

## Case Study

# Adjusting Covers for Climate Change

## Phosphate Mine, Idaho, USA

### > Background

Okane was engaged to design a cover system to support an Environmental Impact Statement (EIS) update as part of a mine site expansion at a phosphate mine in Idaho. The objective of the cover system was to limit net percolation to minimize the transport of selenium. After three years of monitoring performance with a large-scale lysimeter, it was observed that actual site-specific conditions during winter were significantly warmer than the 100-year climate record which was the design basis of the cover system. The winter snowpack slowly melted, releasing infiltration, and reducing cover system storage capacity January through March.

### > Approach

Okane worked with the site to refine and modify the cover system to manage the greater than anticipated infiltration, moving from a store and release design to one that could manage inevitable infiltration. The revised system consists of two low-permeability layers of screened and compacted overburden at the base, with one of the layers also amended with bentonite. A drainage layer of coarse rock removes the vast majority of infiltration as lateral interflow. Growth medium and topsoil above the drainage layer provides for a vegetation medium. A second large-scale lysimeter with the extensive water balance monitoring system was also constructed to demonstrate performance of the revised cover system.

### > Client Benefit

The revised cover system continues to perform as designed and following regulatory review (US Bureau of Land Management, US Forest Service, and Idaho DEQ) is now the approved cover system for the mine expansion area.

**An adaptive cover system design to meet changing site conditions.**

Integrated Mine Closure  
and Relinquishment Solutions



Construction of large-scale (20 m x 10 m) lysimeter on 3:1 slope.

