

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

Technology Information	
Area	2 & 3 (Select the number from "Areas of Technologies Requested")
Title	Sorbster™ Adsorbent Media for Water Treatment
Submitted by	MAR Systems Inc.
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p>Sorbster™ media is a 3/16 inch to 1/8 inch sized adsorbent material developed for the removal of heavy metals and other contaminants from water by chemisorption. Contaminants bond at chemically enriched sites throughout the highly porous structure of this functionalized aluminum oxide based solid. Sorbster properties include:</p> <ul style="list-style-type: none"> • High adsorbent capacity: up to 75% by weight • Effective across a broad pH range: pH 3 to 12 • 50 lbs./ft³ bulk density • Highly proficient in the removal of mercury, arsenic, selenium, cadmium, tin, zinc, copper, vanadium, hexavalent chromium, fluoride and silica • Also a demonstrated proficiency for thallium, barium, boron, cobalt, lead, antimony • Functional in high TDS (total dissolved solids) waters: seawater ions do not interfere with Sorbster metals removal • Contaminant removal performance accomplished in fresh, brackish and seawater conditions with the media tolerating chloride up to 20,000 mg/L, sulfate up to 89,000 mg/L, calcium up to 3500 mg/L and magnesium up to 6000 mg/L • Contaminant removal is rapid: 5 to 30 minutes empty bed contact time is typical for up to 99% removal • Removal to ultra low µg/L (ppb) and ng/L (ppt) levels can be achieved • Multi-metal removal is accomplished in a single water pass • Sorbster media can be applied in standard pump and treat vessels, temporary tanks, porous flow-through packaging (fabric bags) or added direct to bodies of water • Water-to-Media contact time is the only control parameter for contaminant removal • No ancillary waste streams with Sorbster media use • Spent media is vacuumed from vessels and disposed of. The media is not 	

regenerated.

2. Notes (Please provide following information if possible.)

- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)

Sorbster™ media is a commercialized technology that has successful current installations in USA industrial wastewater applications. These installations include groundwater, municipal wastewater, process water and industrial wastewaters for the removal of selenium, zinc, lead, copper, boron and cyanide. Additionally, antimony, selenium and mercury removal systems are currently being evaluated by clients in field trial applications.

Sorbster media is manufactured by MAR Systems Inc. at its plant in Solon, OH, and is available to meet global demands.

- Challenges

Sorbster™ media has not been tested commercially for nuclide removal. Its ability to remove barium from industrial wastewaters indicates probable functionality for strontium and cesium. Testing is recommended to define a suitable contact time and the proficiency for these contaminants.

- Others (referential information on patent if any)

Patented technology: US 7,341,667, US 7,449,118, US 7,479,230

【Areas of Technologies Requested】

- (1) Accumulation of contaminated water (Storage Tanks, etc.)
- (2) Treatment of contaminated water (Tritium, etc.)

- (3) Removal of radioactive materials from the seawater in the harbor
- (4) Management of contaminated water inside the buildings
- (5) Management measures to block groundwater from flowing into the site
- (6) Understanding the groundwater flow