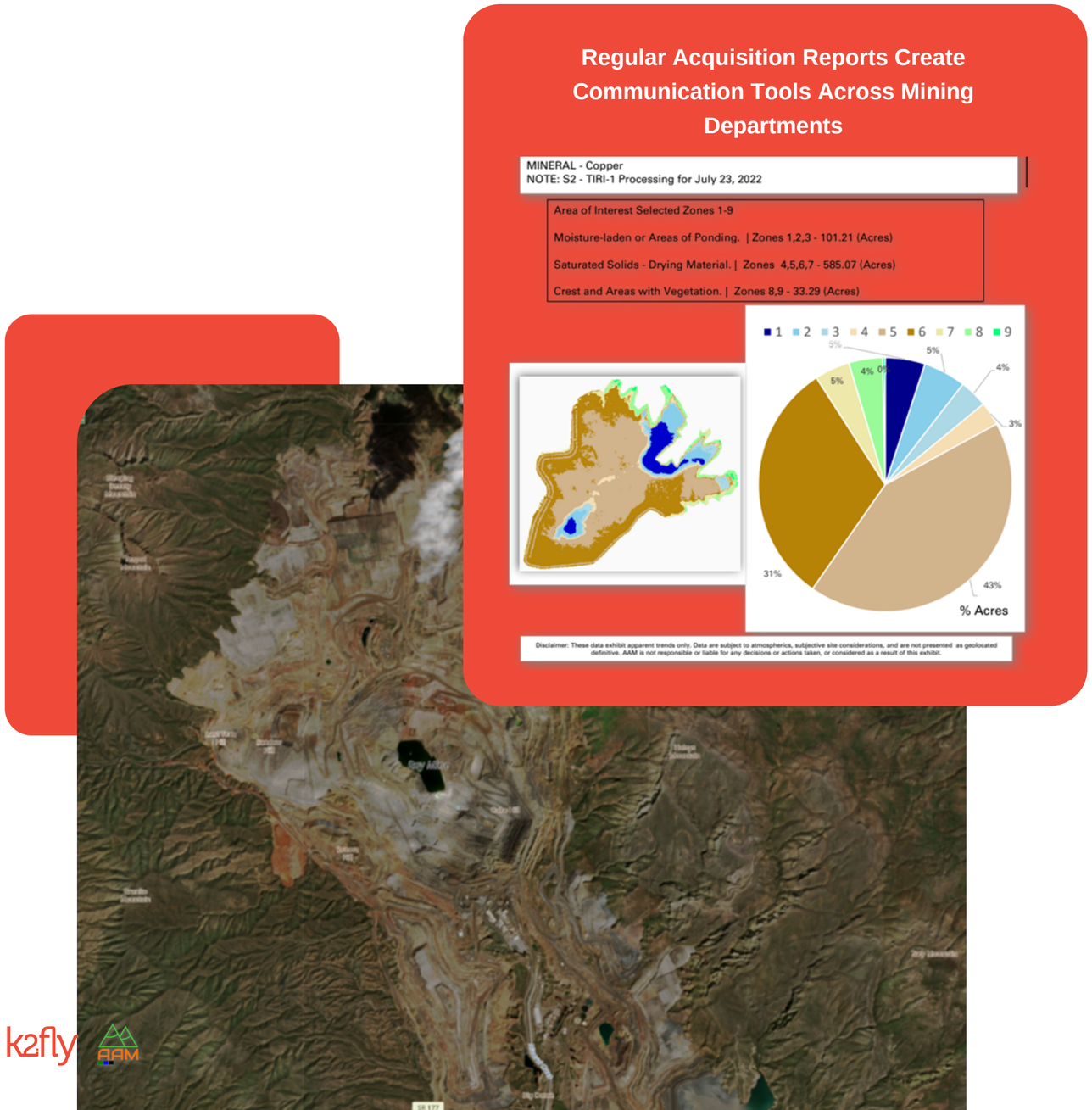
Introduction

Tailings are the waste materials created as part of the Mining and Production process and are stored in large dams – commonly referred to as tailings storage facilities (TSFs) or Impoundments. This material, in various fluid /material concentration is not competent. It is often a slurry, or at best a more paste-like material.

Operational challenges, local conditions, and inadequate mine site monitoring of the TSF structures can result in catastrophic environmental, social, and financial consequences. Almost on a regular basis of several months-- we have witnessed both minor and severe – resulting in more than 270 fatalities failure.

