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# THE CRYSTAL MOOSE NEWS

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**Dr. Tony Sperling, Editor**

**Greetings** and welcome to our semi-annual Newsletter. As we work through the 2005 construction year I fondly look back to the summer of 2004 as the busiest ever with major construction projects on the go at Nanaimo Regional Landfill, Hartland Landfill, Mission Landfill (2 projects) and Eurocan Pulp Mill with a combined construction value of \$8 million. I wish to thank the contractors involved on the projects, particularly JJM Construction (Nanaimo Geogrid Berm), Hazco (Mission Liner Expansion) and Quantum (Hartland Interim Cover) for their creativity and willingness to work with SHA's engineering team to make design adjustments that resulted in the very best end products possible.

This summer marks SHA's 10<sup>th</sup> Anniversary, an accomplishment for which I am extremely proud. Over the years I have obtained tremendous satisfaction from seeing our design visions turned to reality. Projects that stand out in my mind include the Vertical Expansion of Vancouver Landfill that will provide a low cost and environmentally secure landfill for waste generated in the Lower Mainland for the next 40 years. At Hartland a large rock quarry has revolutionized operations. Rock is being quarried to produce operational cover and more importantly, to produce additional air space. At the Regional District of Nanaimo Landfill a Geogrid Reinforced Berm has the potential to extend the lifespan to 2028, saving the RDN approximately \$2.7 million per year in off-island export fees.

As well, I marvel at some of the little things that can be done to improve the environment. At 3<sup>rd</sup> Street Landfill SHA worked with the District of West Vancouver to divert a leachate seep that was entering the Capilano River into the

GVRD sewer. In 1997 SHA worked with engineers from Kerr Wood Leidal at Premier Street Landfill to divert storm water away from the leachate collection systems. This prevented leachate overflows into Lynn Creek. Today, nature has taken one extra step; a vibrant wetland now teems with life in a rip rap armoured sedimentation pond (see pictures below).

I believe that tremendous opportunities exist for improving the way we design landfills by incorporating vegetation. Working with nature will help improve the environment through increased sedimentation, evaporation, even metal uptake. Also, I believe that we should strive to create vibrant ecosystems on top of our landfills upon closure, instead of grass meadows. Undoubtedly, this is a new direction that future closure designs are going to take.

## Highland Valley Centre for Sustainable Solid Waste Management

### By Dr. Tony Sperling:

Many of you are aware that SHA is working with Teck Cominco to develop a Regional Landfill Facility for Southwest British Columbia on top of a waste rock plateau at the Highland Valley Copper Mine. The mine site presents the very best location that I have come across to date for a large tonnage regional landfill facility. Our vision is that the landfill will provide a secure long term facility for all interested regional districts and municipalities in Southwest British Columbia to direct their solid waste once existing facilities reach capacity or once proper operation of existing small tonnage facilities proves more costly than export. As has been successfully demonstrated by Rabanco Landfill in Washington State and Roosevelt Landfill in Oregon, large regional landfills result in an economy of scale that allows the landfill owners to justify environmental protective measures such as triple liner systems, gas collection, leachate treatment, even energy utilization, systems that are often far too expensive to



**Rip Rap armoured Sedimentation Pond as Engineered by SHA at Inter River Park.**



**Same Sedimentation Pond. Design enhanced by Mother Nature.**

contemplate at small landfill facilities that receive less than 50,000 tonnes per year.

Many of you are probably concerned that trucking waste over 300 km to a brownfield mine site in the interior will result in considerable diesel exhaust emissions that will contribute to global warming. To minimize that impact, the project team is working with B.C. sawmills and transport companies to develop backhaul opportunities for wood chips that are required by coastal pulp mills. The projected net result is that only a small incremental increase in CO<sub>2</sub> emissions will be generated, compared to having the trucks return to the mills without a garbage back haul.

To minimize environmental impacts our vision is to operate the Highland Valley facility as a bioreactor that will be constructed in a way that will maximize methane production and recovery. Preliminary analyses suggest that up to 14,000 tonnes of methane will be captured and utilized at the facility per year, resulting in a reduction of green house gas emissions equivalent to 300,000 tonnes per year of CO<sub>2</sub>. This reduction will be equivalent to getting 70,000 cars off the road. In addition, the facility will be able to produce about 8 megawatts of power.

You may be concerned that once established as a monopoly, a private for profit landfill would eventually increase tipping fees, holding waste generators ransom. That is not the vision of Teck Cominco, nor that of SHA. We are looking to develop an operating arrangement that will give the GVRD and all other interested participants economic certainty and an opportunity to share in the cost savings and environmental benefits that will be generated at this ideally sited regional facility through economies of scale and an abundance of construction material resources.

Teck Cominco, a world leader in metal production shares my vision of a first class facility at the mine site. For them the project makes sense because the landfill can provide economic activity in the region once the mine, a major economic engine in the area since 1963, closes some time between 2009 and 2013, resulting in a loss of more than 900 jobs.

