Restoring the Former New Calumet Mine

The New Calumet Mine in Québec, Canada, was a lead, gold, zinc and silver mine which was partially decommissioned in the 1970's.

Location

- QUEBEC, CANADA

Client

- MINISTÈRE DE L'ÉNERGIE ET DES RESSOURCES NATURELLES DU QUÉBEC

Project Status

- COMPLETE

The incomplete site closure and restoration left the site with unstable infrastructure, an uncovered tailings area including a dam, and uncovered mine tailings residue, causing a risk to the local environment and communities. Disused tailing ponds and waste rock were also a potential risk to surface water and groundwater. The client, Ministère de l'Énergie et des Ressources Naturelles du Québec, wanted to rehabilitate the site and reclaim disused land to restore the site and reduce the environmental risk while improving the aesthetics and the natural environment.

What future trends did we include?

- Increasing societal value of accessible and healthy natural spaces within the natural environment.
- A changing climate, with heavier and longer rainfall events and rising summer temperatures altering the risk of mobility and toxicity of pollutants.
- Biodiversity risk: enhancing biodiversity assets and reducing potential for pollution.

How were they considered?

WSP acted as the prime consultant to ensure the rehabilitation was done in a manner that was sensitive to the local environment, land owner and adjacent neighbours.

Tailing sites were reprofiled and resurfaced and a GCL membrane placed at the surface of two of three tailings ponds to reduce water and oxygen infiltration – this minimizes the risk of contaminants spreading to surface water and ground water and potential acid generation. A third tailings area was covered with an engineered cover with capillarity effect barrier to maintain residues saturated.

Our solution preserved and improved the quality of marshland running through the site. To make the best use of existing resources, the dam was stabilized and other infrastructure that was demolished provided crushed concrete that was used as backfill.

How was our approach better?

Our designs reflect innovative solutions to rehabilitating and restoring old mine sites. More importantly, the design preserved and enhanced current ongoing natural recovery while providing technical engineered support in other areas where intervention was required to restore the site to a more natural condition.

The outcome

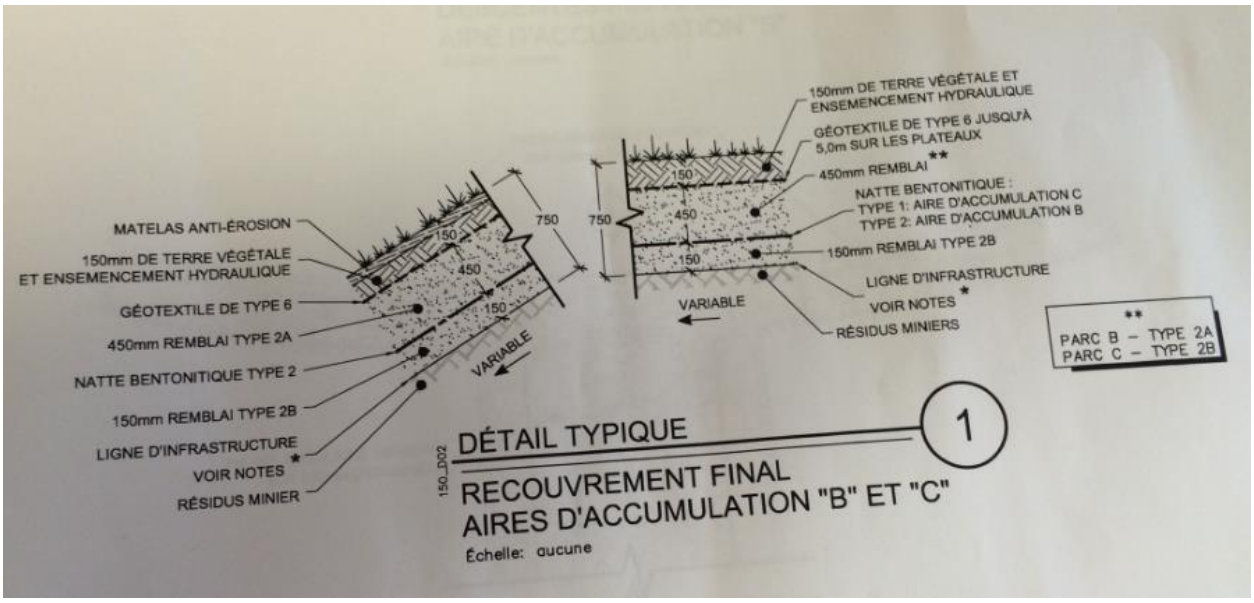
The site was rehabilitated and restored to a site that allows the natural environment to flourish, whilst also bringing the land to a condition that allows use for future purposes. Finally, the project achieved the following:

- Not a single Lost Time Injury during the project;
- Final result was in compliance with Québec environmental regulations and certificate of authorization;
- 600 m^3 of crushed concrete reused as backfill material;
- All steel extracted during the demolition works recycled by the construction contractor.

Above information from WSP website Restoring the Former New Calumet Mine | WSP
wsp.com/en-ca/projects/restoring-the-former-new-calumet-mine

Bentofix SRNW was used and deployed on the slopes of this site. Pictures taken during the Fall of 2016. SRNW is a double nonwoven scrim-reinforced GCL – our most robust and weather resistant GCL.

Coversoil placement over the GCL.



Typical Cross-Section.
Type 1 GCL: Bentofix NS – nonwoven top fabric / woven bottom fabric.
Type 2 GCL: SRNW – nonwoven top fabric / scrim-nonwoven bottom fabric. (scrim=woven).
Both NS and SRNW contain 4.34 kg/sqm of dry bentonite (@0% moisture content).

Coversoil placement over the GCL & a drainage collection pipe with sock.

Picture courtesy of WSP website. Site overview.

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GCL deployment in 2016.
Project completed in 2017 / final restoration works.