As a result of several incidents since 2014 a series of global reviews, conferences, and management initiatives culminated in the recent ICMM, UNDP, and Church of England sponsored Global Industry Standard on Tailings Management (GISTM) guidelines. Key considerations call for regular monitoring and the sharing of asset data with relevant third parties such as the Independent Tailings Review Board (ITRB), an Engineer of Record (EOR), and Accountable Executives.

As a supportive and contributory data resource the Tailings Impoundment Reflectivity Index (TIRI) is a remote sensing data output created to illustrate relative tailings material and solution deposition.



Water volumes and materials in solution are a dynamic component of active TSF operations. Additional precipitation or significant processing and mill issues may impact the regular operational status of the TSF.

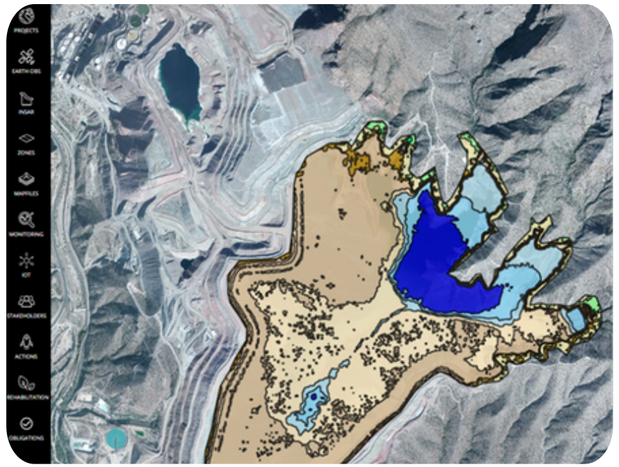
The use of TIRI allows for a regular, replicable and valid exhibit of differential depositions over time. Intra-monthly acquisitions and assessments – provide users with dynamic awareness and tabular areal (zones) references across the changing asset.

Satellite-based TIRI is a well-founded Earth Monitoring technique. Based on decades of data results from instruments aboard Landsat and Sentinel-2 the sensor responses and calibration over time assure a requisite level of accuracy and precision. Open access results are over sampled and segmented zones pan-sharpened for illustrations with 5 meter resolution (Sentinel-2). Data equating historical events, seasonal actions and production changes, expressed visually and through time series data, provides an innovative method of monitoring deposition progress and practice.

K2fly Mapfiles for TIRI

Tailings Impoundment Reflectivity Index (TIRI) data provides support for a better appreciation of the site's overall stability and health status. At a macro and localized level, this data adds valuable context when combined with other monitoring data from the facility.

Through K2fly's ground-breaking use of cloud-distributed geo-processing of large datasets, users can interact with TIRI results and get instant feedback on the situation on the ground over time with easy-to-interpret map visualizations and charts. K2fly makes data easily available and reduces reliance on static reports, allowing expert users to provide oversight.



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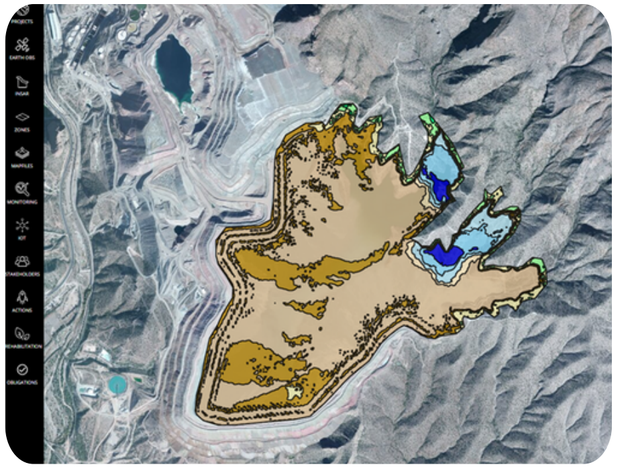

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Through the K2fly Mapfiles module, users can build visualizations of water accumulation at a facility. Periods of progressive accumulation and tolerance exceptions are highlighted on maps and charts.

