

September 21, 2020 | RemTech Europe, Contaminated sites sustainable management strategies

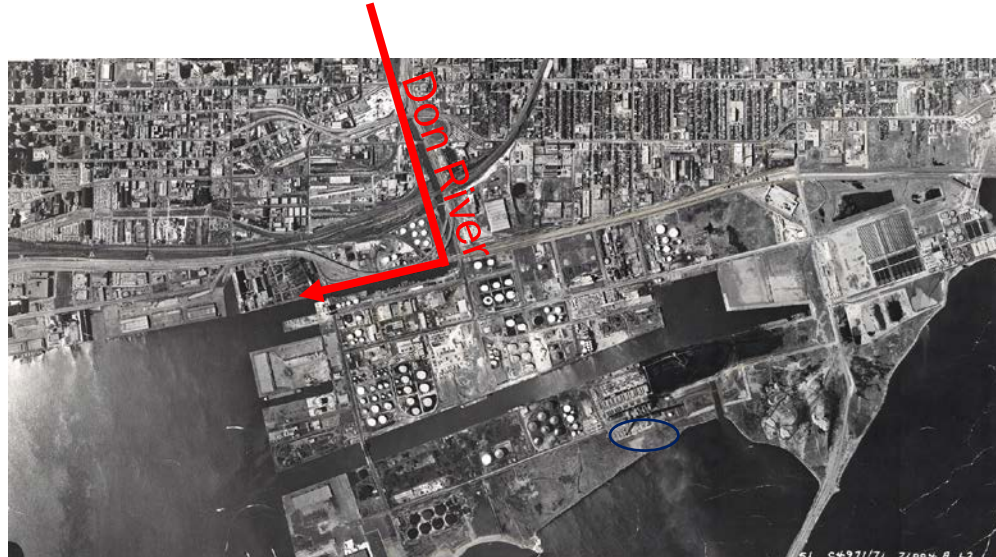
Constructing a 1 Km River near
downtown Toronto, Canada through Contaminated Land:
Risk Based Strategy
Maximized Soil Treatment and
Reuse and Land Use Controls

Meggen Janes, Director Soil and Groundwater
Waterfront Toronto

Toronto Port Lands Flood Protection Project

The Port Lands area, on the shore of Lake Ontario, immediately east of downtown Toronto were created through decades of infilling of historic wetlands and has historically been used for heavy industry.

The project will flood protect 240 hectares of land in the Port Lands and surrounding communities by building a new one kilometer river channel and two new river outlets to convey flood waters. New parks, roads and bridge network will complete the public realm around the river channel that will become catalysts for a range of memorable activities and experiences and will unlock a 22 hectare area for revitalization.



Presentation Overview

- Risk based approach Land Use Controls and risk management measures
- Soil Excavation and Treatment for Reuse
- Current Construction Status



Transformative Vision

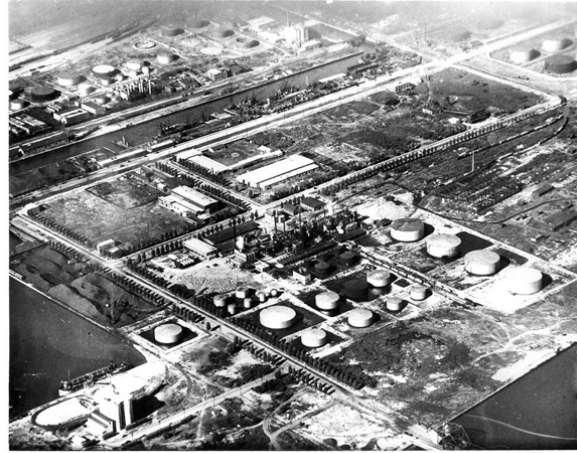


Upon Completion in 2024 and Beyond



Historical Site Use

- Crude Oil/Petroleum Refining and Storage
- Natural Gas Processing
- Explosives and Ammunition Manufacturing
- Metal Treatment and Fabrication
- Concrete and Cement Manufacturing



