



SURVEILLANCE AND INTELLIGENCE

Life of Mine: Mine Closure Monitoring

MDA's Life of Mine (LOM) suite of products and services supports mine closure programs by providing mining companies with cost-effective, long-term monitoring solutions that deliver accurate and timely access to critical information for mine operators.

Understanding and mitigating potential risks during the Mine Closure Phase can be simplified with regular space-based remote monitoring and easily interpreted reports. Mining operators are required to follow strict procedures dictated by mining regulations, while maintaining budget and keeping to schedule. MDA's LOM products and services improves the quality of closure planning with an emphasis on quality data and analysis to support design, planning and operations towards mine closure.

MDA's Mine Closure products and services provide mining companies with cost-effective space-based monitoring using the RADARSAT-2 satellite, including Interferometric Synthetic Aperture Radar (InSAR) monitoring solutions, to assist in identifying and tracking:

- Ground movement within millimetre accuracy
- Soil saturation and vegetation health
- Revegetation and environmental restoration status

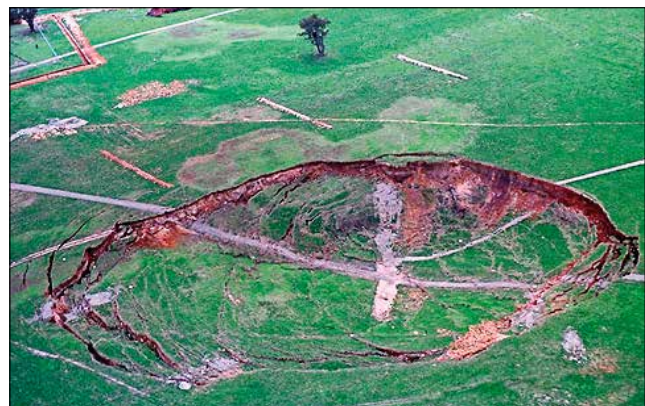
Throughout the Mine Closure Phase and beyond, MDA's Mine Closure products and services supports the early detection and reporting of predictable and unpredictable risks, and provides monitoring to achieve sustainable rehabilitation outcomes.

After operations cease, the monitoring information serves as a valuable resource for assessment and site restoration. Serving as historical baseline information, MDA's archive of optical and SAR satellite imagery spans two decades and is a useful resource for site remediation and restoration activities.



Rehabilitating former mine sites in remote locations is made easier with regular monitoring of surface movement and vegetation from high-resolution satellites.

MDA's Mine Closure products and services is an essential management, environmental and geotechnical tool to support monitoring of mining operations when nearing or engaged in the Mine Closure Phase.



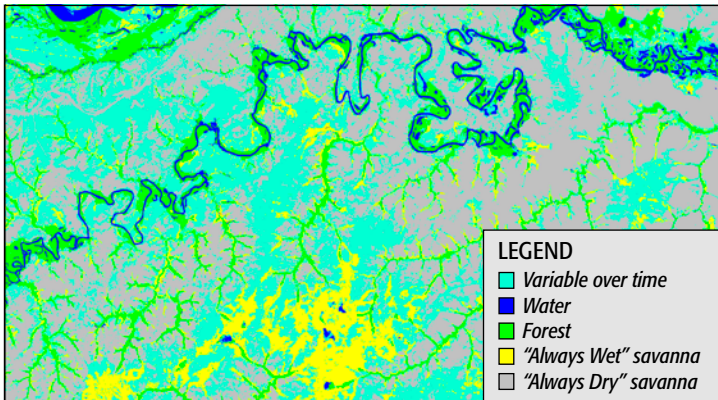
Monitoring ground movement to the millimetres level can serve as an early warning system to prevent larger events from occurring such as the subsidence due to block caving at the Ridgeway Mine, New South Wales show above.

Ground Movement Monitoring

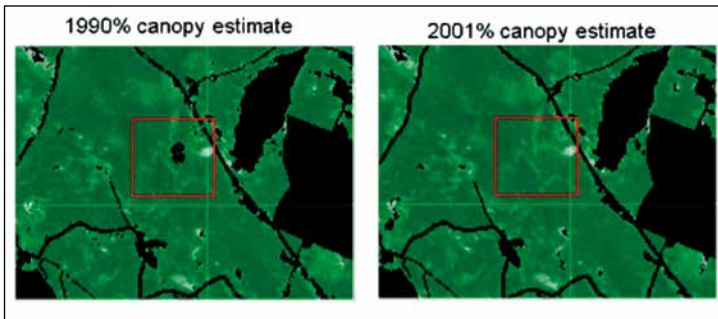
Mine operators rely on MDA's LOM products and services to deliver accurate InSAR information on ground movement, measured to millimetre-level accuracy. InSAR site monitoring is commonly implemented as a standalone program, however, MDA can integrate its ground movement monitoring information into existing customer systems to augment in-situ solutions that use data collected by GPS or tiltmeter networks.

Soil Saturation and Vegetation Health

Using archived satellite imagery of a mine site prior to development, MDA can establish typical soil saturation conditions or vegetation health in certain areas. The same parameters can be monitored periodically throughout the operations phase to assess whether changes that may occur in regions near the mine are typical or anomalous, providing a road map to maintain or restore the area to natural levels.



A soil saturation product serves as a useful baseline for understanding natural levels both before, and after a mine's operational life cycle.



The example above shows a tree canopy estimate where black indicates zero percent change, and light to dark green indicates increasing tree canopy.

Revegetation and Restoration

MDA uses a combination of radar and optical satellite imagery to evaluate and document the progression of revegetation programs over time, by mapping ground cover. This is a cost-effective method to determine the effectiveness and progress of vegetation programs over wide areas, to support budgetary assessment for ongoing work, and for environmental compliance reporting.

Effective Monitoring Delivers Critical Information

MDA's Mine Closure products and services is based on a recognized and acceptable methodology for site monitoring. It provides cost-effective, wide-area coverage of the total mine area and surrounding regions.

It is a vital tool for high-level, forward-looking risk analysis for tailings management facilities, waste dumps, and mined rock material and their potential impact on the site as well as neighbouring third party infrastructure. Effective routine monitoring reduces or eliminates the need for dedicated personnel on sites conducting traditional surveys and measurements. The scalable level of monitoring is ideally suited to monitoring single or multiple sites, and is an effective method of understanding and managing land reclamation processes.

MDA's Mine Closure products and services delivers essential monitoring services for long-term analysis and observation, and remediation after mine closure as directed by local mining laws.

CUSTOMER SATISFACTION

For more than four decades, MDA has worked with its worldwide customer base to provide information solutions that leverage advanced technologies and improve business efficiency.

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