Scott Przybilla
City of Marshall

Carolyn Dindorf
Bolton & Menk, Inc.

Morning Speaker August 1

Our Path to Chloride Reduction

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SALT SYMPOSIUM

Our Path to Chloride Reduction

Salt Symposium, August 1, 2023

MARSHALL
CULTIVATING THE BEST IN US

Scott Przybilla
Assistant Superintendent/WWTF
City of Marshall, Minnesota

Carolyn Dindorf
Limnologist
Bolton & Menk, Inc.

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Where We Were

* 2012 notified by MPCA of 261 mg/L monthly average chloride
* Source reduction only way to meet limit
* Began working with industries to reduce their chloride contribution.

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Where We Were

* Permit was finalized in April 2014. We received a 10 year schedule of compliance (SOC)

* At that time, we were down to a monthly average of 563 mg/L.

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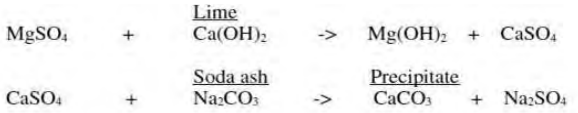
How We Got to Where We Are

* 2017 study done to determine feasibility of further softening at Marshall Municipal Utilities Water Treatment Facility (MMU).
* Eligible for a Point Source Implementation Grant (PSIG) of $7,000,000.
* July of 2019 accepted an $11.6 million bid
* PSIG covered some and the remaining was split between MMU and the City.
* March 2021 treatment started - 35 grains down to ~8 grains.



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How We Got to Where We Are

* We informed industrial users of the change in water hardness.

* Varying responses from industry.

    * Some had failing softeners that they were not planning on replacing so they removed them.

    * One is replacing RO membranes more often instead of purchasing a new softener to pretreat before the RO system.

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How We Got to Where We Are

* The further softening at MMU was only the first step and probably the easiest step.

* Without adjusting softeners down, we still would not meet goal

* June 2021 we announced to the public that the water being delivered to homes and businesses was at 8 grains hardness.

How We Got to Where We Are

* Radio and newspaper ads were used
* City staff contacted hotels, churches, retail stores, etc
* Initial drive was to change hardness settings to 8
* Some reduction in chloride but not enough

How We Got to Where We Are

* Fall of 2021 we were approached by Bolton & Menk about a chloride reduction program offered through the MPCA.

* Bolton & Menk applied for the grant to be used by both Worthington and Marshall.

* Each program is a little different based on what each entity identified as the best way to approach reductions.

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Chloride Reduction Grant

* $250,000 grant from MPCA to Bolton & Menk
* Partners: Marshall and Worthington, 25% match
* $200,000 designated for replacement & optimization rebates ($100,000 each city)
* Program began March 2022

Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR) and administered by the MPCA.

MINNESOTA POLLUTION CONTROL AGENCY

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

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Rebate Program

* Water softening companies and plumbers recruited – 4 participating
* Contractors trained on program details and water softener optimization
* Contractors assessed existing softener for replacement eligibility or optimization
* Complete calculations showing salt reduction

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Rebate Program

* Applicant calls approved contractor
* Contractor visits site-
  optimizes or replaces softener
* Applicant pays contractor
* Applicant applies to City for rebate
* Contractor submits paperwork to City

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Rebate Program

* Optimization: free for residents/businesses (payment to contractors)

* Replacement rebates:
  * Residential: $500 or $700
  * Commercial based on water use: $500 to $4,000

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Rebate Program

* Rebate Forms
* Residential & Commercial
* English & Spanish

MARSHALL

Residential Water Softener Rebate Program A

You may apply online at http://ci.marshall.mn.us/rebate or submit this appl documents by email to Jazmin.Meza@ci.marshall.mn.us, or mail to Wastew Jazmin Meza, 600 Erie Rd, Marshall, MN 56258. Check the website or call 5

APPLICANT:

Name: _____

Installation Address: _____

City: _____ State: _____ Z

Daytime Telephone: _____ Email: _____

Send rebate check to (if different than above address)

Address: _____

City: _____ State: _____ Z

WATER CONDITIONING VENDOR/CONTRACTOR INFORMATION

Name: _____

Address: _____

City: _____ State: _____ Z

PRODUCT INFORMATION

Old Water Softener

Manufacturer: _____ Model Number: _____

Estimated Age: _____ Estimated number of bags of salt used

INSTALLATION OR MODIFICATION COMPLETED

__Softener Replaced *4000 - 4999 gr/lb* ($500) __Softener Replaced *> or = 500*

__Salt-free Conditioner Installed (Requires pre-approval)

Rebate amount: _____

IMPORTANT: Include copy of receipt & required documents from the dealer that installed the new equipment.