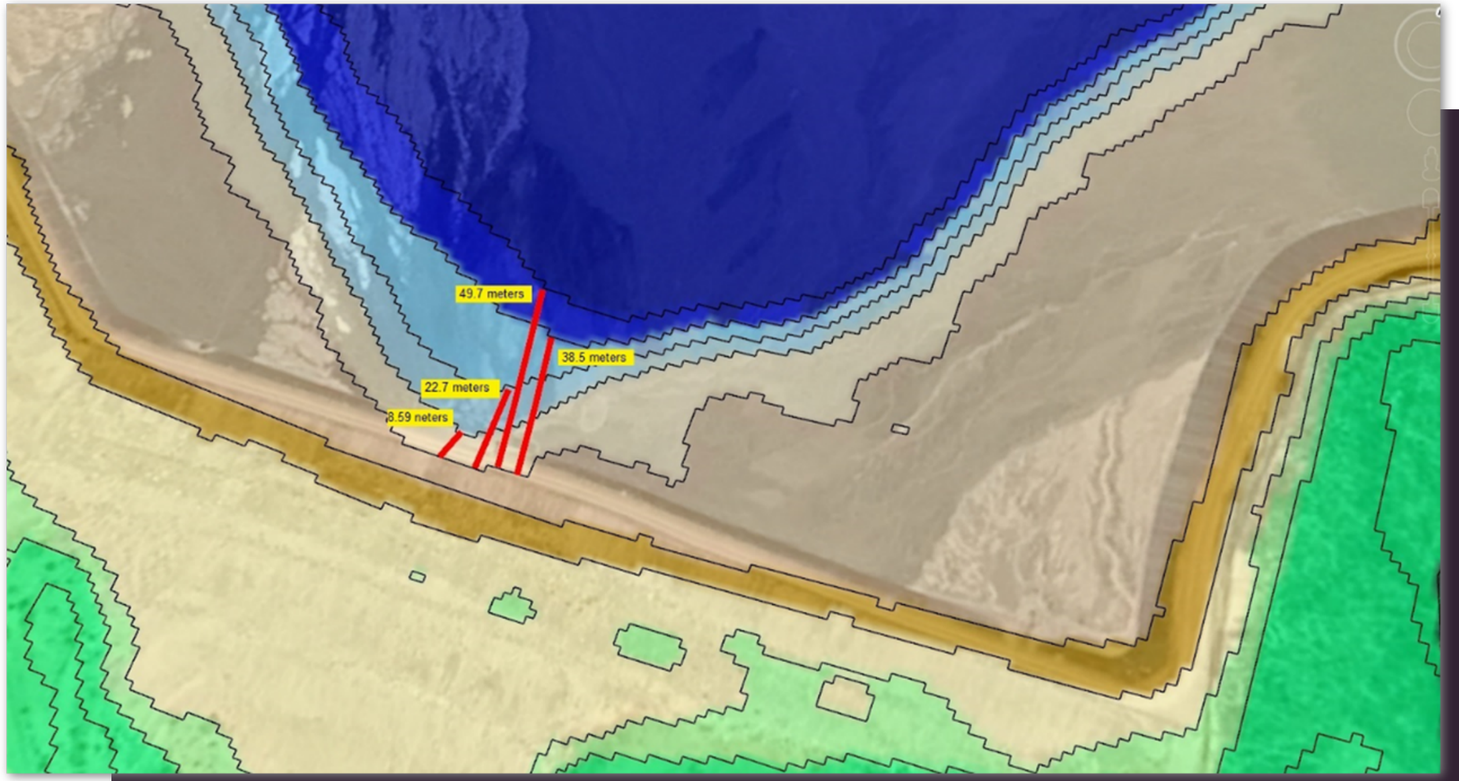
Analysis can be conducted on multiple stacks with dynamically rendered map layers, providing important context to the user on how TIRI data relates to other monitoring data visualizations, from piezometers, other IoT devices, ground-based monitoring programs, and more.

TIRI data has been successfully used to assess specific events

Site operating guidelines and Engineer of Record specify a TSF pond limit of 200 meters from the crest.

Seasonal rainfall and increased production push the pond to within 8.59 meters.

TIRI data detail and exhibit event incident and awareness offered production changes and engagement of Emergency Response Plan – averting a larger “incident”.



Conclusion

In a world where Environmental, Social, and Governance (ESG) are gaining criticality rapidly, and TSF's are being scrutinised by management more than ever, Visualisation of Tailings Storage Facilities and data interrogation is becoming more prominent. The efficient collaboration by Assest Assurance Monitoring (AAM) and K2fly has shown that it can be effectively configured so that end users can benefit from the vivid and rich outputs the views can provide.

Learn more at:

www.k2fly.com

www.aamonitoring.net