Water Reduction at Federal Cartridge

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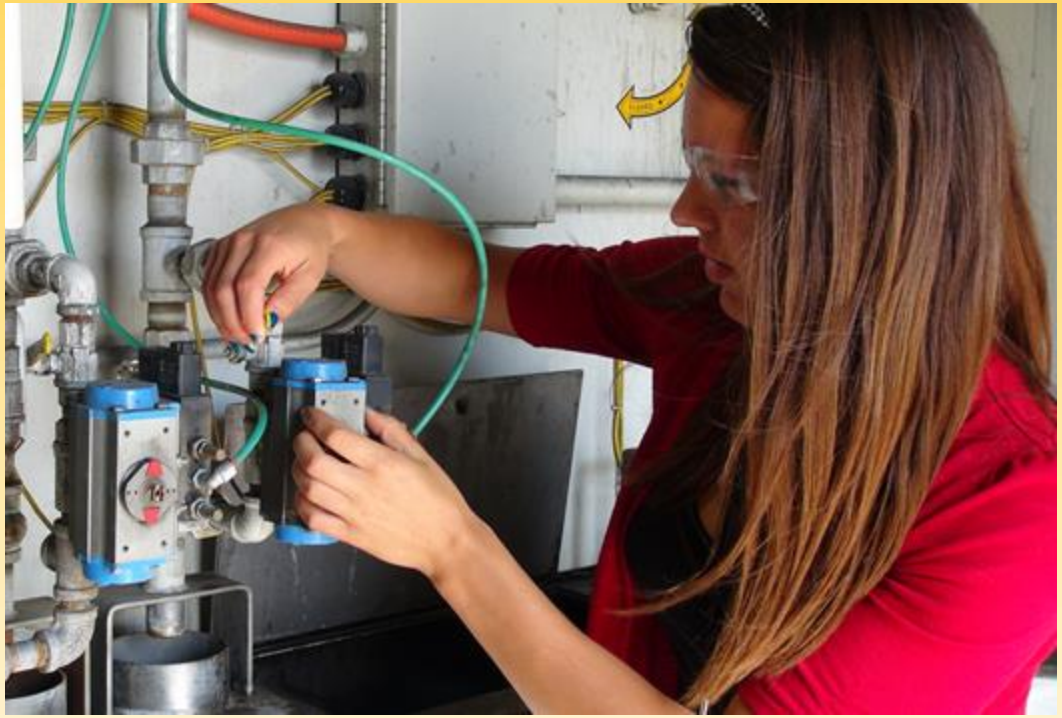
Driven to Discover℠

Project Overview

Project Goals

- Understand and update existing water data
- Develop best management practices
- Brainstorm water conservation and recycling options
- Suggest ways to reduce overall water use by 5%
- Encourage implementation



Federal Cartridge Overview

Small arms ammunition manufacturer

Divided into rimfire, centerfire, and shotshell areas

Headquartered in Anoka, MN on 175 acres with 1,700+ employees.

