

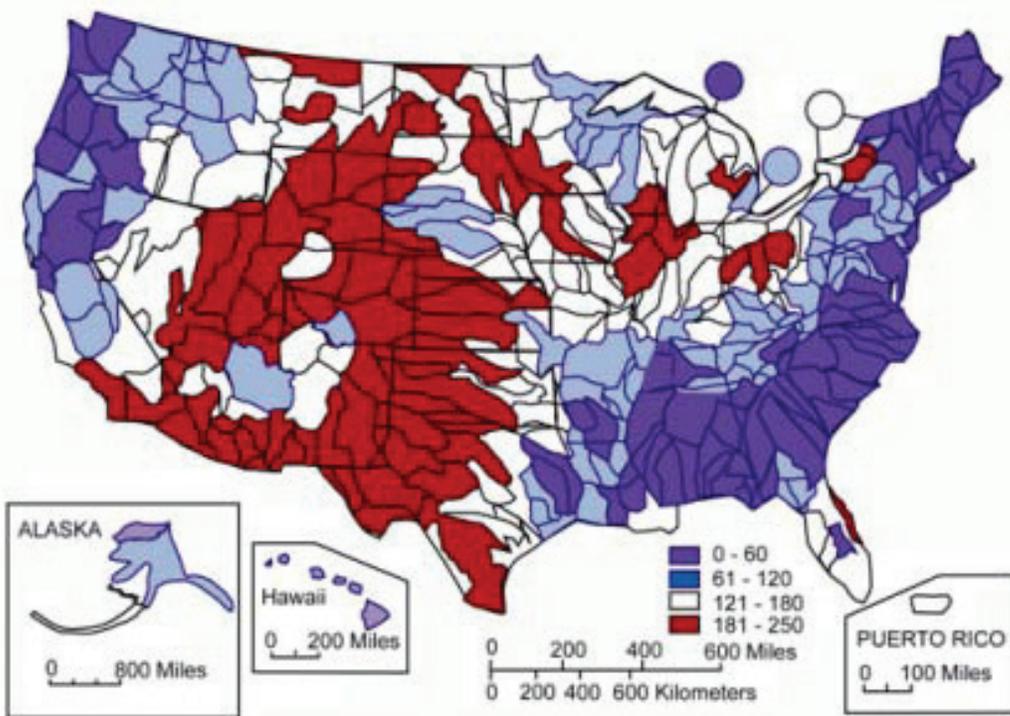
# REDUCING SALT DISCHARGE AMOUNTS BY NEARLY HALF

New independent study demonstrates successful approaches

## A look at the Optimization of Water Softeners for Reduced Influent Chloride Study

### US Water Hardness

#### Concentration of Hardness as Calcium Carbonate, in Milligrams Per Liter



Mean hardness as calcium carbonate at NASQAN water monitoring sites during the 1975 water year. Colors represent streamflow from the hydrologic-unit area. Map edited by USEPA, 2005. Modified by Briggs and others, 1977. (USGS 2013)

### Interesting Insights

Optimization of water softeners can cut chlorides by more than a quarter, and replacement of older systems with newer, efficiency-rated ones can lead to a reduction of nearly half.

### Goals of the Study

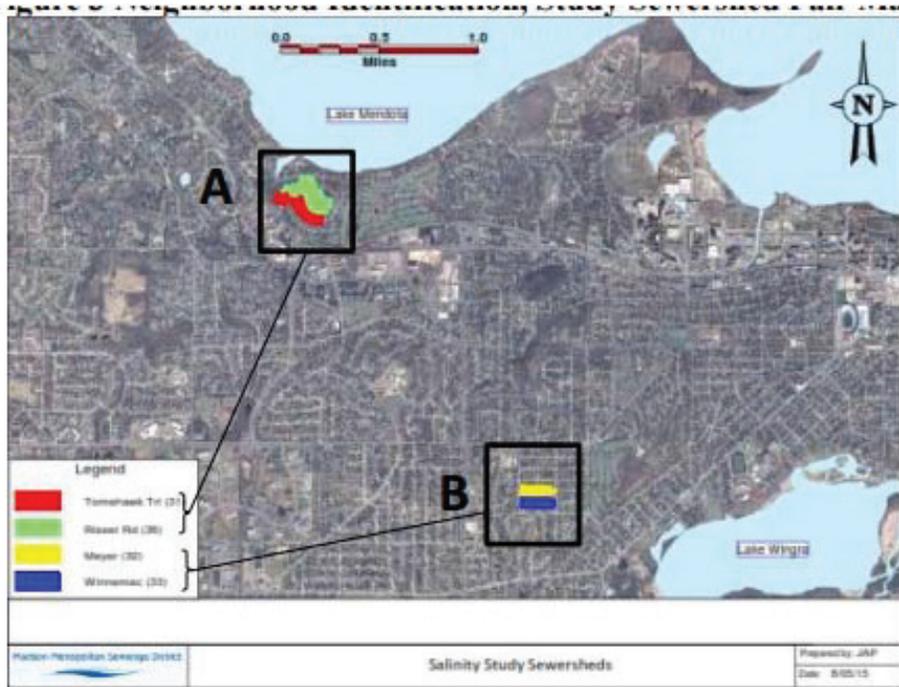
The Water Quality Research Foundation (WQRF) partnered with the Madison Metropolitan Sewerage District (MMSD), in Madison, Wisconsin, to study a potential strategy for meeting discharge requirements in areas with high chloride levels. The MMSD used the results of this study to develop a softener

efficiency optimization and replacement program which can serve as a national model for other utilities facing similar challenges.

