8-Mile Channel
Remediation

Background / 1973 – ’77 / ’04 – ‘06

Discovery of contamination / Sep. ’06 – Mar. ‘07

Remediation work plan / Oct. – Dec. ’07

In-channel works / Jan. – Mar. ’08

Borrow material / Feb. ’08

Single use treatment cell / Jan. ’08 to present
Background

- 8-MILE CHANNEL
- Nelson River
- Norway House
- Winnipeg
Background

- Constructed in early-to mid-1970s
- Substandard clean-up
- Debris and petroleum (PHC) contamination left at channel
- Contractor now defunct
Background
Background
Background

- Debris clean-up: 2004 through 2006
- Employed local Cree Nation Contractor
- Coordination with Cree Nation
- EM surveys & soil sampling programs
- Now complete
PHC Discovery

SEPTEMBER 2006

• Final inspection with Norway House Cree Nation
• Evidence of PHC contamination at shoreline
• Soil grab sample analyses confirmed contamination
PHC Discovery

Airstrip
PHC Discovery

- North side of 8-Mile Channel
- Inlet to channel at Playgreen Lake
- Straddling shoreline
PHC Discovery

INVESTIGATION

• Conducted in March 2007
• Compared to CCME Tier 1 parkland criteria
• Established horizontal and vertical limits of contamination:
  – $V \approx 4000 \text{ m}^3$
  – $A \approx 1800 \text{ m}^2$
  – Max. depth $\approx 4 \text{ m}$
  – Approx. 50% below summer water level (by vol.)
  – Approx. 25% below winter water level (by vol.)
PHC Discovery

Area of Investigation

Area of Impact
Remediation Work Plan

• Wet (e.g., dredge) or Dry (e.g., cofferdams)?
• Dry:
  – Reduced impact on channel and downstream waters
  – Greater control over excavation incl. sampling
  – Less water mixed with contaminated soil
  – Increased precision during backfilling
Remediation Work Plan

- Summer or Winter?
- Winter:
  - Eliminate wave action
  - Able to work from ice
  - Easier access to work site
  - Frost would provide additional stability
Remediation Work Plan

• Means of isolation?
• Aqua Dams:
  – Minimal disturbance of bottom sediments
  – More easily installed than sheet piling or cofferdams
  – Already successfully utilized in northern MB
  – Readily available
Remediation Work Plan
Remediation Work Plan

- 9:1 excavation slopes
- 9 m setback from toe of slope to aqua dam
- Dewatering well network inside setback
Remediation Work Plan

- Proposed re-use of previously disturbed areas
- Consulted with local resource management board for approval
- Applied for and acquired MB Conservation and DFO permits between October and end of December 2007!
Remediation Work Plan
In-Channel Works
In-Channel Works

Welcome to Northern Manitoba!
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works

- Seepage under the dam at SE corner
- Shored dam using silty backfill dike along inner face
- Dewatering successful, though continuous
In-Channel Works

Earthen Dike
In-Channel Works

- All pump intakes were fitted with fish screen structures
- A fish biologist conducted the salvage operation
- 248 fish were salvaged with 97 mortalities
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works
In-Channel Works

- Inner earth dyke was removed and used as backfill
- Aqua dams were removed by first allowing controlled flooding of isolated work area
- Dams were pulled from channel using cables manipulated by backhoes
- Destroyed dam material and silt curtain hauled to Jenpeg landfill
In-Channel Works
In-Channel Works

4:1 shoreline slope
In-Channel Works
Borrow Material

- Texture consistent with channel bottom material
- Initial samples showed no contamination
- Discovered limited debris and evidence of PHC impact during final removal of borrow
Borrow Material

• Potentially contaminated material was disposed of in treatment cell
• Debris was removed by hand to maximum extent and diverted to Norway House in solid waste stream
• Test pitting determined contamination was very limited (< 20 m³) and debris was isolated
Borrow Material
Treatment Cell

Proposed cell area: > 7500 m²
Treatment Cell
Treatment Cell
Treatment Cell

• Actual combined volume of material placed in both cells:
  
  7000 m³

• Demobilization from site completed by late March 2008
Treatment Cell

• Returned to treatment cell in September 2008
• Turned soils and collected soil samples
• Results: 13 of 32 soil samples exceeded
• One ‘hot spot’
• Turned and sampled again in September 2009
• Results are pending
Acknowledgements
THANK YOU

QUESTIONS?