RADIUM REMOVAL FROM DRINKING WATER

Model - RAD-CLEAN SYSTEM-600

FEATURES:

- BRINGS RADIUM-226, 228 TO **2.5 pCi/l**
- REDUCES HARDNESS OF WATER
- LOW LIFECYCLE COST
- CHANGE MEDIA EVERY 8 TO 10 YEARS
- NO WORRY ABOUT TOXIC WASTE DESPOSAL
  Periodic Back-flush to Waste Water Treatment Plant.
- URANIUM REMOVAL ALSO AVAILABLE
- SMALL SYSTEMS EXPERTS
- INSTALLATION AND SERVICE ANYWHERE IN USA

PROBLEM:

The **USEPA** regulates drinking water quality and has set the standard for Radium 226 and Radium 228 in drinking water of no more than 5 pCi/l.

In recent years the presence of radium in drinking water above this limit is a common occurrence.

SOLUTION:

- **Dilution** of the drinking water with radium-free water
- **Reverse Osmosis**
- **Ion Exchange**

Technical Associates evaluated the above potential solutions using the following parameters:

- Maintenance requirements
- Life cycle costs
- Installation
- Feasibility of service calls
- Disposal of radium contaminated material

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RADIUM SPRINGS, WYOMING

EVALUATION OF THREE METHODS:

DILUTION: The expression "Dilution is not the solution for pollution" is a true statement regarding radium removal.

- Radium is not removed but diluted in concentration.
- Using a water source radium free is required.
- Piping and delivery of uncontaminated water is required.

REVERS OSMOSIS: Would remove radium and other dissolved minerals and salts.

- Requires significant energy to maintain process.
- Technical process.
- High costs of initial set up, maintenance, and life cycle,

ION EXCHANGE: Cost effective and most Waste Water Treatment Plants receive and treat the waste stream from the Ion Exchange process.

- Available nation-wide.
- Wide variation of flow volume
- Small space requirement

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DISCUSSION OF ION EXCHANGE PROCESS:

Radium ions are cations, ions with positive charges, as are calcium, magnesium and several other metal ions. These ions are very strongly attracted to the media utilized in the RAD-CLEAN SYSTEM 600, even more so than Calcium, Magnesium, and other cations representative of hardness in water.

Back-flushing & Regeneration: When the tanks are back-flushed and the Ion Exchange capability is regenerated, the hardness ions will become unattached to the media and be flushed out of the system to a drain. During regeneration, most of the radium is also pulled off the media and flushed out of the system.

Typically the local Wastewater Treatment Plant(s) (WWTP) receive and treat the waste stream from the ion exchange process.

Because of the strong attraction the radium ions have for the media, not all the radium will be removed from the resins. Over time, the resins become saturated with radium ions that have not been removed during regeneration.

Replacement of Media 8-10 years: Once this condition occurs, the media must be removed and disposed of properly. New media is loaded into the tanks. This replacement of the media will only need to be replaced after eight to ten years.

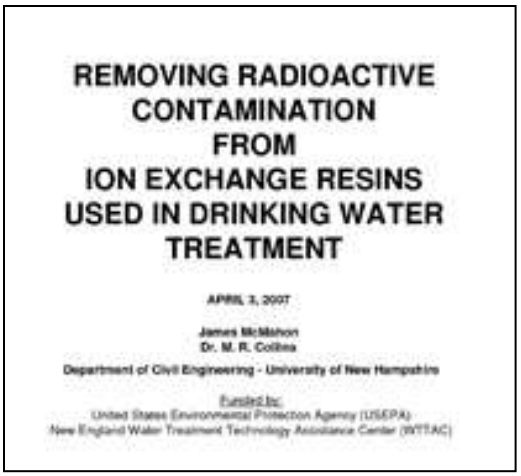
Service of RAD-CLEAN SYSTEM 600: Another advantage of using ion exchange systems is that service is readily available nationwide. TA regional and local support system will ensure the system is maintained properly and that the exchange media will be disposed of properly.

Cost Effective: The ion exchange method is cost-effective both in start up and during life cycle maintenance.

Flow Volume: Because of the wide variation of flow volumes, the typical system operates with one module during times of low-flow. During high-flow conditions the second module automatically is brought on line.

System Footprint: The floor space needed for the typical small system user is about 20 ft^2.

Old School Radium Removal



REMOVING RADIOACTIVE CONTAMINATION FROM ION EXCHANGE RESINS USED IN DRINKING WATER TREATMENT

APRIL 3, 2007

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Funded by:
United States Environmental Protection Agency (USEPA)
New England Water Treatment Technology Assistance Center (WTTAC)

2007

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SPECIFICATIONS:

One TADR-M-150-2 progressive flow water Softener with meter controlled regeneration.

Includes:

- Qty 2 – 5 cubic foot steel resin tank
- Qty 2 – MVP control
- Qty 2 – Meter assembly and cable
- Qty 1 - Brine (salt storage tank) 24 x 50
- Qty 1 - Initial salt fill (400 lbs/ten 40 lb bags)

Flow Rate: Typical 500 GPM
Total Flow: 7,500 gallons per day

SYSTEM COSTS: Purchase, Installation, and Maintenance

***System Price**	Base Price
****Set up, Startup**	Labor
Total Cost	Total
Annual Salt costs	Annual
Contractor will provide details	
Annual Single Unit Costs	**Request Pricing**

***** The prices listed are for the equipment and components listed as standard with the equipment specified above.

Does not include chemicals or other parts or associated systems unless otherwise listed. This does not include piping of any kind.

****** Load & Set includes loading of mineral into resin tank, installation of hub and distributor, mounting of control head, and setting in place to be plumbed to.

Prices will be computed on one visit. Additional service visits will be charged.

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