

# Sealing Layer Installations for Mine Waste

SO-110 Oxygen Sensors



## Introduction:

Large amounts of mining waste are produced in Sweden, and it can produce harmful chemicals when exposed to water, oxygen, or oxidizing bacteria. A dry cover solution consisting of a sealing and protective layer are used to stop sulfide oxidation. While the sealing layer is typically made of clay, clay availability is limited, and other alternatives are needed. In this study, the researchers tested two non-hazardous industrial wastes, green liquor dregs (GLD) and bentonite, as an effective sealing layer for mine waste, as well as two methods of installation: observation wells and pits.

## Set Up:

The researchers set up observation wells and a pit containing both a GLD- and bentonite-amended till. The sealing layers were made of two different materials, a mixture of till and 10 wt.% of GLD, and a mixture of till and 4 wt.% of bentonite. A protection layer of silty till was placed over both sealing layers. Eight Apogee oxygen sensors were placed horizontally below and on top of the sealing layer. Other probes were installed by drilling holes into the observation wells.

## Results:

While the observation wells and pit were useful for the study, there were some issues that occurred. It was difficult to properly seal the drill holes after installing the probes in observation wells. The researchers used foam insulation and silicon to seal the holes to avoid oxygen diffusion in the wells. Another possible downside of a monitoring well is that it can act as a pathway of water and oxygen through the dry cover to the mine waste. They also found that pits are cheaper, as the only cost comes from using an excavator.

## Conclusion:

Installation of instruments in a sealing layer should involve excavating a pit in the protective layer after the soil cover is installed and then drilling the probes into the sealing layer. The pit would then be backfilled, with the cables leading to the surface where the data logger is installed.

## Application Summary

### Summary:

Using Apogee oxygen sensors, researchers evaluated using industrial wastes to seal mining waste using observation wells and pits.

### Apogee Product Used:

SO-110 Oxygen Sensors

### Location:

Näsliden Mine, Sweden

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### Reference Article:

Instrumentation of Sealing Layers Made of Two Different Amendments (Green Liquor Dregs and Bentonite) to Till for Reclamation of Sulfidic Mine Waste