Making the landfill a reality will take a lot of hard work by a lot of dedicated people. Foremost, we will have to work with Local First Nations to ensure that their concerns about environmental protection are fully addressed. Also, Logan Lake will experience increased truck traffic. Noise and safety concerns will have to be managed. Work is ongoing with the community to develop an acceptable solution.

Notwithstanding, the Highland Valley project is about sustainability and about minimizing waste management costs for all interested regional districts in Southwest British Columbia. By utilizing a 100 ha brownfield site on top of a large waste rock dump, disturbance to large tracts of unspoiled greenfields can be avoided. This goal is consistent with the recent Brownfields initiative of the Federal Green Enabling Fund that has recently been allocated \$300 million to encourage revitalization of brown field sites.



**Proposed Landfill Site at Highland Valley Copper**

By locating the facility 19 km from the nearest town and installing the best available environmental controls including a triple liner, a leachate recirculation system and horizontal landfill gas collectors the undesirable impacts often associated with landfills will be avoided at this facility.

The project is about working with First Nations and local communities in a proactive manner to provide real business and employment opportunities. Using existing infrastructure at the mine, our goal is to leverage the available resources and energy that will be provided by the landfill gas to attract other spin-off business activities at the site.

The project has recently been authorized to enter the comprehensive Environmental Assessment Process. Over the next 12 to 18 months all concerned stake holders will be encouraged to learn about the project and to provide their comments for consideration.

I am hopeful that at the end of the day the Environmental Assessment as well as updates to the GVRD and TNRD Solid Waste Management Plans that are currently being undertaken will show that the Highland Valley Landfill project will provide the most responsible way to manage solid waste that is currently accepted at the Cache Creek Landfill (due to close in 2008) and from other municipal facilities that will close in the future as available capacity is exhausted.

A new web site is being created where additional information on the project will be provided. The web site will be operational in a couple of weeks. We will contact you with the URL address once the site is operational.

All suggestions on how our vision of a regional facility can be structured to best serve British Columbia would be greatly appreciated. Please contact me at [sperling@sperlinghansen.com](mailto:sperling@sperlinghansen.com) with your suggestions.

**Geogrid Berm Expansion at Nanaimo Landfill**

By Sharon Tenenbaum



During the 2004 construction season SHA worked closely with JJM Construction Ltd. and the Regional District of Nanaimo to construct a large Geogrid reinforced berm to support a major expansion at Nanaimo Regional Landfill. The project, the first of its

kind in B.C., involved constructing a 350 m long, 10 m high Geogrid reinforced wall on the south side of the landfill.

The expansion area was lined with a state-of-the-art double liner comprised of a 60 mil aggressively textured HDPE membrane over a specially reinforced Geosynthetic Clay Liner that was deployed on 2H:1V side slopes. Ensuring stability of the overlying leachate collection layers was a particular challenge that was successfully overcome with the addition of mid-slope benching. A full scale test pad was constructed to confirm stability of the liner system.



**Test pad under full equipment load.**

In total, the berm required 75,000 m<sup>3</sup> of fill. To reduce cost and to create additional air space for future material most of the rock required for the project was quarried right on site by Pacific Blasting and JJM.



**Geogrid Reinforced Berm under construction.**

At \$3.4 million, Phase 1 of the two phase Geogrid Berm project will provide 325,000 m<sup>3</sup> of additional landfill capacity for the District of Nanaimo, enough to extend landfill operations by seven years, allowing the RDN to obtain the maximum benefit from their investment in existing landfill infrastructure.

**REGIONAL PROJECTS**

By Todd Baker



The following paragraphs provide highlights of a number of exciting projects that our staff have been involved in over the past year and other news from landfills around the province.

**Mission:** The District of Mission recently commenced landfilling in a double lined expansion area engineered by SHA at its Minnies Pit Landfill. The expansion area was a site of a former gravel pit. To allow a liner to be deployed pit walls had to be flattened to a 2.5H:1V slope. This allowed a further 50,000 m<sup>3</sup> of gravel to be extracted.

Progressive closure of a 2 ha area using a linear low density polyethylene liner was completed in late 2004. Mission is now looking to upgrade the leachate treatment facility, including the addition of a second aeration treatment pond and a sedimentation lagoon.

**Gibraltar:** Phase I of the Gibraltar Landfill commenced operations in November 2003 on top of Gibraltar Mine's waste rock dump. The Phase II expansion area is being prepared this summer with a double liner and leachate collection system.

**Hope:** Expansion of the Hope liner is scheduled for October, 2005 after the scale facility is relocated. A large volume of cover soil will be extracted from beneath the scale and stockpiled for future use.

**Squamish:** A comprehensive study has been launched to assess the feasibility of expanding the existing Squamish Landfill into a regional facility for the entire Sea-to-Sky Corridor. Carney's in-vessel composting facility is in full production, with large volumes of soil being generated for landscaping projects in Squamish and Whistler.