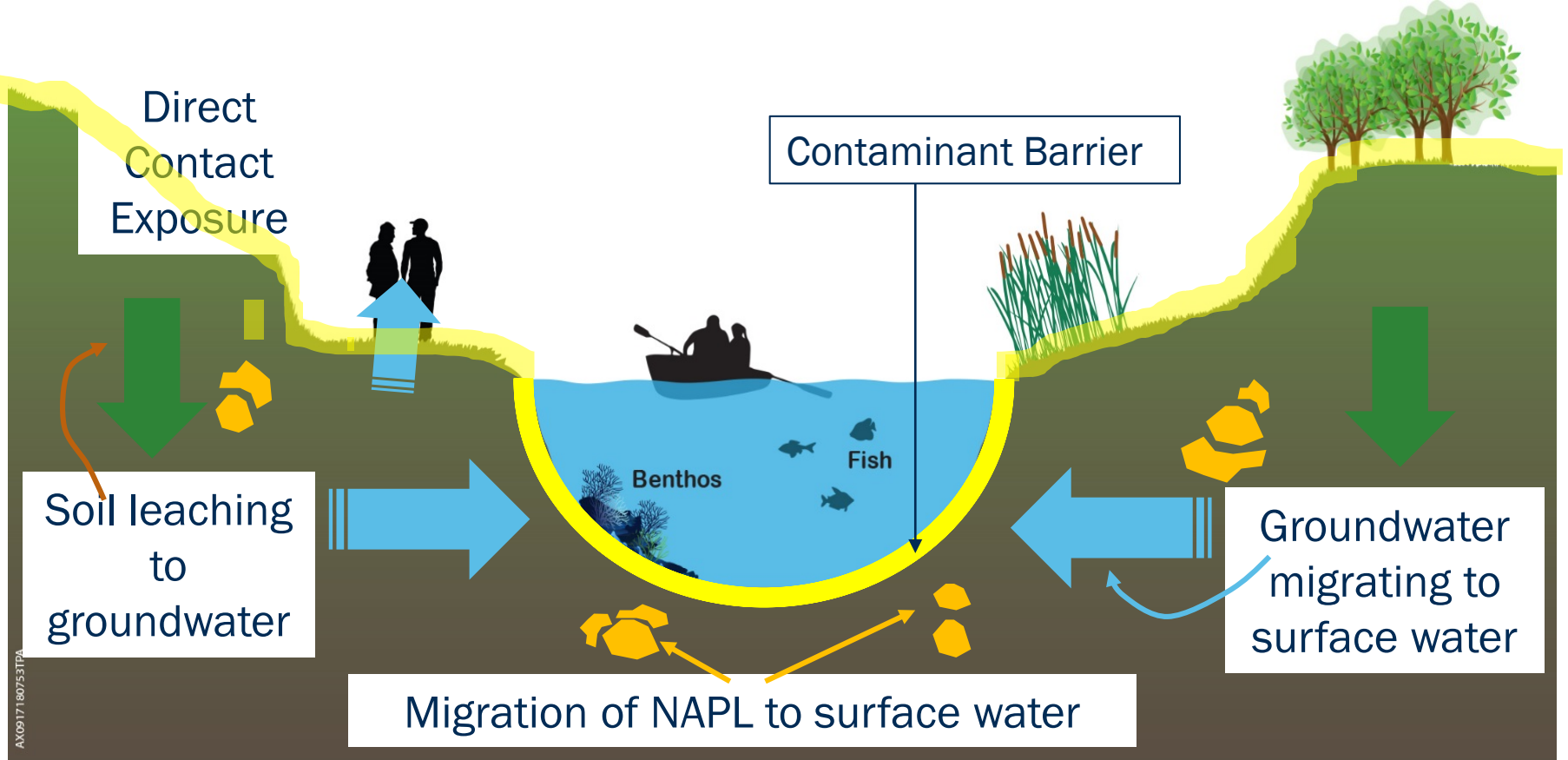
Images from
http://www.blogto.com/city/2012/02/what_the_port_lands_used_to_look_like/

Risk Assessment

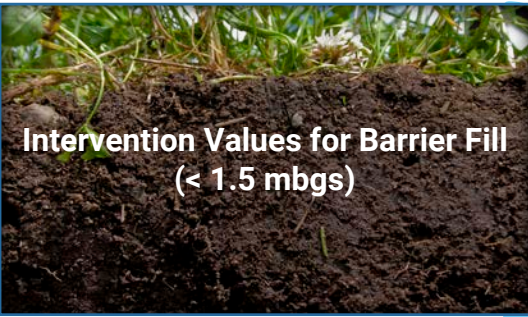
- No current environmental regulatory approval process in Ontario for a project of this nature – creating a river through a brownfield
- Used to identify and evaluate the risks to human health and the environment, and develop effective measures to mitigate or remove those risks
- allows for the development of a comprehensive strategy for treating and reusing soil within the project area – meaning that soils can be moved, treated and placed across the entire site