SIGNATURE REQUIRED

I, _____ certify that I meet the program eligibility requirements, and that the information provided is true and correct, that the product was installed at the installation address provided above, and that the product meets the requirements of this rebate program.

Signature _____ Date _____

Rebate application and documentation must be submitted no later than 4/30/24. Funds are subject to availability. Check rebate website to make ensure funds are still available.

WATER SOFTENER REPLACEMENT REBATE SCHEDULE:

FACILITY	AVG. MONTHLY WATER USE (GAL)	REBATE
Commercial 1 (small business, 4000 - 4999 gr/lb salt efficiency)	<20,000	$500
Commercial 1 (small business ≥5000 gr/lb)	<20,000	$700
Commercial 2 (e.g. 5 unit apt. bldg. and up)	20,000 - 150,000	$1,000
Commercial 3	150,001-300,000	$1,500
Commercial 4	300,001 - 1,500,000	$2,000
Commercial 5	1,500,000 - 3,000,000	$3,000
Commercial 6	>3,000,000	$4,000
Replace softener with a salt-free water conditioner, including reverse osmosis	Requires pre-approval	Commercial 1: $700 Commercial 2 - 6: 1/3 of cost up to $4,000

WATER SOFTENER MODIFICATION REBATE SCHEDULE:

MODIFICATION	ELIGIBLE	REBATE
Addition of brine reclaim system	Commercial 2-6	25% of cost up to $500
Addition of a blending valve (set to result in a hardness greater than 2 grains)	All	25% of cost up to $200

REBATE PROGRAM STEPS:

Contact a city-approved water softening/conditioning contractor to inspect your water softener to determine if it can be optimized for salt use or is eligible for replacement. A list of approved contractors can be found here: http://ci.marshall.mn.us/rebate.

Contact Marshall Municipal Utilities at 507-537-7005 or info@marshallutilities.com (or check your account online) and request the most recent year of monthly water use information and provide this to the contractor.

If the water softener can be optimized and is not eligible for replacement, have the contractor complete the optimization (adjust hardness settings, salt dose, and other settings for lower salt use).

If it is eligible for replacement, you may have that contractor complete the installation or get additional bids from the approved contractor list and choose one to complete the installation.

Hire an approved contractor to install a new water softener. Make sure the installer adjusts the hardness setting to match the current 8 grains/gallon hardness and optimizes the softener for low salt use.

Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR) and administered by the MPCA.

MINNESOTA POLLUTION CONTROL AGENCY

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

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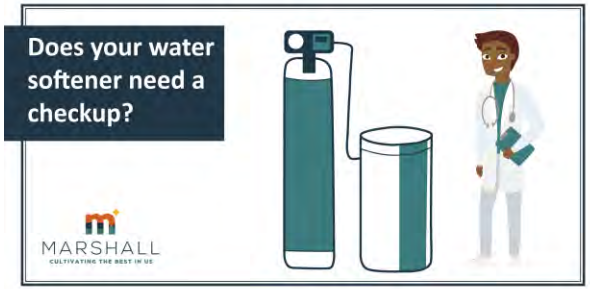
Program promotion

* Bolton & Menk worked with City and prepared promotional materials
* Promotion began July 2022
  * Social media posts
  * Newspaper ads
  * Radio ads
  * Chamber newsletter articles
  * Utility insert
  * Video



