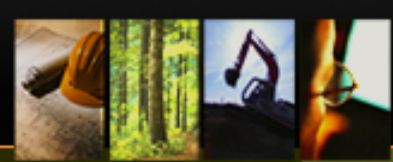


DESIGN AND IMPLEMENTATION OF AN ALTERNATIVE WATER MANAGEMENT STRATEGY

**District of Mission Landfill
Mission, BC**

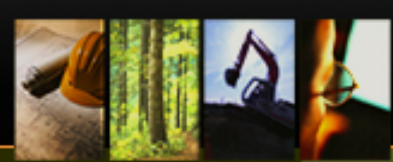
**Remediation Technologies Symposium
October 22, 2010**



AGENDA

- Background
- Objectives & Evaluation
- Short-Term Actions
- Long-Term Actions
- Summary





BACKGROUND

- District of Mission landfill
- 8.2 hectares
- 20,000 tonnes municipal waste/yr
- Developed in abandoned gravel pit
- Natural attenuation landfill



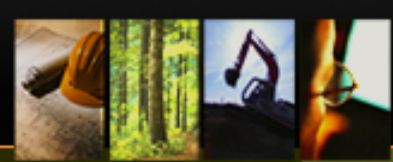


Phase A & B

Phase C

Infiltration
Pond

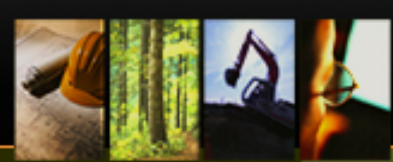
Aeration Pond



BACKGROUND

- Groundwater seeps identified in early 90s along creek
- Groundwater collection and pre-treatment system installed in 1994
 - Aeration and re-infiltration
- System successfully addressed leachate until 2004
 - Iron and ammonia

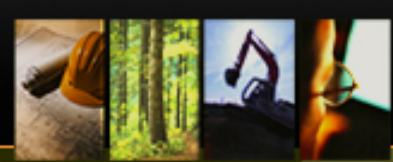




BACKGROUND

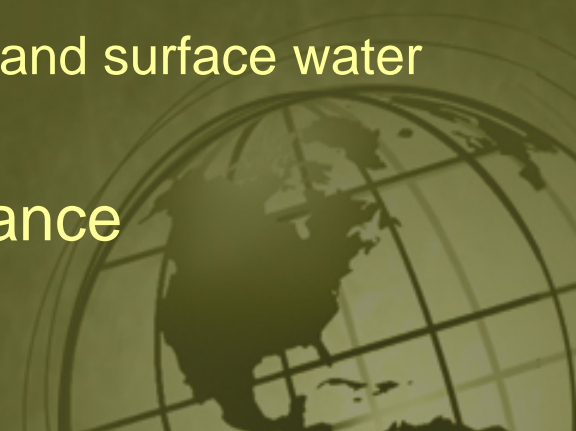
- 2004 – operation of new lined cell began
- Pre-treatment capacity of aeration pond and attenuation capacity of aquifer exceeded
 - Flow capacity of AP exceeded by up to 10x
 - Loading from lined Phase C
- Non-compliance at property boundary
 - Groundwater
 - Surface water (seeps)

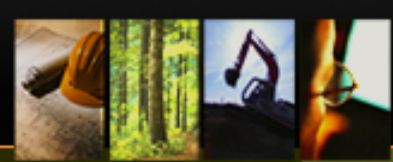




OBJECTIVES

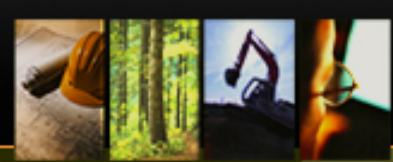
- Implement long-term water management strategy to facilitate ongoing landfill development
 - Optimize the use of existing infrastructure
 - Integrate with landfill development plans
- Establish a reliable, cost effective long-term leachate management plan
 - Reduce landfill impact on the groundwater and surface water
 - Minimize capital and life-cycle costs
- Obtain and maintain regulatory compliance





EVALUATION

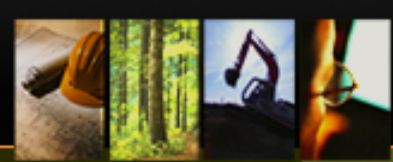
- Define problem
 - Hydrogeological assessment
 - Water balance modeling
 - Landfill life-cycle cost assessment
 - Leachate management strategy
 - Compliance plan
- Evaluate solution
 - Assessment of alternatives
 - Environmental impacts, technology reliability, logistics, economics



Selected Alternative

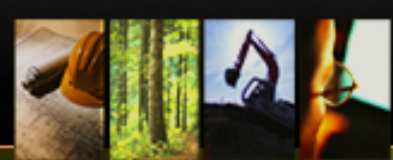
- On-site pre-treatment and infiltration
 - Proven technology
 - Readily constructible
 - Uses existing infrastructure
 - Can be integrated into future landfill development
 - Cost effective



