

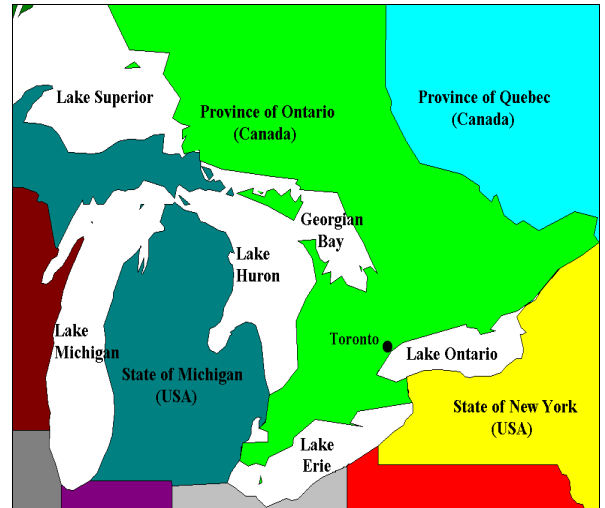
Toronto Harbour Removal Demonstration (1992)

The Canadian Government, in accordance with the 1987 Canada-USA Water Quality Agreement, launched a \$125-million Great Lakes Action Plan in 1989. As a result, \$55 million was allocated to Environment Canada's Great Lakes 2000 Cleanup Fund which created the Remediation Technologies Program in 1990. This program is designed to demonstrate and assist in the commercialization of innovative technologies for remediation of contaminated sediment.

In June, 1992, the Remediation Technologies Program tested an innovative sediment removal technology, Cable Arm Clamshell, in Toronto Harbour. The selected site, Parliament Street Slip, was marginally contaminated. Sediment was composed mainly of a mixture of silty-clay. The water depth averaged 8 m. No active outfall is located in the Parliament Street Slip which minimized external input during and after the technology evaluation.



View of working cell and holding barge



Location of Toronto relative to the Great Lakes

During this demonstration, auditing and environmental monitoring processes were established to ensure reproducible and reliable data collection, and at the same time ensure total compliance with environmental requirements.

The most important innovative features of this demonstration were the placement of a confined working area, which was mainly a section of silt curtain installed to create a cell approximately 18 m x 18 m x 8 m, and a pre-treatment/filtration process.



The basic pre-treatment process was put in place in order to decrease the volume of water included in the sediment transported to the treatment facility. The containment area of the transport barge was divided into two sections using twenty foot containers welded in place to span the entire width of the boat, leaving free space. Five tons of 2 cm gravel formed a cove on the inside wall of the partition. Since the ship was ballasted to effect a 15 degree slope to the stern, the excess water from the sludge was able to filter through the gravel.

Results indicated that the Cable Arm Clamshell was able to :

- remove sediment with a minimal addition of excess water. Samples have indicated that the percentage of solids in the dredged material was comparable to the in-situ solids content
- achieve cycle time close to 1 minute
- maintain minimal sediment re-suspension under various operational conditions
- achieve production rate greater than 100 m³/hr.



Parliament Street Slip demonstration setup

Water quality was monitored throughout the demonstration. The results from the water quality monitoring program indicated that re-suspension of material decreased as the operator became more familiar with the Cable Arm Clamshell and procedures related to environmental dredging.

In general, the results indicated that the Cable Arm Clamshell needed evaluation in different site conditions, such as open water, in order to determine the full capabilities of this innovative sediment removal technology.

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