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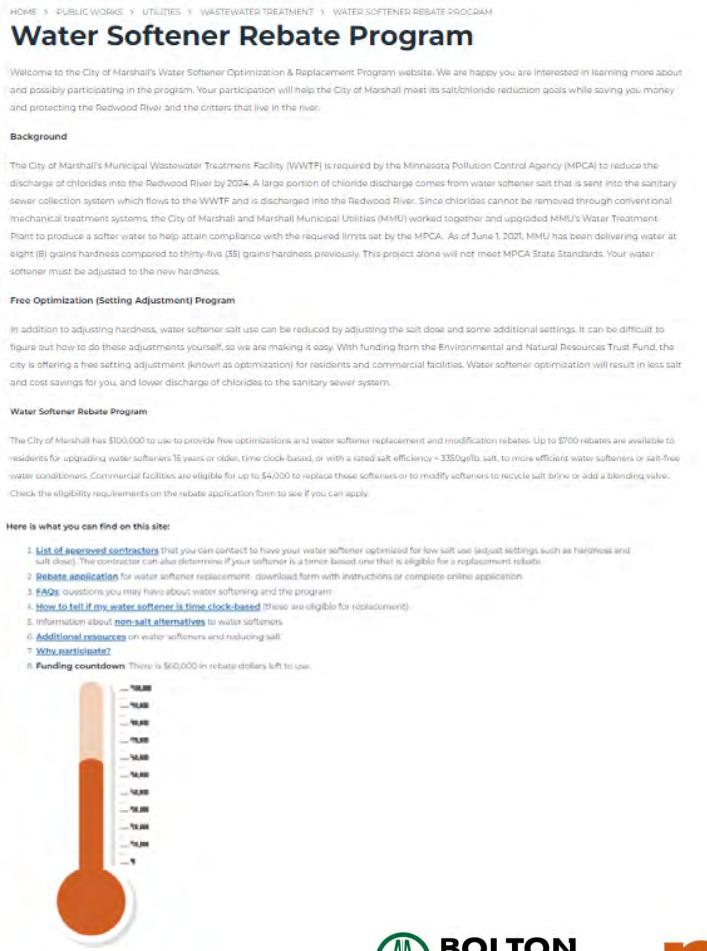
Program promotion

* Website Content
  * Approved contractors
  * Rebate application
  * FAQs
  * How to tell if my softener is time-clock based
  * Non-salt alternatives
  * Additional resources
  * Why participate?
  * Funding countdown



HOME › PUBLIC WORKS › UTILITIES › WASTEWATER TREATMENT › WATER SOFTENER REBATE PROGRAM

Water Softener Rebate Program

Welcome to the City of Marshall's Water Softener Optimization & Replacement Program website. We are happy you are interested in learning more about and possibly participating in the program. Your participation will help the City of Marshall meet its salt/chloride reduction goals while saving you money and protecting the Redwood River and the critters that live in the river.

Background

The City of Marshall's Municipal Wastewater Treatment Facility (WWTF) is required by the Minnesota Pollution Control Agency (MPCA) to reduce the discharge of chlorides into the Redwood River by 2024. A large portion of chloride discharge comes from water softener salt that is sent into the sanitary sewer collection system which flows to the WWTF and is discharged into the Redwood River. Since chlorides cannot be removed through conventional mechanical treatment systems, the City of Marshall and Marshall Municipal Utilities (MMU) worked together and upgraded MMU's Water Treatment Plant to produce a softer water to help attain compliance with the required limits set by the MPCA. As of June 1, 2021, MMU has been delivering water at eight (8) grains hardness compared to thirty-five (35) grains hardness previously. This project alone will not meet MPCA State Standards. Your water softener must be adjusted to the new hardness.

Free Optimization (Setting Adjustment) Program

In addition to adjusting hardness, water softener salt use can be reduced by adjusting the salt dose and some additional settings. It can be difficult to figure out how to do these adjustments yourself, so we are making it easy. With funding from the Environmental and Natural Resources Trust Fund, the city is offering a free setting adjustment (known as optimization) for residents and commercial facilities. Water softener optimization will result in less salt and cost savings for you, and lower discharge of chlorides to the sanitary sewer system.

