Surface Water Management Challenges at the Grum Sulphide Cell (GSC) Cover, Faro Mine Complex, Yukon

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## Contributors + Collaborators

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- Government of Canada – AANDC
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- SRK
- DES
- Pelly Construction
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- Merit Consultants
- Brodie Consulting
- YES Surveyors

- Zero Energy Institute
- Western Tank and Liner
- Boreal Engineering
- Chilkoot Geological Engineers
- EDI Environmental Dynamics
- BGC Engineering
- Gomm Environmental Engineering
- Superior Plastics
- Applied Soil Water Technologies
- Conestoga-Rovers & Associates
- Stratos
- RFP Solutions
- Common Ground Mediation and Consulting
- Environment Canada
Outline

• Faro Mine Complex Background
• GSC Cover Construction Design Rationale
• 2010 Construction
• Freshet 2011
• 2011 Construction
• Future Management of GSC Surface Water
• Lessons Learned
What we did and why...

- Design, rationale and construction
Start June 24, 2010...
About 1 year later...
$13 million later
And then it snowed...
Faro struggling to deal with meltwater

By Chris Oke

Wednesday May 25, 2011

The Faro minesite in July 2008.
Freshet 2011 – What happened?
Above average snowpack + Late Melt + Record of 20ºC

= TOO MUCH WATER!
Toe Berm Erosion
Vangorda Creek
< 1 mg/L TSS
< 0.005 mg/L Zinc

Discharge
184 mg/L TSS
2.1 mg/L Zinc

Compliance
< 15 mg/L TSS
< 0.5 mg/L Zinc
2011 Work Plan

- Additional studies and investigations
- Erosion repairs and mitigations
- Surface water management upgrades
- Contaminated seep water management upgrades
Figure 2: Soil Sample Results at the South Till Borrow Area of the Grum Sulphide Site.
Erosion Repairs and Erosion Mitigation
New toe berm surface (3m higher)

Original toe berm surface
Surface Water Management Upgrades
~8,000 m$^3$ storage in lined pond
(3 Olympic-sized swimming pools)
Unlined Contingency Depression (9,000 m³)
Contaminated Seep Water Management Upgrades
Lessons Learned

• Plan to manage surface runoff for at least one year following construction
• Thoroughly characterize the geochemical nature of your borrow sources
• Take your time. Don’t rush. Think the project through. Then review…
“Make sure you have somewhere for water to go during strange events.”
- Brent

“People grossly underestimate the amount of time and money required to maintain covers.”
- Bill