

Presentation to 16th ANNUAL BC/MEND METAL LEACHING /
ACID ROCK DRAINAGE WORKSHOP



Acid Rock Drainage Dry Covers Site Closure Program

Vancouver BC
December, 2009

Sydney Coal Fields



Coal Fields

Nova Scotia

Atlantic Ocean

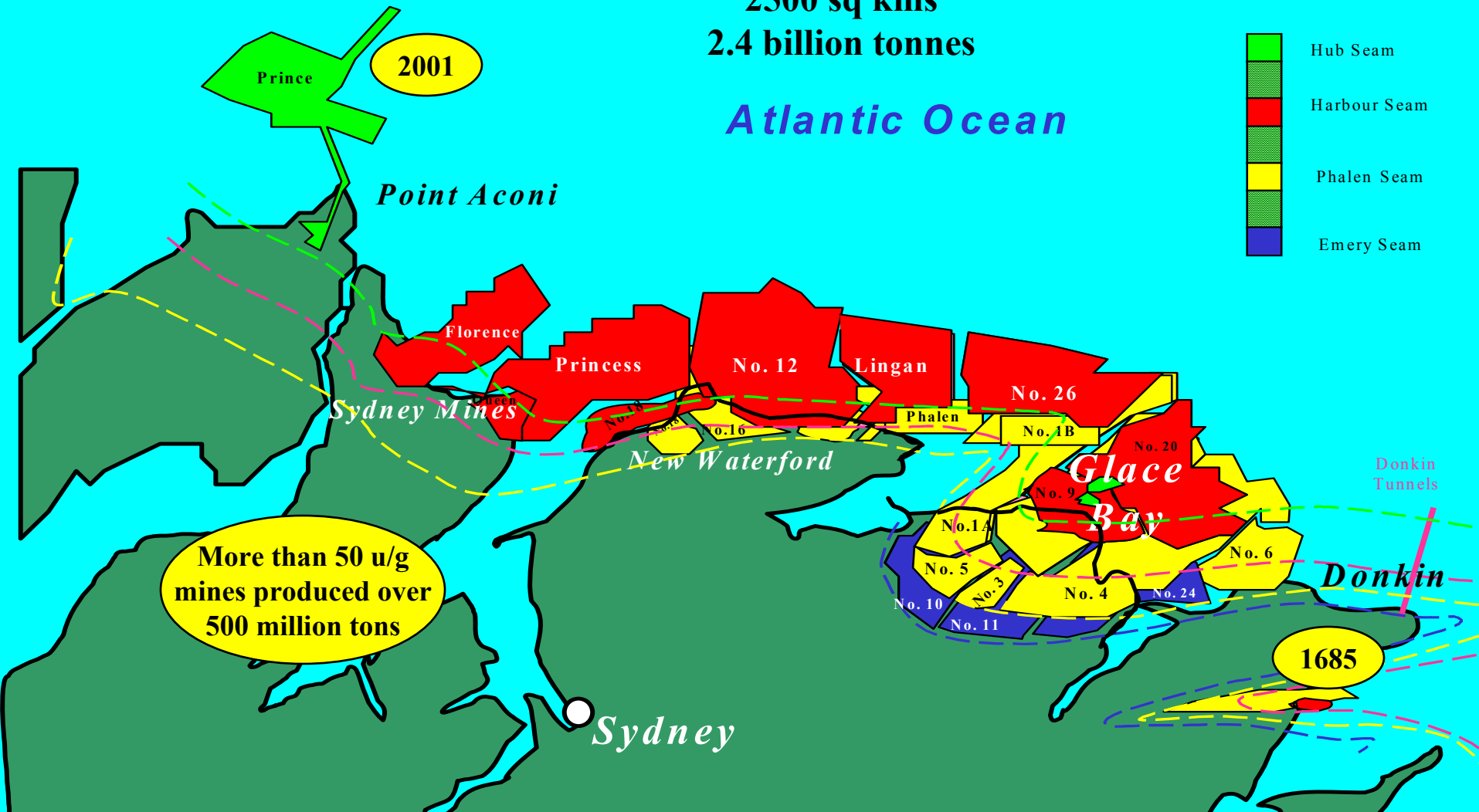
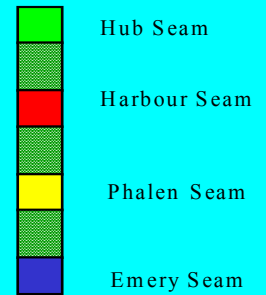
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Mining Operation History