Water Softener Rebate Program

The City of Marshall has $100,000 to use to provide free optimizations and water softener replacement and modification rebates. Up to $700 rebates are available to residents for upgrading water softeners 15 years or older, time clock-based, or with a rated salt efficiency < 3350grs/lb. salt, to more efficient water softeners or salt-free water conditioners. Commercial facilities are eligible for up to $4,000 to replace these softeners or to modify softeners to recycle salt brine or add a blending valve. Check the eligibility requirements on the rebate application form to see if you can apply.

Here is what you can find on this site:

1. List of approved contractors that you can contact to have your water softener optimized for low salt use (adjust settings such as hardness and salt dose). The contractor can also determine if your softener is a timer-based one that is eligible for a replacement rebate.
2. Rebate application for water softener replacement- download form with instructions or complete online application
3. FAQs: questions you may have about water softening and the program
4. How to tell if my water softener is time clock-based (These are eligible for replacement)
5. Information about non-salt alternatives to water softeners
6. Additional resources on water softeners and reducing salt
7. Why participate?
8. **Funding countdown**: There is $60,000 in rebate dollars left to use.

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Program Participation

* 137 Applicants
* 70+ **Optimizations**
  * 2 commercial
  * 67 residential

Water Softener Specifications
use to set salt dose

Rated Softening Capacity (Grains @ Salt Dose)	9,310 @ 1.8 lbs. 18,000 @ 5.8 lbs. 21,500 @ 9.7 lbs.
Rated Efficiency (Grains/Pound of Salt @ Minimum Salt Dose)	5,000 @ 1.8 lbs. 3,100 @ 5.8 lbs. 2,200 @ 9.7 lbs.

Minimum 4,000 grains/lb.

Part B. Optimization

Note: The City of Marshall reserves the right to spot check the contractor's work for compliance.

Water Softener Settings Section			☐ Check this box if settings cannot be optimized due to due to style or age.
	Initial	Optimized (set to 8 gr)	
Hardness Setting (grains per gallon)			
Resin Volume (cu-ft)			
Salt Dose (pounds/cu-ft resin)			
Salt Use (pounds/regen)			
Reserve Capacity (gallons) Note if automatically calculated			
Total Capacity (gallons)			
Est. Salt Consumption (lbs/mo)			
Other notes on water softener settings, adjustments, or suggestions for reducing salt use:			

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Program Participation

- 67 **Replacements**
  - 66 Residential
  - 1 Commercial
- Total Salt Reduction
  - 144,000 lbs/year
- Chloride Reduction
  - 86,000 lbs/year
  - ~90% reduction

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How We Got to Where We Are

* Initially, rebates for timer-based softeners were offered.

* Early on in the effort it was realized that there weren't many participants in the replacement part of the program.

* Most companies struggled with doing the assessment properly.

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How We Got to Where We Are

* After 3 months it was decided to allow the replacement rebate for any softener that was ≥15 years old.

* Program has been extended by another year. The program will end June 30, 2024.

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Reduction Grant Challenges Experienced

* Training needed to be more in depth.
* Salt dosage (lbs/ft^3) and capacity (grains per regen) were difficult concepts for dealers
* Most basic softeners make it easy to adjust hardness.
* Salt dosage is set by factory to maximize capacity (grains per regeneration).
* As salt dosage increases the max capacity does not increase at a linear rate.

FL Water Technologies, Inc.

