



New resin saves costs in groundwater treatment

The Department of Energy (DOE) and contractor CH2M HILL Plateau Remediation Company are using a new treatment material that is anticipated to increase efficiency and reduce costs in groundwater treatment at the Hanford Site in southeast Washington State.



Along the Columbia River, CH2M HILL has installed the next generation of groundwater treatment systems to pump and treat contaminated groundwater at the Hanford Site. The systems use ion exchange resin that is loaded into a series of treatment tanks. As water flows through the tanks, the resin strips specific contaminants from the water. The new systems use a longer-lasting resin, called ResinTech™ SIR-700, that is anticipated to reduce lifecycle costs through its increased capacity and longer design life - reducing future facility modification costs and allowing for the treatment of more contaminated groundwater.

The anticipated cost savings are the result of effective materials selection. The new treatment resin retains more than 15 times chromium than previous resins. As treatment systems are fitted with the new material, the increased capacity of the resin and the need for fewer resin loadings will reduce worker handling and reduce lifecycle costs and energy use associated with shipping the spent resin for treatment.



Savings & Efficiencies

- **1+ year in operation at 100-DX facility without a resin change**
- **120-160 resin change-outs avoided to date, cost savings of \$1.2-1.6 million**
- **\$120,000 saved on initial resin purchase**
- **\$20 million projected savings in treatment material over the 100-DX system's design life**
- **3 groundwater treatment facilities using new resin since December 2010**

For more information:

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Resin saving costs (cont.)

Using a resin skid designed to simulate the treatment vessels, CH2M HILL tested a series of resins that were previously demonstrated or reported to be capable of removing a toxic form of chromium, hexavalent chromium. The performance of the single-use resin SIR-700 demonstrated high capacity in side-by-side testing.

The resin was installed at the 100-DX Groundwater Treatment Facility where it operated over one year without a single resin change. With each change costing approximately \$10,000, that is a savings of approximately \$1.2-1.6 million. Disposal alternatives are being evaluated and may affect lifecycle cost estimates.

Based on the resin's effectiveness, CH2M HILL engineers also determined the number of operating vessels can be reduced while still achieving the desired capacity or treatment rate. This reduces the material needs at the current capacity but also makes available more vessels to increase the treatment capacity in the future.

The new resin has been installed at the 100-HX Groundwater Treatment Facility and is currently being tested for 100K Area treatment facilities.



Protecting the Columbia River

The 100 Area of the Hanford Site runs along the Columbia River and contains Hanford's nine production reactors. Over time, the soil and groundwater became contaminated with chromium because of leaks in the reactors' dichromate transfer systems and piping and periodic discharges to the soil. Groundwater treatment facilities at Hanford will remove the primary contaminant of concern – hexavalent chromium – and help DOE contain chromium contamination and prevent it from reaching the Columbia River.

For more information about groundwater treatment at the Hanford Site, visit:

www.hanford.gov
www.platauremediation.hanford.gov