

SUCCESS STORY

# AITIK MINE MONITORS PORE PRESSURES REMOTELY+++ +

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**COUNTRY:**

Sweden

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**SECTOR:**

Mining

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**PROJECT TYPE:**

Underground water table monitoring

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**MAIN PRODUCT:**

Loadsensing | The Wireless Monitoring System

## Challenge

Boliden Aitik, situated outside the town of Gällivare in the very north of Sweden, is Sweden's largest copper mine. Vast quantities of rock are mined and transported around the clock every day at Aitik's open pit. The deposit consists of chalcopyrite and pyrite yielding copper, gold and silver. Pore pressures around the open pit are a crucial parameter for the pumping strategy as well as for the stability of the slopes. Proper dewatering plans of wet production areas in the pit optimize the copper ore extraction processes in the Aitik open pit mine.

In 2010, Boliden Mine started controlling pore-pressures by means of 120 piezometers installed in 40 boreholes in and around the open pit. Initially, the mine obtained the piezometric data manually, but later started using a standalone system to gather data automatically and collect it on a monthly basis. The disadvantage was that mining operations were not updated with the latest information on water behavior in the pit. Boliden, the mine operator, had to rely on monthly feedback, prone to human errors. Manual data gathering in general is time and labor consuming, and implies additional risks for workers' safety.

## Solution

Aitik realized it would be better to use a remotely operated, monitoring system in order to have real-time control over the piezometers. The distances between the boreholes and the vast extension of the open pit combined with vehicle traffic and the changing environment around the pit, made a wireless monitoring system the ideal solution.

In July 2016, the mine implemented a long-range, low-power wireless monitoring system for initially 8 vibrating piezometers. All data is gathered by wireless nodes next to the boreholes, which send information to the mine communication tower, placed 1.4 km away from the furthest borehole. At the communication tower, a gateway receives all data the piezometers generate and transmits it to a server and data management software.

Loadsensing wirelessly monitors pore pressures around Aitik open pit mine, one of the biggest in the world. The wireless monitoring system provides information for appropriate dewatering plans within wet production areas, so copper ore extraction processes can be optimized.

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## Facts & Figures

- 60 VW multi - level RST piezometers on the surroundings of the pit
- Various piezometers in each borehole
- Immediate detection of any risk
- 60 VW 5 channel Loadsensing wireless data nodes
- 4 Loadsensing gateways

Until today, Boliden has installed 41 Loadsensing wireless data units which monitor 24/7 pore water pressure measured by the piezometers, sending data automatically and wirelessly to the Loadsensing Software Suite every hour. Pore water pressure can be easily surveyed in real-time via a web browser. The whole system of wireless units can be controlled with only one Loadsensing gateway, located on the mine communication tower, placed almost 1 mile away from the boreholes. The wireless units are securely kept inside wooden boxes at the boreholes around the pit, showing perfect radio communication.

## Benefits

The Loadsensing wireless monitoring system enables automatic and remote data gathering on a daily basis, improving the information quality and frequency to Boliden, who can optimize copper production. In addition, there is no need for manual operation, saving labor time and creating a safer mining environment. The Loadsensing system was selected due to its long-range radio, low-power consumption, easy implementation and strong worldwide references. Its robust design is engineered for working under tough conditions in the most challenging environments which makes it a perfect fit for Aitik open pit mine.



*Figure 1:*  
*Open pit of Boliden Aitik, Sweden's largest copper mine*



*Figure 2:*  
*Loadsensing VW 5 channel data node*



Find out more:

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