



Pneuma Pump

Conventional dredging technologies, both mechanical (open clamshell bucket, excavators, etc.) and hydraulic (e.g. suction pumps), are still commonly used in the Great Lakes. These technologies are now dated, and can no longer remove contaminated sediments adequately in ports and harbours throughout the world. Alternative sediment removal technologies must be developed and tested in order to remediate those areas.

One such alternative tested was the Pneuma Pump. This technology manufactured by Pneuma S.R.L. and operated by Voyageurs Marine uses static water head and compressed air inside special cylinders in a manner comparable to a piston. The hydrostatic head causes each cylinder to sequentially fill with sediment slurry. As each cylinder is filled, compressed air supplied by a distributor linked to a compressor acts as a piston and the slurry is forced through a valve to the discharge pipeline. As the cylinder empties, the compressed air is discharged thus releasing the internal pressure of the cylinder.

A Pneuma Pump #150/30 was first tested by the Remediation Technologies Program



Pneuma Pump used during the Collingwood Harbour projects

of Environment Canada's Great Lakes 2000 Cleanup Fund in Collingwood Harbour in November, 1992. Its goal was to remove contaminated sediment located in a former shipyard. Following this demonstration, this innovative technology was then used commercially in the fall of 1993 by Transport Canada to remove marginally contaminated sediment located in another portion of Collingwood Harbour. The demonstration and the commercial application played an important role in the cleanup of Collingwood Harbour, which was delisted as an Area of Concern in 1994.



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Canada Canada

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Great Lakes 2000
Cleanup Fund

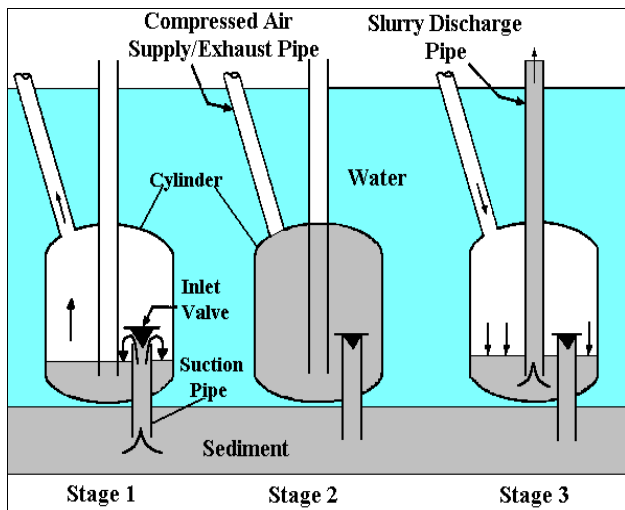


Various models of the Pneuma Pump are available. Each has a different size and capacity. The one demonstrated in Collingwood Harbour had a maximum production rate of 150 m³/hr with a reflow distance of approximately 2 km. Various modifications were performed on the tested Pneuma Pump to ensure that the RTP's requirements for environmental dredging would be met :

- Specifically designed shovels with a height of 0.4 m and an opening 0.4 m²
- Specifically designed shovel screens with rectangular openings of 0.1 m² to minimize debris entry
- Access ports to enable quick clean out of the cylinders.

Several models of the Pneuma Pump were tested in other regions of the world. The latest project of importance was carried out by the U.S. Environmental Protection Agency in Gibraltar Lake, California, in 1988. The Pneuma Pump was used to dredge approximately 350,000 m³.

Both the performance and water quality monitoring results from the Remediation Technologies Program of Environment Canada's 1992 demonstration and Transport Canada's 1993 commercial application indicated that the Pneuma Pump is very effective at removing contaminated sediment in areas where little debris is encountered. This project also proved that the Pneuma Pump can compete with conventional technologies for navigational and recreation dredging projects.



Pneuma Pump sediment removal cycle

For more information :

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