

Client:

Suncor Energy

Location:

Fort McMurray, AB

Services Provided:

- Field investigations and laboratory testing
- Corrosion monitoring
- Forensic engineering
- Reliability analyses
- Remedial design
- Active Risk Management™

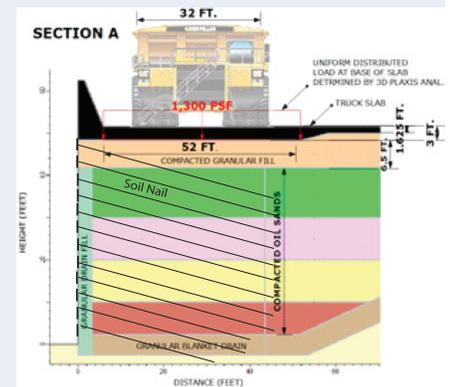
Value Provided:

- Predict remaining wall service life
- Prepare remediation design and contract documents
- Prepare and implement risk management plan

Background & Project Challenges

The Mechanically Stabilized Earth (MSE) walls at Ore Processing Plant (OPP) 85 at the Suncor Energy oil sands facility in Ft. McMurray, Alberta, are a critical first link in the oil extraction process. Ore is hauled from the open pit mining operations and dumped into hopper/crushers at the top of the walls and then transferred via conveyor belts to the oil extraction facilities. The three separate plant walls are approximately 50 ft. high, and were constructed using non-galvanized steel welded wire mats for soil reinforcement. The walls were designed in 2000 for an expected service life, at that time, of 10 years.

In 2009, the south wing wall section of Wall A (shown in the photo) failed without any warning signs. Similar failures of the south and north wing wall of Walls B and A, respectively, occurred in 2012. In all cases, evidence of corrosion of the metallic soil reinforcements was observed, which raised concern regarding the integrity and safety of the main plant walls.



Geocomp Role & Accomplishments

Geocomp was retained in fall 2009 to determine both the impact of corrosion of the steel reinforcements on the service life of the MSE structures and the risk of wall failure. A series of field and laboratory investigations were conducted to determine electrochemical characteristics and engineering properties of compacted lean oil sands which were used for the reinforced fill. Corrosion-monitoring stations were also established as part of a risk management plan, and consisted of installing polarization rods into the wall faces at various locations. The corrosion rate of the rods was then measured over time using the Linear Polarization Resistance (LPR) electro-chemical technique. These measurements allowed determination of real time corrosion rates within the walls.

This provided data with which to perform reliability analyses and predict remaining service life of each wall. As a result, remediation was recommended to extend the operational life of all walls to meet Suncor goals.

Geocomp recommended a unique soil nail remediation concept that would retain the existing wall face and permit plant operations to continue during remedial construction. We performed a reliability based design of the system and prepared plans and specifications. The first phase of remedial construction was completed in 2013.