11 Coal Seams
2500 sq kms
2.4 billion tonnes

Sequence of Coal Seams



CBDC Closure Design Criteria

- CBDC Environmental Policy.
- No further deterioration of the Environment.
- Protect Human Health.
- Adhere to applicable laws & regulations.
- Future land use will be compatible with intended land use.
- Components designed to 1:200 year flood/earthquake.

Dry Cover Sites

- The Victoria Junction Coarse Waste Pile
- The Princess Coarse Waste Pile
- The Franklyn Waste Pile
- The Summit Waste Pile

Victoria Junction Coarse Waste Pile

- Operated from 1976 to 1998
- 1000 tph coal preparation plant
- Coarse waste Pile = 26 Hectares/40 meters in height
- 9 million tonnes of materials
- Contained coal tailings & waste rock from the process plant
- Constructed on a wetland



Cap Selection Criteria

- Short term remediation efforts while studies are conducted
- Regulatory and public expectations
- Consolidate 12 years of environmental data from the site.
- What remediation techniques are available
- Must improve conditions in Northwest Brook



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Wetland Effects – Victoria Junction



HDPE Liner

- 6 mm HDPE liner
- Textured for slopes
- Multi layer Design
- Incorporate down slope drainage ditches
- Toe drain collection system



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1st Phase – Reshaping



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1st Phase – Reshaping



Liner Installation - Multi Layer

- Sloped Waste Rock Compacted
- 100mm sand bed
- HDPE liner
- 400 mm Drainage Layer
- Type A Geotextile
- 400mm Vegetative Cover
- Hydro seeded with erosion control measures



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Liner Installation – Drainage Layer



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Liner Installation – Damage Control



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Liner Installation – QA/QC



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Victoria Junction After 4 Years



G. Leongille 17th June 08

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Victoria Junction After 4 Years



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Victoria Junction After 4 Years



Princess Site Coarse Waste Pile

- Operated 1876 to 1976
- Coal Preparation plus steel making operation
- 40 hectares / 2 meter height
- 1.7 million tonnes
- Pile was reshaped + materials relocated



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Consolidation



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Consolidation



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Liner Installation



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Liner Installation



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Present Project Status



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Franklyn Site Coarse Waste Pile