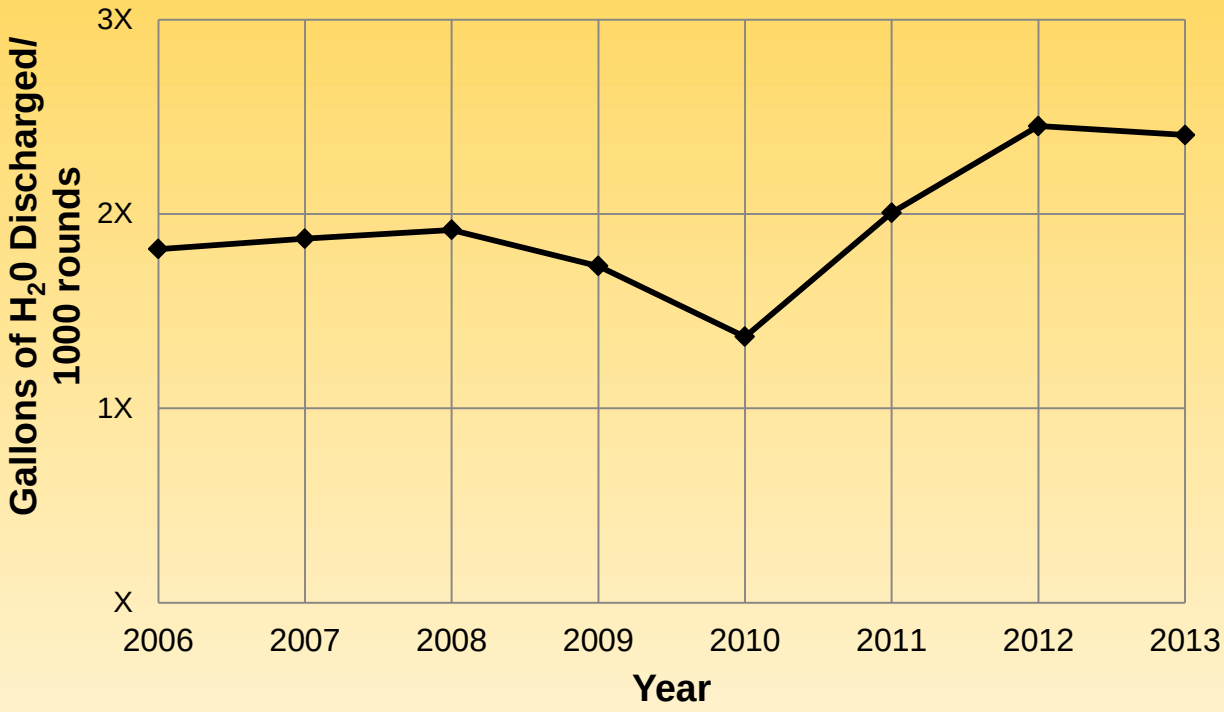
RIMFIRE

RIFLE

HANDGUN

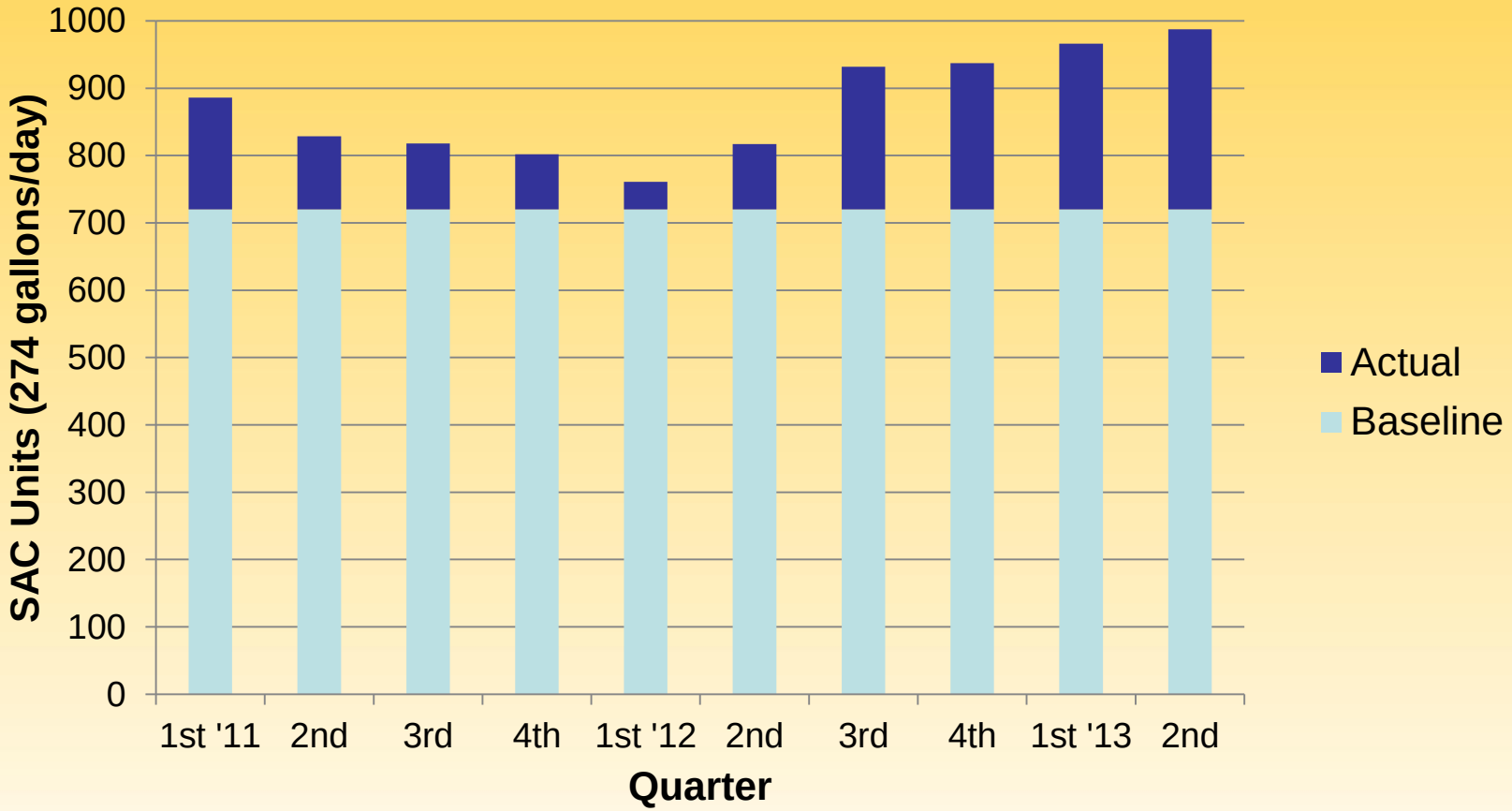
SHOTSHELL

Motivations for Change



- Lower cost of operation
- Avoid hydraulic capacity of WWTP
- Reduce impact on the environment
- Stay under SAC baseline