**Whistler:** The forested area immediately next to the Whistler Landfill has been selected as the best location for the Athletes Village and future staff housing. As a result, the Whistler Landfill will close this October so that the facility can be properly capped and landscaped in 2007 and 2008. End uses being contemplated for the landfill include sports fields and recreational green space.

**Skimikin:** The Columbia Shuswap Regional District is closing the Skimikin landfill because capacity at the site has been exhausted. The 4 ha site is being capped with an LLDPE geomembrane, a gravel drainage layer and fabricated top soil that was produced from on-site sand, saw dust from a local mill and biosolids contributed by the GVRD. A new transfer station is also under construction at the site.

**Vancouver:** City of Vancouver is initiating a major redevelopment project that will improve traffic flow at the busiest landfill in British Columbia. Planned upgrades will include new scales and a completely redesigned residential drop-off facility. The first of nine progressive closure projects, final capping of Phase 1 will likely be initiated during the summer construction season of 2007.

**Hartland:** Congratulations to CRD Landfill staff for being awarded the prestigious Silver Award of Excellence for Landfill Management from SWANA. SHA is currently working with CRD Engineering Department on a long term Operating Plan that will integrate phasing, quarry development, leachate control and progressive closure.

### **The Sixth Annual Indian Arm Thigh Burner**

**By Dr. Tony Sperling**

After a setback last year due to inclement weather the sixth annual Indian River Thigh Burner will occur on Saturday, September 24<sup>th</sup>, 2005. This year's ride will celebrate SHA's 10<sup>th</sup> anniversary. Besides the traditional salmon barbeque, a special birthday cake will be served.

Those not keen on Mountain biking can arrange to instead paddle to our house on Indian Arm from Deep Cove. More details are provided in the PDF file attached.

Regardless of whether you want to do the full ride, the kayak paddle or just come up on the Drift Buster for the barbeque afterwards, please give David Kvick or Anne Pataky a call or drop them an email to book your spot. The cost of the event is by donation (\$25 to \$50, kayak rentals extra).

Last year I had the special opportunity to join 60 grade 5 kids at Sea-to-Sky Camp as a chaperone. The exposure that kids got to environmental issues, social responsibility and life skills in this four day camp was simply fabulous.



**Grade 5 Students learning about tidal life at Sea to Sky Outdoor School on Keats Island**

In years past all proceeds from the ride have been donated to the Squamish Rotary in memory of Lynda Carney. This year, 50% of the funds raised will be shared with Sea-to-Sky Environmental Camp at Keats Island. Through support of this program, it is my hope that a few more kids will be able to experience and learn that each of us can make a difference. At

SHA we believe in these causes and to celebrate our 10<sup>th</sup> year we will match all donations made. I hope that all of you can join us!!!!

### **SWANA's B.C. Qualified Landfill Operator Course**

Many of you have participated in SHA's Landfill Operator Course over the years. This spring an agreement was reached with the B.C. Pacific SWANA Chapter to take over administration of the course from SHA and to implement a certification component. The result is the new B.C. Qualified Landfill Operator Program. Certificates were issued to participants who successfully completed the qualifying exam in Kelowna in 2003 and in Richmond in 2004.

This spring the course was updated, with new sections added by Colin Wong, Stuart Somerville, Jim Martin and Paul Henderson. The inaugural course was put on in June at a fabulous facility in the Prince George Civic Centre. Even better than the spacious bright room was the excellent food and service provided by the staff. Without a doubt, the course will return to Prince George!!

The B.C. SWANA Chapter has been invited to teach the course again this November in Whitehorse, Yukon. Paul Henderson from the City of Vancouver and Tony Sperling will share the teaching.

### **ACCOMPLISHMENTS BY STAFF:**

David Kvick continues to excel in mountain biking and cross country skiing. After winning the Cariboo Marathon ski race last year and becoming B.C. Champion in mountain biking, David won a Mountain Biking Gold Medal in the World Master's Games in Edmonton. He and his partner James Shellard followed that Victory up with another win in the Trans Rockies Challenge, a gruelling seven day race from Fernie to Canmore. James rode the last three days with a broken collar bone.

Nathalie Maurer, our newest staff addition continues to set her sights on participating in the 2008 Olympics on Canada's rowing team. Despite being a few seconds short of making the team this year she plans to work even harder to earn her place on the team in 2005.

### **DON'T MISS:**

- 6<sup>th</sup> Annual Indian River Thigh Burner, Sept. 24<sup>th</sup>, 2005.
- The 2005 Southern Interior Waste Managers Conference, Nelson, Sept. 29-30.
- Canadian Waste and Recycling Expo, Vancouver, B.C. October 26<sup>th</sup> to 27<sup>th</sup>. Special SWANA Session on E-Waste.
- SWANA MOLO Course, Richmond B.C. April 3 to 6, 2006.
- SWANA 21<sup>st</sup> Annual Northwest Regional Symposium, Richmond, B.C., April 5 to 7, 2006.