



Satellite imagery tracks mine rehabilitation in Namibia

Namibia is a primarily rural, arid country that is host to over 2 million people covering an area of 824,292 km². Known for its diamond, uranium, silver and gold exports it is rich in natural resources. Mining provides 25% of the country's revenue and all extractions require strict restoration and rehabilitation once a site is decommissioned.

The impact of gold mining

Gold mining world-wide is a costly and difficult process. Excavations must be made, rock crushed and gold extracted. Stripped hillsides and large waste rock dumps must be restored to their original state. The rehabilitation process involves shaping and covering the waste rock dumps in a suitable grow medium followed by re-planting vegetation.

In Namibia, mining activities are only approved after extensive Environmental Impact Assessments (EIAs) are done and Environmental Management Plans (EMP's) approved by government. Non-compliance with EMPs may result in the levying of extensive fines and sanctions. To ensure compliance with legislation, Navachab Gold Mine contracted Geo Data Design to monitor the rehabilitation progress. "Given the environmental impact, Namibian authorities are taking a strong stance on mine rehabilitation, and Navachab is taking the lead with its rehabilitation monitoring program" says Jaurez Dorfling, technical director of Geo Data Design.

Ground-based monitoring prohibitive

AngloGold Ashanti is one of the world's foremost gold exploration, mining and marketing companies, with a large portfolio of operations across four continents, including extensive sites in Namibia that span hundreds of kilometers. These sites require strict rehabilitation and ongoing monitoring.

"Rehabilitation sites are usually comprised of small, geographically distinct, non-contiguous mosaics," Ms Marietjie Bell, Environmental Coordinator of the Anglo-Gold Ashanti Navachab Gold Mine, explains. "Ground-based monitoring techniques like Ecological Function Analysis (EFA) and Land Function Analysis (LFA) are time and labor intensive, and the on-site staff generally do not have the correct skills for monitoring vegetation change and assessment. Laser scanning

Company information

Headquartered in Cape Town, South Africa, Geo Data Design is a provider of high-quality, high-resolution satellite imagery. Geo Data's highly experienced team has many years of expertise in working with satellite imagery projects across the African Continent.

GOLD MINES



Geo Data Design/Namibia Mine Rehabilitation

is an option, but it is prohibitively expensive and requires highly-trained professionals not readily available in Namibia’s remote regions.”

Satellite imagery tested in pilot project

Monitoring mine rehabilitation sites is an ongoing task. The status of rehabilitation projects is constantly changing and evolving into new areas. With authorities demanding close monitoring and detailed reporting, AngloGold Ashanti tasked Geo Data to develop a repeatable, cost-effective solution.

“Up until now there have been no fixed mechanisms in place to prove that vegetation cover has been restored to meet standards,” Ms Marietjie Bell says. “We procured DigitalGlobe high-resolution imagery in the Navachab gold mine rehabilitation project as a test. We quickly found its high spatial resolution delivered an effective remote monitoring solution of the small non-contiguous patches that characterize these projects.”

The basis for an ongoing solution

Geo Data processes 50cm high-resolution imagery of the site twice each year to supply dry and wet-season images. These high-resolution seasonal datasets are then used for change detection and rehabilitation monitoring.

“Because the same sensor is used from season to season and from year to year, the imagery is easy to compare, and at the same time, pre-processing is reduced,” Dorfling says. “Advanced change detection methods easily allow users to monitor whether rehabilitated areas have improved, degraded, or remained the same.

“The ability to capture the images with one sensor and one time stamp dramatically reduces the project time and cost. Given the extremely remote regions where the mines are located and the mosaic nature of the areas that need to be surveyed, high-resolution satellite imagery delivers the cost-effective, highly-accurate scalable solution mining companies have been seeking for years.”

JAUREZ DORFLING, TECHNICAL DIRECTOR FOR GEO DATA DESIGN

INDUSTRIES

- » Mining
- » Health & Safety
- » Environmental Services
- » Government

USES

- » Mapping
- » Feature Extraction
- » Change Detection
- » Monitoring
- » Land Classification

Challenge

Create high-resolution change-detection maps of small, geographically distinct, non-contiguous land parcels to repeatedly monitor the rehabilitation and restoration of decommissioned gold mines in Namibia.

Solution

DigitalGlobe high-resolution imagery, collected twice each year, allows users to monitor whether rehabilitated areas have improved, degraded or remained the same.

Results

AngloGold Ashanti has a scalable, cost-effective, qualitative and continuous way to monitor rehabilitation progress of decommissioned mining sites to satisfy reporting requirements.



www.datadesign.co.za



www.anglogold.com

CS-NAMBMINE 08/13