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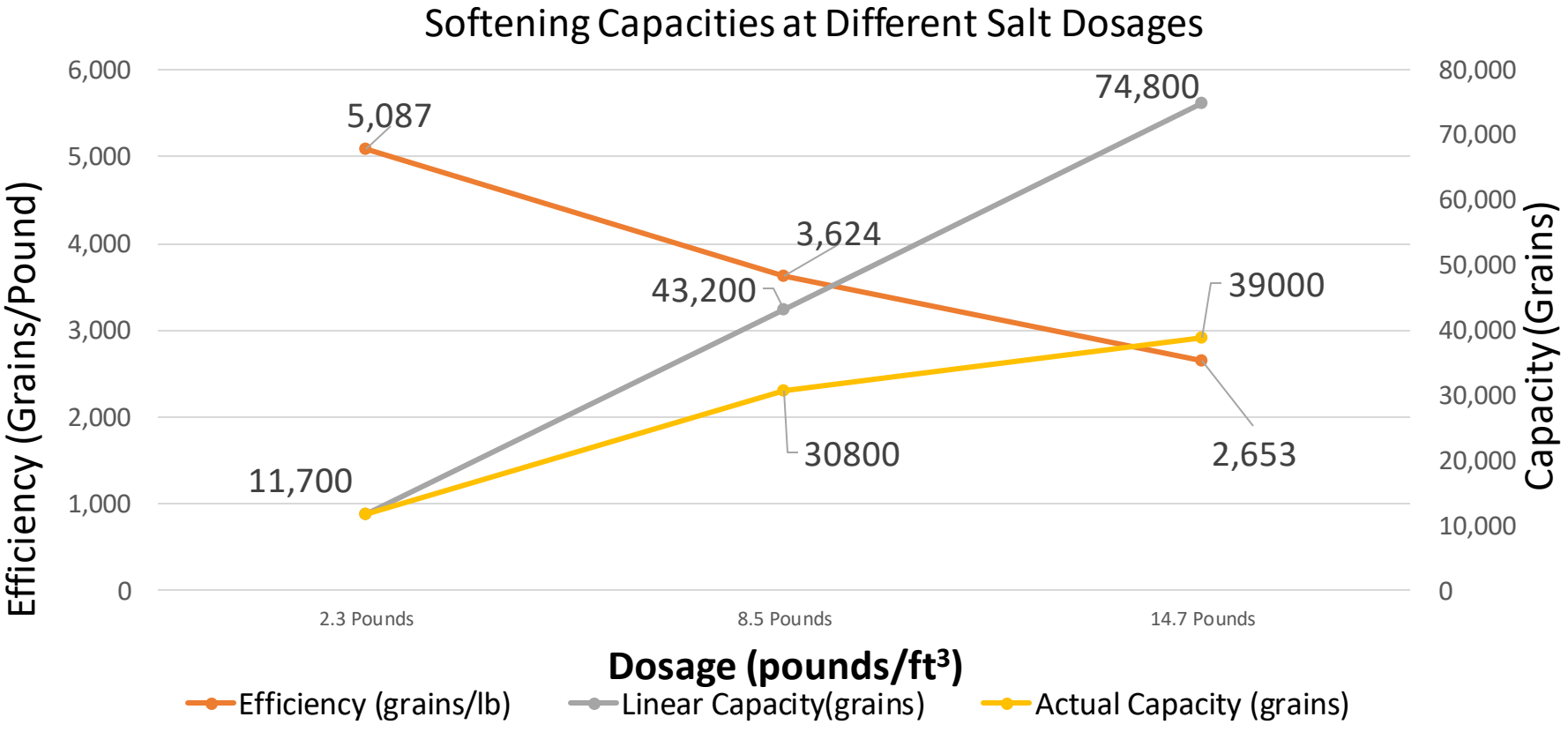

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Reduction Grant Challenges Experienced

* New digital softeners are intuitive and easy to set/adjust salt dosage. Old ones are a bit more complicated.

