

# How Worldsensing cut tailings dam monitoring costs in Mozambique

**Country**

Mozambique

**Project type:**Tailings dam  
monitoring**Sector:**

Mining

**Main product:**

Monitoring solution

## Challenge

A mining multinational was looking to optimize the monitoring of a tailings storage facility (TSF) at a coal mine in Mozambique. Working with Worldsensing Partner 3Geo Tecnologia, the monitoring solution needed to cover two tailings dams, situated at a distance of up to 2 km/1.2 miles away from a site office.

The intention was to locate sensors on the north and south perimeters of the dams. Complicating the setup, the line of sight between the dams and the site office was obscured by mountains. The key challenge in this project was how to deploy the equipment in the simplest and most cost-effective way.

## Solution

The mining company had originally looked at a proposal involving five gateway stations around the dams, each with its own radio mast and power supply, plus a gateway at the weather station and another at the site office. Thanks to using Worldsensing LoRa long-range, low-power wireless technology, 3Geo were able to cut this down to just two gateways, each with a communication range of up to 2 km.

The team was also able to connect the weather station directly with the monitoring infrastructure, using digital loggers. They also automated 2 in-place inclinometers, one with 30 and the other with 50 sensors connected. Overall, 62 vibrating wire piezometers were digitized as well as 12 flow meters and 1 piezoresistive sensor for reading the reservoir level. Installation was a simple matter since the Loadsensing solution is fully compatible with all of the sensors being used at the site.

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"An important thing to highlight was the concrete anti-vandalism protection used to guarantee the safety of the equipment. Even with this protection, the system managed to transmit to the gateway more than 2 kilometers away."

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**Rodrigo Raposo,**

Geotechnical Engineer, D.Sc and Consultant, RD&I  
3Geo Tecnologia

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## Benefits

Reducing the number of needed gateways not only had a significant impact on the direct costs of the project, but also brought down indirect expenses such as the number of labor hours needed for installation, configuration and radio backhaul setup. As a result, the mining company was able to deploy the monitoring equipment needed to improve the safety of the tailings dam in about half the time originally allowed, and with a 30 percent reduction in material plus a 40 percent reduction in work hours.

The compatibility of the Loadsensing solution with all of the other technologies involved in the deployment means the mining firm can access all its tailings dam monitoring data via a single interface. This data can easily be handed on to third-party applications for visualization and analysis. Plus it's a simple task to add more sensors onto the network, if needed.

The Connectivity Management Tool or CMT helped 3geo to simplify the monitoring and management of all the devices deployed. It will also provide the means to send the data gathered to 3rd party software through a FTPS protocol.

## Advantages

- The IoT remote solution features a wide range of sensor integrations enabling the deployment of a single network for almost all monitoring technologies.
- LoRa technology makes it quick and easy to deploy monitoring networks even in built-up areas.
- Long battery life reduces the need for maintenance and costly site visits.