Key Pathways of Concern



Risk Management Barrier – 1.5 metre cap



Direct Contact Pathways

Recreational User	Outdoor Worker
Indoor Worker	Construction Worker
Plants & Soil Organisms	Mammals & Birds



To be used below barrier

Like to Like
Concentration
Evaluation

Free-Phase
Threshold

Vapour
Intrusion

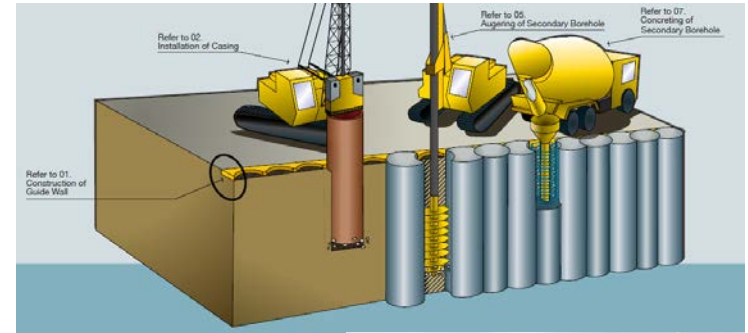
Leach Testing

Risk Management Barrier: Cutoff Walls at Edge of River



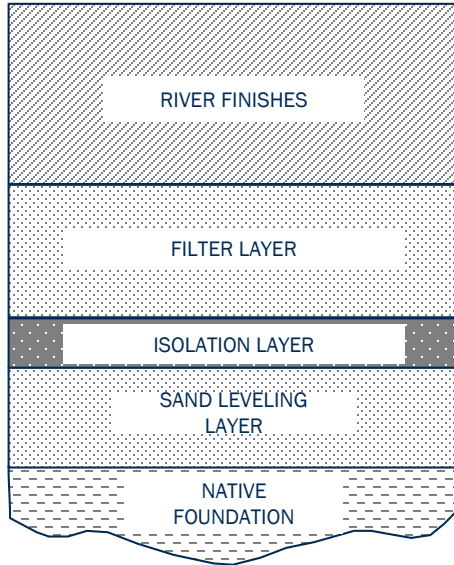
RMM: Cutoff Walls – Two Types

- Concrete Secant Pile walls with over 1700 overlapping piles drilled into bedrock (20 to 40 metres deep)
- Bentonite Slurry Walls

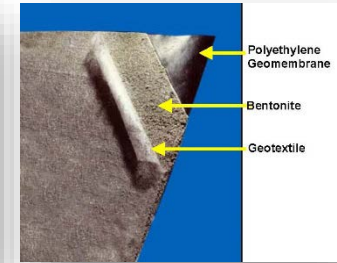
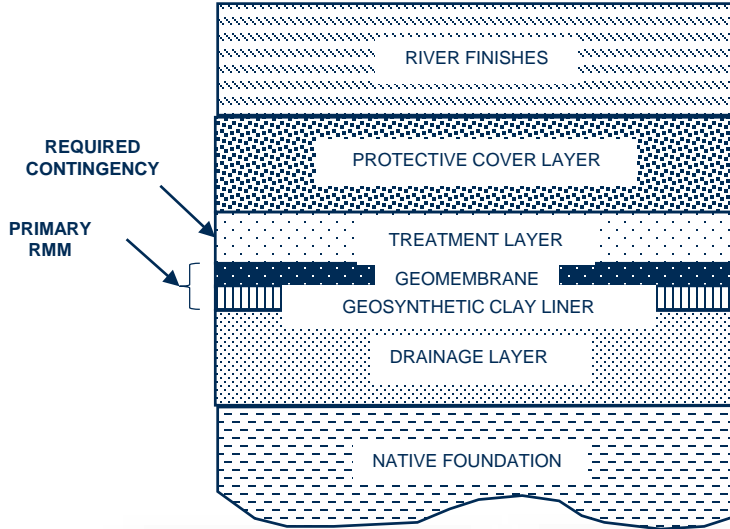


