A Landfill Alternative The Highland Valley project

Aproposed bioreactor landfill with environmental benefits at the Highland Valley copper mine site in B. C.'s Interior, could save Metro Vancouver $3 billion in waste management costs over its lifetime, according to Tony Sperling, Ph. D; P. Eng, President of Sperling Hansen Associates Inc.

As Metro Vancouver finalizes its Solid Waste Management Plan (SWMP), Sperling says the landfill that he has championed since 2001 would operate to the highest environmental standards and also generate far fewer greenhouse gas emissions (GHG) than incinerators -- an option favored by the region. The Logan Lake mine is owned by Teck Cominco Corporation and is expected to close in 2019. The mine and landfill would operate concurrently until that date.

The Highland Valley Centre for Sustainable Waste Management (HVCSWM) project has been undergoing provincial Environmental Assessment (EA) since June, 2005, at a cost to date of $2 million. The project team hopes to obtain certification this summer. Construction would be completed by the fall of 2009 and the landfill would be ready to receive garbage by the spring of 2010 when the Cache Creek landfill is due to close.

Metro Vancouver voted on March 28, 2008, to recommend to the provincial government the short-term export of waste to Washington State landfill until it decides which waste-to-energy facilities in the Lower Mainland to use. However, Marvin Hunt, Chair of the region's Waste Management Committee said, "There is a great reticence to going down the road to exporting waste. Our committee has not closed the door on anything."

Sperling had asked the region to use his made-in-BC solution instead, estimating this would save $7 million in annual disposal costs over the U. S. export option. Furthermore, about $28 million in spin-off benefits would stay in B. C.

The HVCSWM project's capacity would be 600,000 tonnes per year with a maximum capacity of 55 million tonnes over an estimated 90 year lifespan. The total lifecycle costs have been estimated at $56 per tonne, including transfer station operation, compared to $66 per tonne for Washington State's Rabanco,

Photos In This Story

"Fewer than 40 trucks would backhaul wood chips from the Interior landfill site to the Lower Mainland."

Full caption and actual photo size

Green circle shows location of landfill above tailings pond.

Full caption and actual photo size

based on their recent Request for Expressions of Interest to the region.

The Highland Valley landfill location and design offer significant environmental advantages over existing landfills. The 140 hectare project would be located on the mine's rock waste dump, eliminating the need to find and clear cut a new area. The project would retain skilled jobs at the site after the mine closure. Building on top of disused brownfields has already proven successful at the Gibraltar Mine in B. C.'s Cariboo Regional District where Sperling Hansen Associates designed Canada's first solid waste facility of this type in 2001.

The EA has established that with a triple liner system, a water table depth of 90 meters beneath the base of the landfill, and at least 100 years of hydraulic containment provided by the valley pit as it floods once mining activity stops in 2019, there is no risk to groundwater supplies.

Bioreactor

As a bioreactor, the landfill would be the first in North America to operate with intermediate cover biocaps, which promote the growth of methanotrophic bacteria to convert methane to carbon dioxide. The biocap bacteria are so efficient they could reduce potential GHG emissions from 93,000 to 30,000 tonnes, says Sperling. The biocap layers would be placed at five-metre intervals to a height of 75 metres. To date, biocaps have only been used in landfill research projects and final cover applications.

In addition, Highland Valley's dry climate would produce significantly less leachate than Lower Mainland landfills. Highland Valley receives only 390 mm of precipitation compared to more than 1000 mm on the coast.

A triple liner system -- a first for B. C. -- would further improve leachate containment. This would include compacted clay, a bentonite clay liner and a primary high density polyethylene geomembrane liner. Sperling points out that many conventional landfills in BC have no liners at all.

Over 100 trucks already use the same routes to bring wood chips from Interior sawmills to Lower Mainland pulp mills, returning to the Interior empty. The landfill operation would require fewer than 40 trucks which would haul garbage to the mine site and then backhaul wood chips from the Interior to the Lower Mainland. The resulting savings to the forest industry would be $9 million annually.

Local support

The project needs the support of HVC, Logan Lake community and local First Nations bands to proceed, says Freberg. "Certainly HVC remains convinced that it is a good idea, our solid impressions are that Logan Lake agrees and I think local First Nations are coming to share that view," says Freberg. Of the 18 First Nations bands involved, only one has expressed significant opposition to Metro Vancouver.

With 25 per cent of the mine's 1055 employees living in Logan Lake, earning an average income of $100,000, Mayor Ella Brown acknowledges that the closure of the mine will have a significant impact on her community of 2300. Conversely, the launch of the landfill project would encourage more young families to move in, she says. The majority of residents favor the landfill, she says.

Lois Jackson, Chair of the Metro Vancouver board assured the March 28 meeting that the board would still consider an Interior landfill proposal if it received endorsement from all of the First Nations bands affected and approval from the Minister of the Environment.

Sperling was reassured to hear that Metro Vancouver is still willing to consider a made-in- BC solution.

"Highland Valley's EA process is continuing to move forward and I am optimistic that it will meet the necessary requirements," he says.

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