### Method

Four sewersheds in two neighborhoods were studied over two periods in 2013-2014. These basins were selected to be monitored for chloride output in wastewater to local sewers. During the study, one portion of residents was offered free optimization of their existing water softeners and another was offered free replacement of their existing water softeners with a minimum efficiency of 4,000 grains hardness removed per pound of salt consumed. Comparisons were then conducted between those that received optimization and replacement and those that did not.

The neighborhoods selected were Spring Harbor and Glenway, shown in the map on page 2. In Spring Harbor, the two sewersheds used in the study were the



Tomahawk and Risser sewersheds. In Glenway, the two sewersheds chosen were Meyer and Winnemac sewersheds. Risser sewershed residences were offered free optimization of their existing softener and Meyer sewershed houses were offered free replacement of their existing water softener.

### Results

The final conclusions were that on **average, optimization could reduce chlorides by 27% while replacement could reduce chlorides by 47%**. There are instances where there are higher or lower savings.

### Chloride Mass Comparison Conclusions Phase 2, 2014 \*Average Chloride Mass in KGD per House

Control Sewershed	Treatment Sewershed	Control Average	Treatment Average	% Change	Comment
2014 Tomahawk	2014 Risser	0.278	0.204	-27	After softener changes, lower mass in Risser
2014 Winnemac	2014 Meyer	0.232	0.124	-47	After softener changes, lower mass in Meyer

### Discussion

Advances in ion exchange water softener technologies over the last few decades provide multiple benefits. Softeners provide energy savings (from reducing water heating needs), prevent scale damage to other home appliances, and can reduce detergent use by up to 70%. Softeners provide conservation benefits which have the potential to reduce a home's heating carbon footprint by as much as 14% per year (Water Quality Research Foundation, 2009). To sustain

reductions in salt use and other performance benefits, maintenance by a water treatment professional is important to maintaining equipment efficiency over the long term.

The full report is on the Madison Metropolitan Sewerage District Website: [www.madsewer.org](http://www.madsewer.org)

**Every industry has a common goal, to satisfy customers and protect its reputation.**

### Professional Certification

The WQA Professional Certification program helps consumers and employers identify individuals in the point-of-use/point-of-entry — at the tap or whole house water treatment — industry who have demonstrated a certified level of professional expertise and are dedicated to high professional standards. WQA education resources include technical and business basics for beginners and non-technical employees, theory and applications of water treatment technologies, specific residential applications, commercial sizing and application, and industrial applications. WQA education resources, available to all their members also include topics on plumbing basics, equipment installation guide, disinfection, and different approaches to system optimization. When looking at installing or optimizing water treatment, individuals can find certified professionals in their area through WQA's website at: [www.wqa.org](http://www.wqa.org).



### Product Certification

How can consumers feel confident that not only are they buying products to fit their demands, but that they also truly do what they say they are going to do? In many American industries, including water

treatment, the answer is simple, it is called “product certification.” Product certification can be loosely interpreted as a seal of approval. Often, an actual seal is placed on products to distinguish those that have met the various stringent requirements established. In most cases, certification is not simply passing a single test. In fact, when done right, product certification encompasses many aspects including such items as best practices, rigorous testing according to industry standards, and third-party oversight.



Certification is a reliable way an industry can direct consumers to products that most effectively do what they want.

### **More About the Water Quality Association**

The Water Quality Association advocates for the water treatment industry and its technologies. WQA members make and sell products such as treatment systems at the faucet, whole-house improvement devices, water softeners, and more. Their products fall under two different categories: point-of-use (POU) and point-of-entry (POE) systems that improve water quality in a home or business.

WQA Gold Seal Certification Program is dedicated to providing public health and safety services throughout the USA and globally, and maintaining expert service, superior reputation, and fair pricing.

### **The Water Quality Association's Water Treatment Industry Toolkit**

The Water Quality Association provides these facts sheets and resource guides as a service to its members, policymakers, and the general public. They are designed to promote discussion on key issues through facts and data.

### **Learn more**

- Water Quality Research Foundation - [www.wqa.org/WQRF](http://www.wqa.org/WQRF)
- Madison Metropolitan Sewerage District - [www.madsewer.org](http://www.madsewer.org)
- Water Quality Association - [www.wqa.org](http://www.wqa.org)
- WQA Gold Seal - [www.wqa.org/goldseal](http://www.wqa.org/goldseal)
- WQA Modular Education Program - [www.wqa.org/MEP](http://www.wqa.org/MEP)

---

**WQRF** | **Water Quality  
Research Foundation**

The bottom of the page features several thick, wavy blue lines that flow across the width of the page, creating a dynamic, fluid background for the footer area.