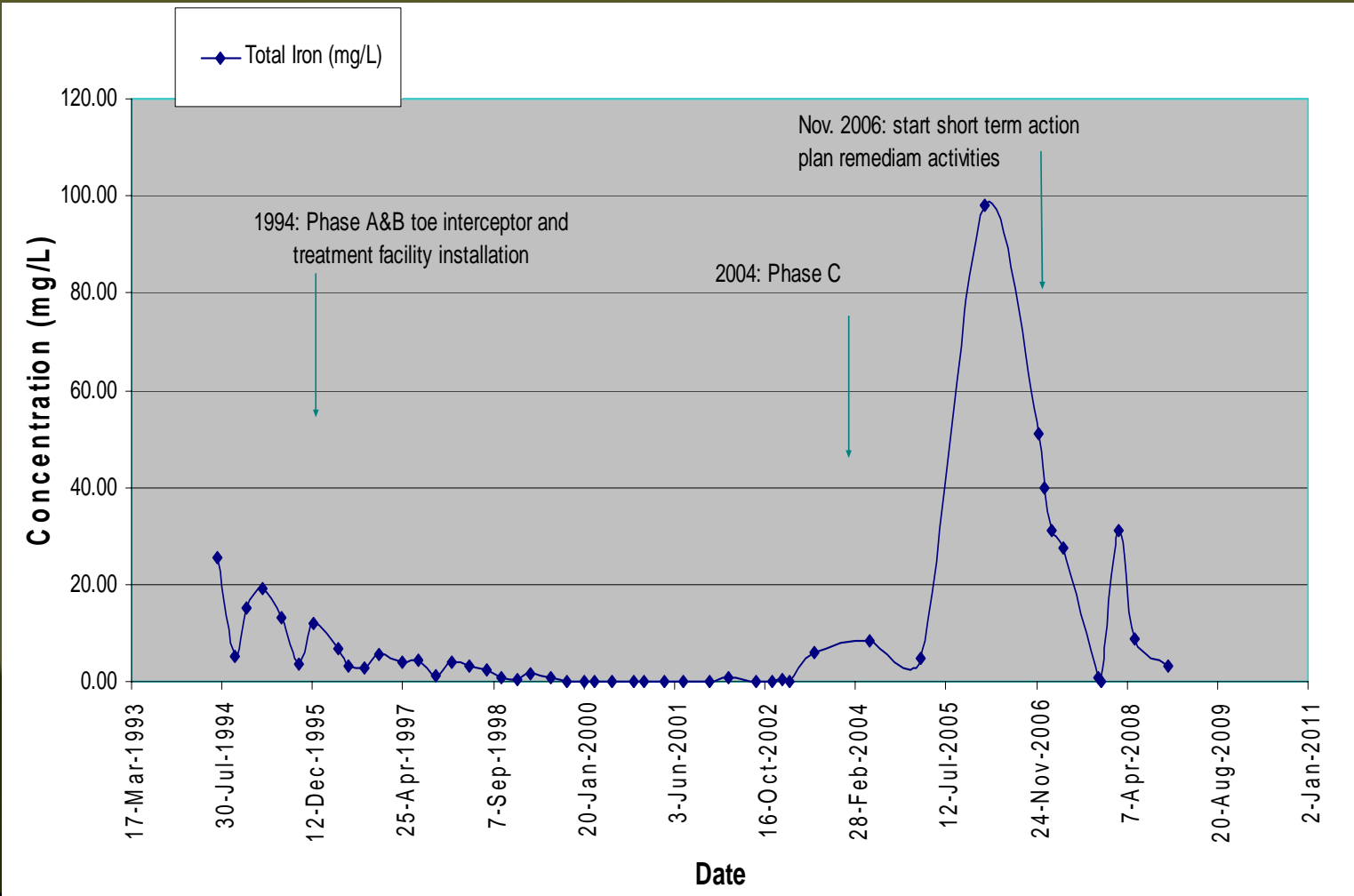


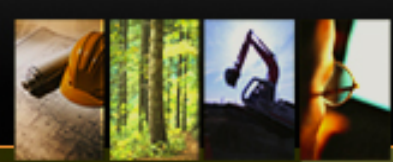
SHORT-TERM ACTIONS

- Modified Phase C liner to retain leachate
- Dredged existing infiltration pond
- Separate clean surface water and divert to new retention pond downgradient of landfill
- Upgrade Phase A and B interim covers
- Result:
 - Decrease in iron concentrations in surface water
 - Estimated decrease in aquifer loading from 83,000 to 63,000 m³/yr



Iron concentrations





LONG-TERM ACTIONS

- Reduce amount of leachate generation
 - Phase A and B interim cover
- Increase level of leachate pre-treatment
 - Upgraded aeration pond treatment capacity
- Optimize use of aquifer for maximum attenuation
 - Relocated infiltration pond
- Provide treatment of groundwater seeps
 - Engineered wetlands





Phase A & B

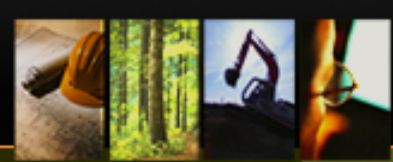
Phase C

New
Infiltration
Pond

Stormwater
pond

Aeration Pond

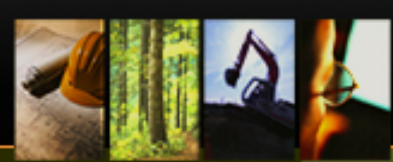
Engineered Wetlands



LONG-TERM ACTIONS

- Performance and compliance monitoring
 - Surface water
 - Groundwater

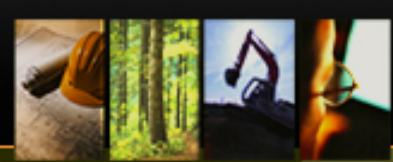




SUMMARY

- Implement long-term water management strategy to facilitate ongoing landfill development
- Establish a reliable, cost effective long-term leachate management plan
- Obtain and maintain regulatory compliance





CONTACT INFO

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