Former Tipple Mine Site Remediation and Reclamation Program

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Presentation Overview

- Site Background & History
- Project History & Development
- Remediation & Reclamation Plans
- Public Consultation Activity
- Photos
- Project Outcomes
Site Location
Site History

- Tipple for underground coal mine from ’40s until late ’70s.
- Physical separation process; product coal separated from waste rock.
- Produced coke and briquettes as a sideline in the ’60s.
- Coal tar from coking operation disposed to pits.
- Site dismantled and surface re-contoured (including dispersal of pits) in 1979.
- Area re-developed to high end residential from late ’80s to current.
Operating Site - 1967
Project History and Development

- Coal tars discovered at depth during a sewer line installation in 1998.
- A series of eight intrusive investigations and assessments were completed between 1998 and 2005, all undertaken in consultation with Alberta Environment.
- AMEC contracted by McDermott International, the company that holds responsibility for some of the legacies at the site.
Project Objectives

- Address the materials on-site that were a legacy of the former processing operations.
- Re-establish a vegetative cover consistent with the site’s use as a wildlife corridor.
Remediation Plan

The remediation plan involved managing the coal tars by:

– Removing contaminated sediments that were present in the Bow River channel immediately adjacent the site;

– Constructing a subsurface barrier that would separate the on-shore tars from the local river ecosystem;

– Placing bank erosion protection works over the portion of the barrier running along the river’s edge; and

– Installing a groundwater testing system that would monitor the performance of the subsurface barrier.
Subsurface Barrier
Groundwater Modeling Outputs

McDermott International

SIMULATED CONCENTRATION DISTRIBUTIONS
COMPARISON OF NATURAL CONDITION AND THREE SIDED WALL CONTAINMENT
Soil Bentonite Slurry Wall

- Max depth below working bench – 13m.
- Max depth below final grade – approx 20m.
- Specified mix utilized river gravels, imported granular materials and imported fines.
- Minimum bentonite content – 1.5%.
- Minimum fines content – 15%.
- As-built permeability - 1x10-6 cm/sec w/ FoS of 10.
Reclamation Plan

Guided by the requirements of a Conservation Easement that applies to the property. The reclamation plan involved:

– Importing the subsoil and topsoil required to support a vegetative cover on the property;

– Re-vegetating the surface with spruce and aspen seedlings and native grass species.
Revegetation Plan

Notes:
1. All planted areas to be covered with 20cm of imported subsoil and 10cm imported topsoil prior to revegetation.
2. All revegetated areas to be planted to native grass species.
3. High density seeding areas to be planted with 150 stems in landscape - 5120 white spruce, 5500 white spruce seedlings and 600 trembling aspen seedlings.

Legend:
- Reclamation Boundary
- High Density Seeding Areas (eventual sodding cover)
- Native Grass Species

Surface Areas
- Area within reclamation boundary = 89.855ha
- Revegetated area (green areas) = 54.327ha

Areas:
- 1 = 18.330ha
- 2 = 15.0ha
- 3 = 13.0ha
- 4 = 62.0ha

Slurry Wall

No planting areas near roads, powerlines, escarpments.
General Site Perspective Following Reclamation

Former Tipple Mine Site
Consultation Activity

- Meetings with institutional stakeholders.
- Information packages sent to property owners.
- Inquiries and concerns from residents addressed via personal visits, telephone and/or email responses.
- Project website established with a feedback mechanism (i.e. on-line survey).
- Presentation made to the Canmore Town Council.
- Public Open House; and
- Public input during construction via website, toll-free number and email.
Pre - Construction (2007)
Construction (Aug 2007)
Construction (Sept 2007)
Construction (Sept 2007)
Construction (Sept 2007)
Construction (Sept 2007)
Construction (Sept 2007)
Habitat Replacement
Post - Construction (Sept 2009)
Post - Construction (Sept 2009)
Project Outcomes

- Risks mitigated without intrusive & costly removal exercise.
- Passive, low maintenance structure with no operating costs (beyond performance monitoring).
- Land use not compromised.
- Adjacent property values maintained.
- Satisfied regulators.
- Satisfied public.
Questions?