


[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment and to be disclosed to public)]

Technology Information	
Area	Area 3: Removal of radioactive materials from the seawater in the harbor
Title	Trailing Suction Hopper Dredge with integrated radioactive material sorting (ScanSort)
Submitted by	AMEC
<p>1. Overview of Technology (features, specification, functions, owners, etc.)</p> <p>A large trailing suction hopper dredger (TSHD) with integrated radioactive material sorter would allow for the remediation of the harbor 10-20 times quicker than conventional methods. Large TSHDs can remove seabed material at a rate of over 1 metric ton per second (3600 tons per hour). The slurry material pumped from the seabed can be segregated based on its radioactive content using the same principals and automation employed by AMEC's ORION ScanSort. The segregation can be performed on the dredge vessel or on land after the dewatered material has been transferred to a shore based processing facility. Due to the release mechanism and nature of the seabed environment, radioactive segregation should provide very large volume reduction. The system would utilize sub meter accuracy GPS to support precise coverage of the seabed.</p> 	
<p>2. Notes (Please provide following information if possible.)</p> <ul style="list-style-type: none"> - A Trailing suction hopper dredger with integrated ScanSort system was designed for the Dounreay Seabed remediation project. The design estimated complete remediation of approximately 10 km² of seabed in under 4 months. The conventional methods used at Dounreay, including underwater detection and remediation via robot or diver, has taken over 8 years. These conventional methods are extremely dangerous to execute on the open sea. 	

- A large trailing suction hopper dredger with ScanSort will have lower total remediation cost than convention methods and the schedule can be 10-20 times shorter.

AMEC has significant experience with dredging operations, a follows:

Project example - Northwest Territories pre-dredging assessment project

The project is being conducted for the Government of the Northwest Territories Department of Transportation, on behalf of the Canadian Coast Guard. The Coast Guard Dock in Norman Wells has experienced higher than normal rates of sediment deposition, combined with record low water levels on the Mackenzie River in 2010. Sediment dredging is required to maintain use of the facility.



The Canadian Coast

Guard dock requires sediment dredging to maintain use of the facility in Norman Wells, North West Territories, Canada

AMEC project activities will include:

- Determination of the volume of sediment required to be dredged
- Determination of sediment disposal options
- Selection of dredging equipment
- Preliminary cost estimates.
- Regulatory approvals
- Engineering design to protect the facility from ice during river break-up
- Construction monitoring.

This project allows the first use of the newly opened materials laboratory at the AMEC Yellowknife

office, as well as the Edmonton analytical chemistry laboratory, demonstrating the full-service capabilities of One AMEC.

Project example - Back Channel Navigation and Safety Improvement Project, Port of Long Beach, California, USA.

AMEC performed a sediment characterization investigation comprised of an eight-site study including sediment bulk sediment chemistry and toxicological components. Upland disposal of sediments was indicated. Ancillary project modeled future turbidity/toxicological impacts of dredging. In order to broaden the Inner Harbor Turning Basin and widen the main channel, a sediment characterization was necessary to permit dredging and disposal



operations. The project experimental design incorporated sampling of recently deposited sediments and underlying sediments separately for each of four areas; characterization included chemistry and toxicological testing. Apparent toxicity in some areas and elevated chemical concentrations in others resulted in only a minority of sediments being suitable for aquatic disposal, but due to

logistical constraints, all sediments will be disposed of at an upland location. AMEC's responsibilities included the preparation of sampling and analysis and site-specific health and safety plans, coordination of sampling activities with Port environmental staff, security and tenants; oversight of data quality and validity; preparation of draft and final reports; and investigation of geotechnical reports to identify native sediment strata boundaries.

- Others (referential information on patent if any)

Further AMEC projects include, as below:

- Recovery Project, Former Kaiser Site - sediment collection and testing contract, Los Angeles, California
- Port-wide Water Quality Study, Los Angeles, California
- Ormond Beach Wetland Restoration, Oxnard, Ventura County, California
- Back Channel Navigation and Safety Improvement Project, Port of Long Beach, California
- Tijuana Estuary Restoration, San Diego, California