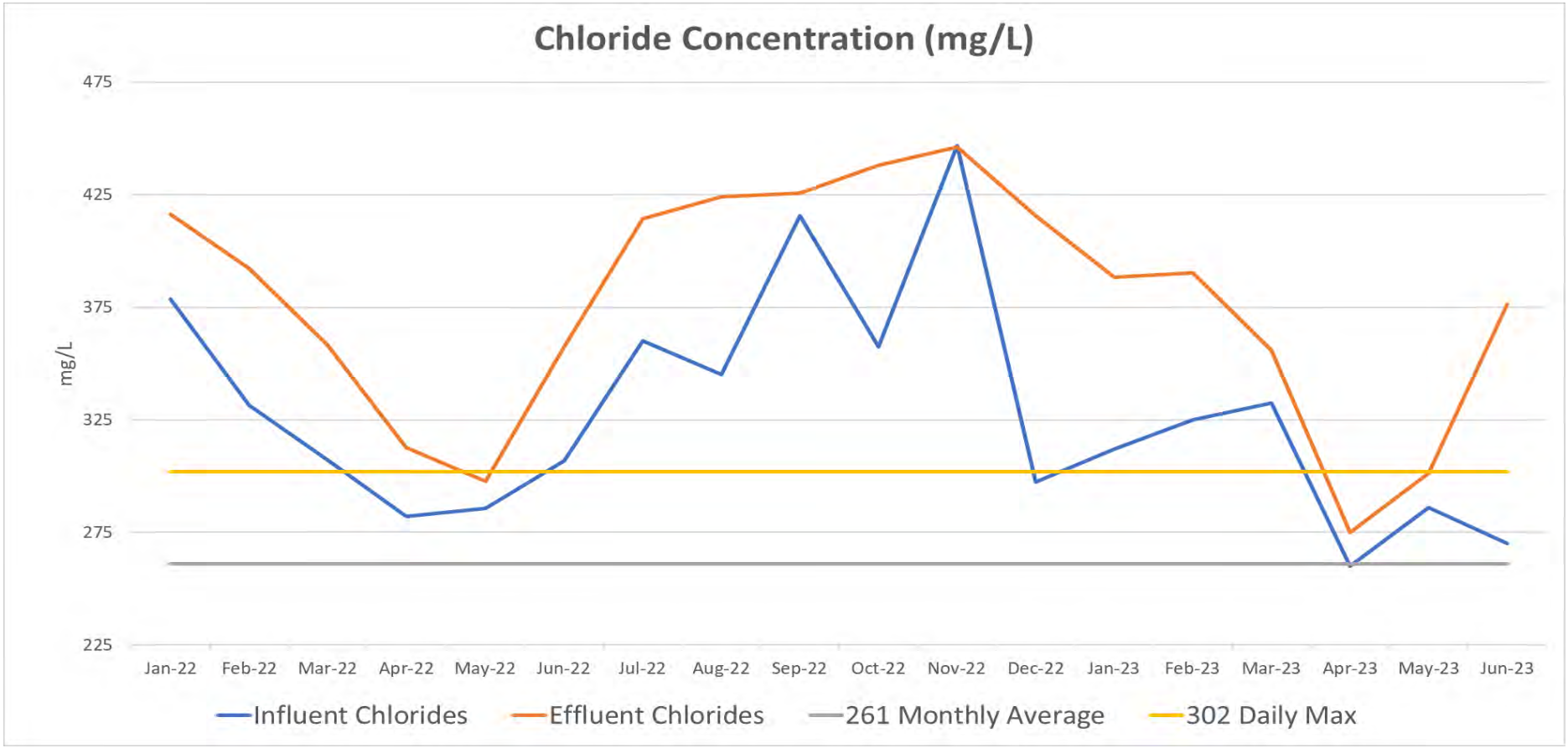
* Salt dosage is set in several different ways depending on softener.

* Regardless of how salt dosage is set, ~3 pounds of salt can dissolve in 1 gallon of water so salt dosage is controlled by how much water is put back into the brine tank.

* Because there is no setting using pins or timers on some older softeners the salt dosage wasn't always set correctly during optimizations.

Reduction Grant Challenges Experienced

* Incomplete forms submitted
* Visited contractors to discuss requirements
* Received complete forms after