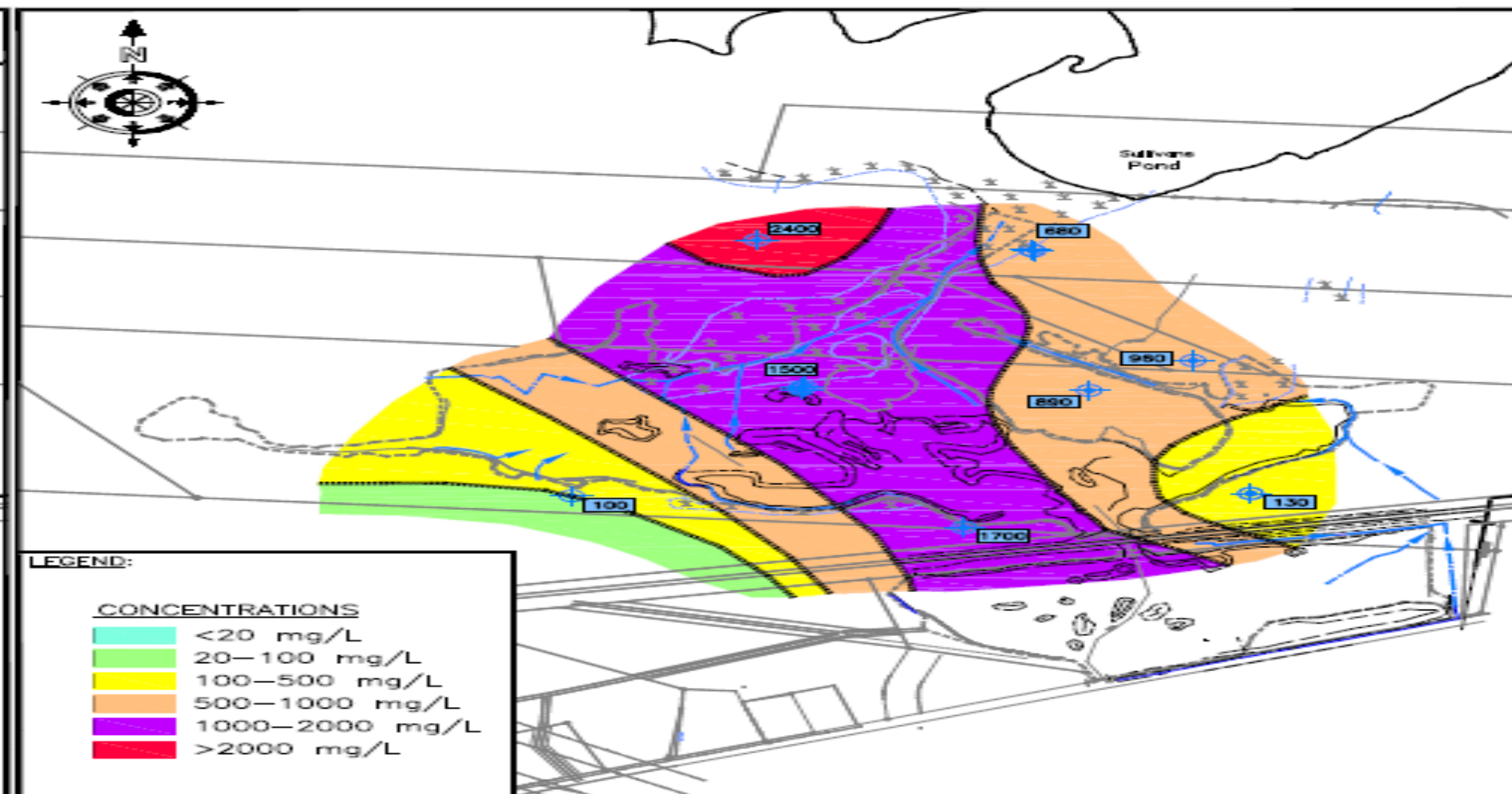
- Mines closed in 1952/54
- Site received material from 4 mines
- 0.5 million tonnes of waste rock
- One Mine water discharge point
- Material testing showed all materials were ARD generating even after 70 years.
- The project began in 2008 and will be completed in 2010.



DEVCO Franklyn Sampling

FIGURE F
SULFATE
(Filtered)

SCALE: 1:4000



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Franklyn Site Coarse Waste Pile



