

Case Study

Monitoring Cover Systems in Permafrost Regions

**Public Works and Government Services Canada
Tundra Mine, NT, Canada**

> Background

The Tundra Mine is a former underground gold mine located 240km Northeast of Yellowknife where permafrost is expected to return to disturbed areas hampering the functionality of some instrumentation types. It's conventionally placed tailings containment area (TCA) and waste rock dumps required remediation.

> Approach

Okane focused on the specific site challenges to identify the optimum analyses and activities prior to construction. Okane evaluated three cover system options to minimize acid mine drainage (AMD) from the waste rock and tailings, as well as for the long-term monitoring of the landform structures.

> Client Benefit

Applying a risk-based approach resulted in the selection of a combination granular soil/geosynthetic liner cover system. A detailed monitoring program including a variety of instrumentation (thermistors, vibrating wire piezometers, monitoring wells) was designed and installed to monitor the long-term performance of the cover system and to monitor progression of the expected return of permafrost.

“Monitoring long term conditions in permafrost region after the implementation of site remediation to assure environmental objectives are met.”

**Integrated Mine Closure
and Relinquishment Solutions**



(2014). Tundra Mine. Government of Canada.