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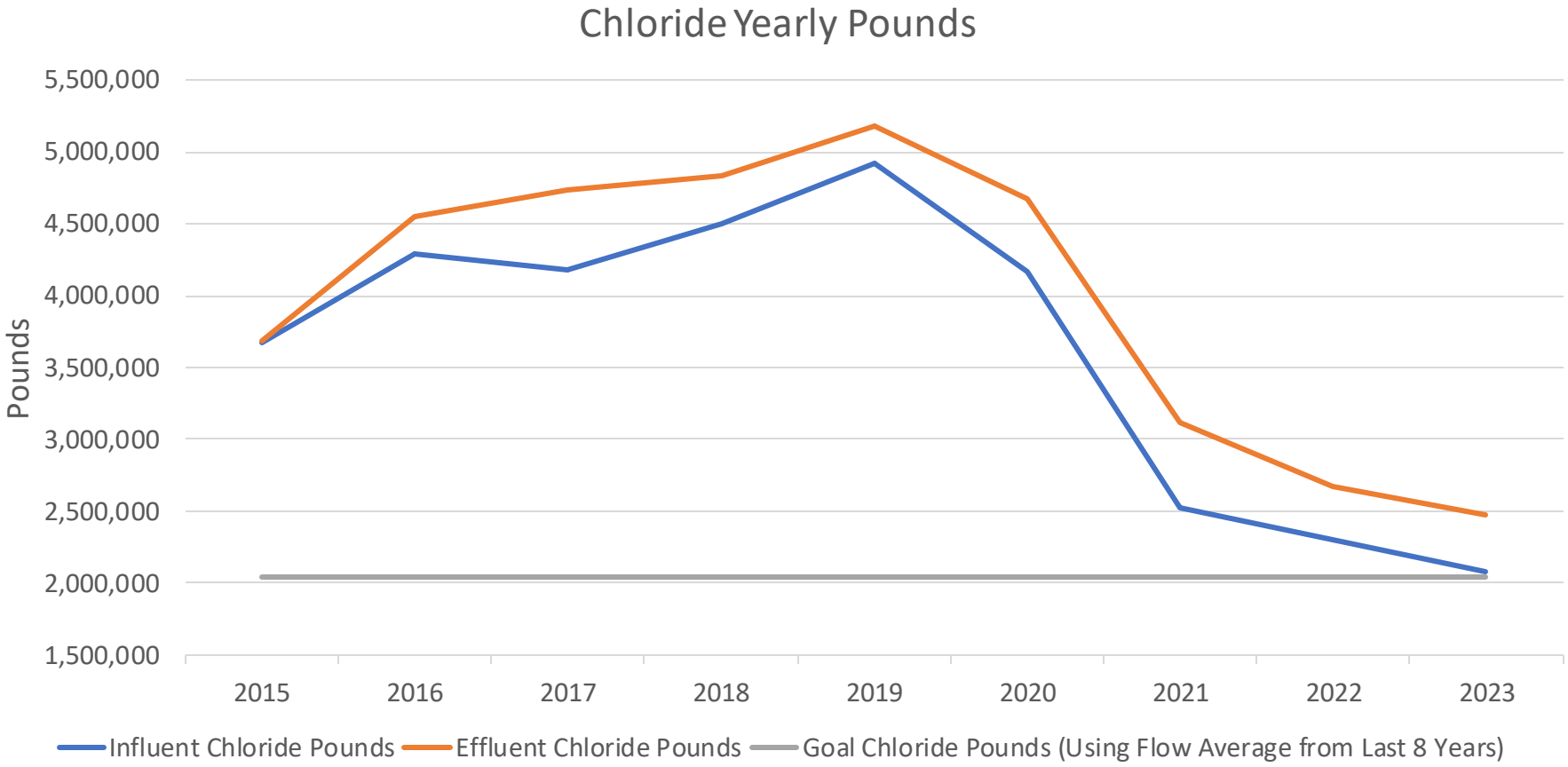

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Continuing Challenges

* Two industrial sources are still working on reductions.

* A 5 gpm stream is extremely high in chlorides (17,000 mg/L) so they are in the process of severing that stream from the flow that we receive from them.

* One is investing in new equipment which will allow the capture of brine for reuse and better designed equipment for preparation of solutions used in their product.

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Continuing Reductions

* SOC ends April 1, 2024
* Variance has been applied for
* Continuing to work on reductions
* Budgeting to continue rebates after the grant ends

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Program Summary

* City water reduced to 8 grains/gallon hardness
* Rebate program created- grant funds
* Recruited dealers/plumbers to help
* Notified public, businesses and industries of hardness change
* Participation mostly residential
* Estimated chloride reduction of 86,000 lbs/yr

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Program Summary

Lessons learned:

* Dealers/plumbers need more in-depth training
  * Bolton & Menk will be working with MPCA to develop full day training
* Ongoing promotion needed to keep interest
* Difficult to get commercial participation
* Need more commercial/industrial reductions to meet limits

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Questions?

Scott Przybilla
Assistant Superintendent/WWTF
City of Marshall
Scott.Przybilla@ci.marshall.mn.us
507-537-6776

Carolyn Dindorf
Limnologist
Bolton & Menk, Inc.
Carolyn.Dindorf@bolton-menk.com
612-220-4999

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