Risk Management Barrier – at Surface Water

Wet RMM Construction



Dry RMM Construction

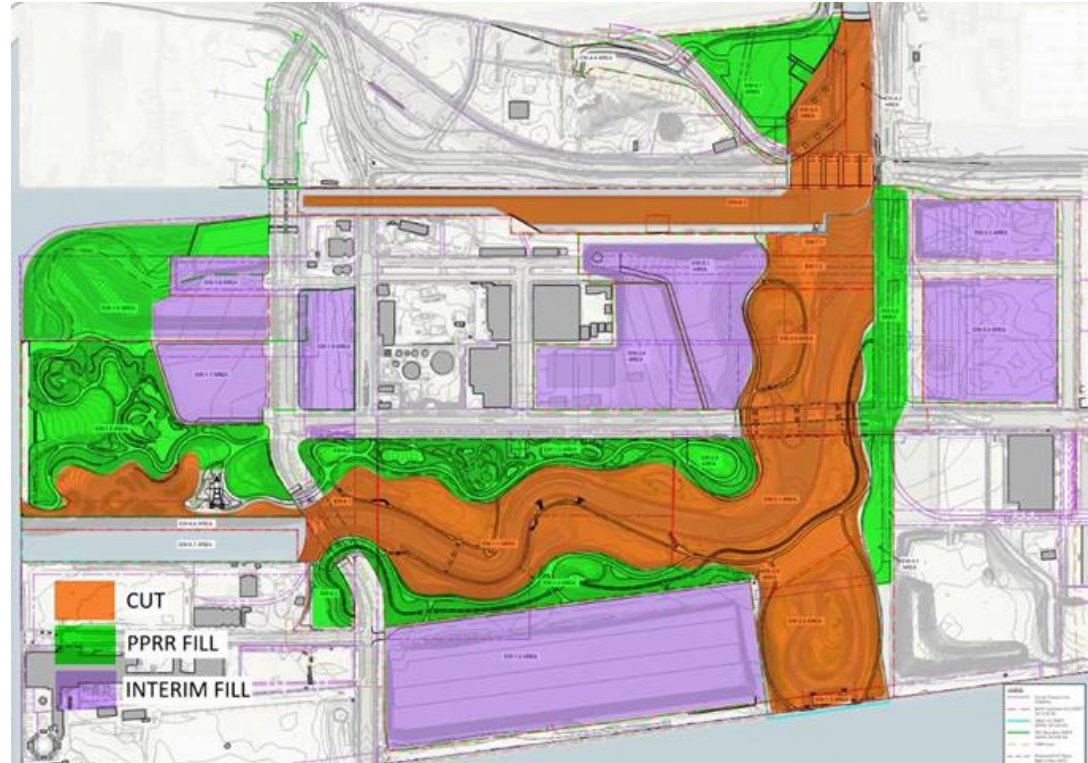


Toronto Port Lands Soil Reuse

Support sustainable soil management:

>1,000,000 m³ to be cut for new
Don River

>700,000 m³ required for
flood protection



Soil Excavation



Soil Treatment

- Soil treatment through biopiling and STARx Smoldering Treatment (both of which were piloted in PLFP in 2017/2018)
- Approximately 300,000 m³ to be treated over two seasons (biopiling) and 18 months (STARx)
 - Up to 72,000m³ STARx
 - Up to 250,000m³ biopiling



Soil Treatment

- Highly contaminated soil through STARx – smouldering
- Successful Pilot Test
 - Initial PHC of 23,700 to 35,200 ug/g
 - PHC concentration reductions between approximately 95% and >99.7%
 - Remediation complete in 10 days
- Full Scale
 - 20 by 20 m containers, 250 m³ each
 - 8 containers; 72,000 m³ over 18 months



Soil Treatment

- Less contaminated soil through Enhanced Bioremediation
- Successful Pilot Test
 - 51 to 59% reduction in total PHCs in 8 weeks (enhanced and aerobic)
 - Remediation complete in 8 weeks
- Full Scale
- Long windrow bioremediation over two seasons; started late June.



Water Treatment Facility



Construction Progress



Thank you.

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