MINING LTD. MYRA FALLS OPERATIONS



Managing 3 meters of Rainfall per year

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Myra Falls Operations

- Underground base metal mine producing zinc and copper concentrates with gold and silver credits.
- Accessed by a 90 km asphalt road from Campbell River
- In operation since 1966 (prospecting dates back to 1864)
- Mined 26 million tonnes
- Employs 469 people
- Unique setting located within a Provincial Park
- Footprint of 220 ha within the 3300 ha Strathcona-Westmin (Class B) Provincial Park.



Strathcona Provincial Park Rugged Mountain Wilderness Area



Mine Site Overview and Topography



Collection and Treatment of Mine Drainage Inputs

- Historic waste rock dumps
- Tailings disposal facility(ies)
- Dormant/exhausted mines Lynx and Myra, both open pit and underground
- Active underground mines HW and Phillips Reach
- Mill complex and Paste Plant
- Camp and administration buildings
- Surface runoff

Lynx Underground Mine input



HW Mine and Myra Mine input



Surface runoff capture



Waste rock dumps and Tailings Facility



Tailings Facility decant



New Pump House



Water Treatment System

- Collection, discharge and mixing of all inputs upstream of the primary water treatment pond - Superpond
- Lime addition / pH adjustment at the head of the Superpond to precipitate metal hydroxides
- Six downstream settling ponds

Mixing of collected inputs



Water Treatment System



Water Treatment System 2006

Pre-treatment vs. Post-treatment – in mg/L								
MIX TANKS								
	pH unit	TSS	T- Zn	T - Cu	T - Pb	T - Cd		
Mean	7.17	136.5	6.96	2.99	0.212	0.046		
Range	5.8 - 11.5	6.3 - 998	0.0 - 16.2	0.3 - 74.7	0.1 - 0.76	0.0 - 0.089		
EFFLUENT								
	pH unit	TSS	T- Zn	T - Cu	T - Pb	T - Cd		
Mean	8.87	5.52	0.23	0.024	0.0026	0.007		
Range	7.7 - 9.49	3 - 10.9	0.023 - 0.973	0.0041 - 0.0794	0.0006 - 0.0089	0.0003 - 0.239		

Challenges

- Geography steep slopes, fast runoff, limited diversion options, small footprint
- Changing weather patterns greater extremes, more precipitation
- Cyclical nature of mining with changes in
 - Tailings disposal strategy
 - Regulations and permits
 - Mining rates
 - Ore types
 - Mining methods
 - Ownership
 - Metal prices

Geography of Myra Valley



Annual Precipitation 1979-2007 projected



Myra Creek in full flood



Lynx Diversion Ditch



Lynx Diversion Ditch breached



Lynx Diversion Ditch under repair



Myra Falls



Debris flow



Road washout



Thelwood Bridge washout



Jim Mitchell pipeline



Jim Mitchell washout and debris flow



A Challenge Met

Buttle Lake Recovery

- In the mid-70s Buttle Lake showed increasing zinc trends and decreasing plankton trends.
- In 1982 a new water treatment system was constructed around the waste rock dumps to intercept ARD
- Elected to switch from subaqueous tailings deposition in the lake to surface storage in 1984 (Social License)
- By 1995 the aquatic ecosystem had recovered dramatically and was considered to be equivalent to pre-mining conditions (Hallam Knight Piesold, 1995)

Zinc Concentrations in Buttle Lake 1966 - 1995



Addressing the future

- The new site Water Balance will help
 - Quantify all inputs
 - Identify inputs for possible point source treatment
 - Take advantage of new water treatment technology
 - Reduce reliance on pumping and lime addition
- The new Outer Drain and Pump House will help
 - Focus pumping from those sections of the Tailings Facility Outer Drain that must be captured and treated

Addressing the future (continued)

- The new Lynx Paste Tailings Facility will soon be functional, with potential for short term rain storm storage
- A vegetated cover on the current Tailings Facility and a more aggressive reclamation of the existing footprint will help slow the rate of surface runoff

Water Balance – impact of rain storms

Input	Average day	Rain storm
	29,000m3	87,000m3
Mill Process	21%	9%
HW/Myra Mine	6%	4%
Phillips Reach/Lynx Mine	7%	8%
Lynx Pit runoff	1%	11%
HW/Camp buildings and runoff	3%	7%
TDF and Paste Plant	16%	30%
Pump House	46%	31%
Reclaim water at 8,000m3		

The Tailings Facility Dam Upgrade Work



2006 TDF Upgrade Work



Paste Tailings Slope