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Waste Pile Construction



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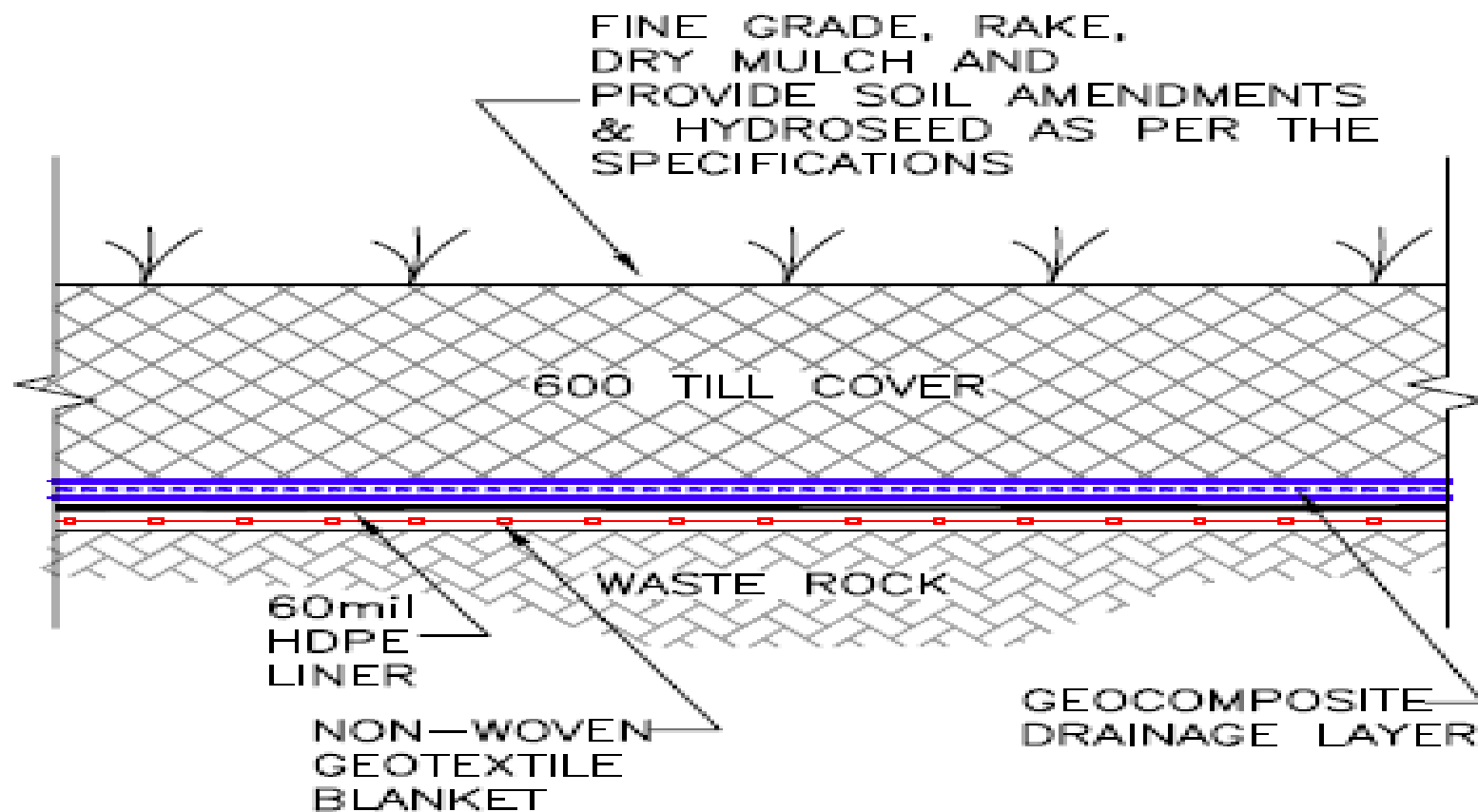
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Waste Pile Construction



Capping Option



OPTION #1 — 60mil HDPE

Long Term Monitoring

- The pile will have monitoring equipment installed to measure temperature, pore moisture, water levels and oxygen content.
- Site boreholes will be used to assess the change in the present groundwater chemistry
- Ecological studies will be conducted on a regular bases to the surrounding eco-systems.
- Waste pile will be used to collect data on the processes occurring under the HDPE liner

Summit Waste Pile

- The last of the major site will be undertaken between 2009 and 2010
- Operated 1911-1973
- Produced 1.7 million tonnes of waste rock
- Over 40 hectares



What Works?

- HDPE liners have been successful on coal mining waste rock piles in starting the recovery process to the surrounding environment.
- Even with an effective cover EEMP and LTCM plans are required.
- That many groups were required to produce a successful program.

An aerial photograph of a coastal region, showing a river flowing into a bay. The land is green and hilly, and the water is a deep blue. The image is partially obscured by a white curved shape at the bottom.

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Thank You