MCES SAC Issue



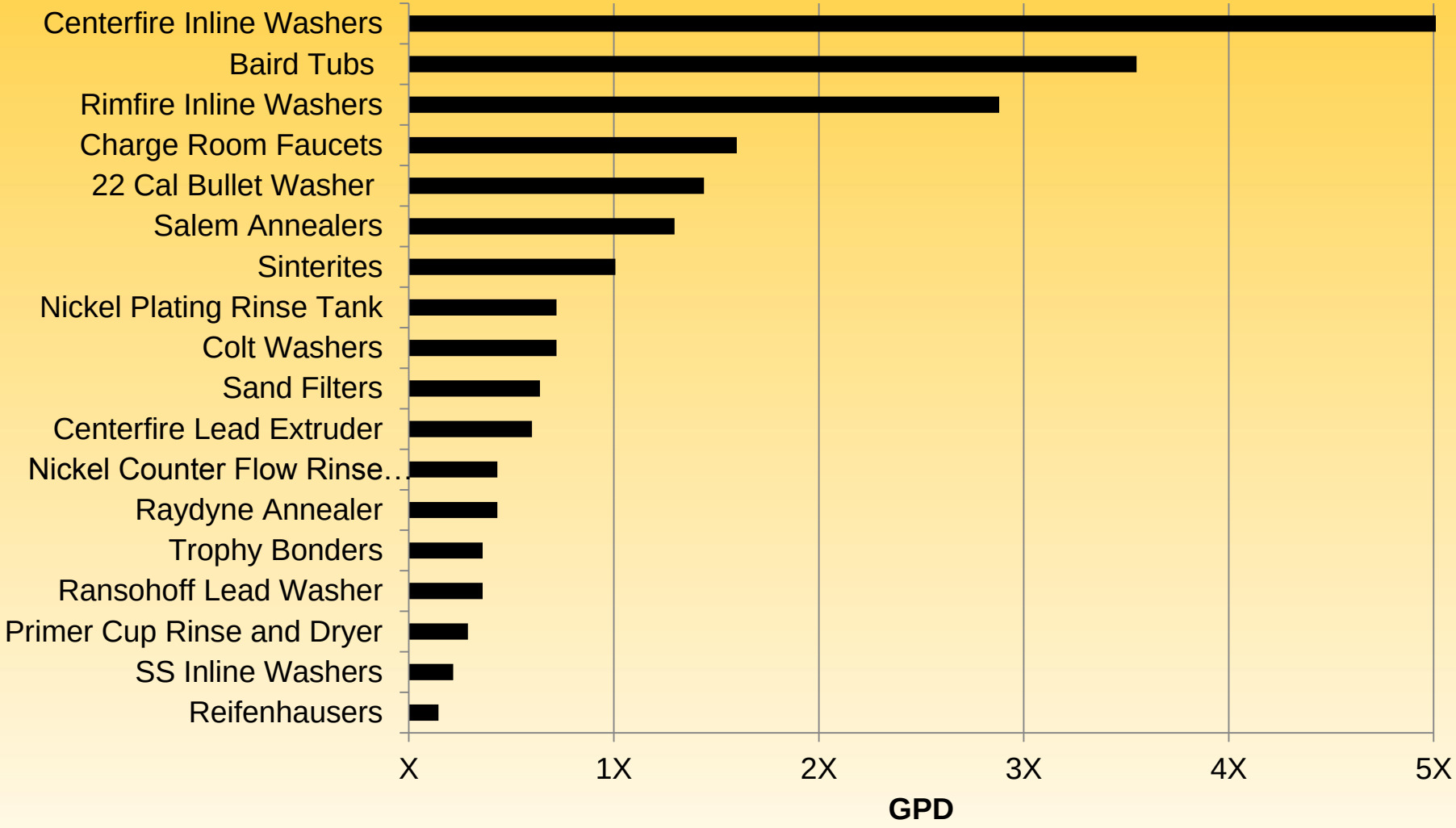
Cost of Water

Variable Cost		$ / 1,000 gal
Pumping Wells- Well water and soft water		0.37
Conditioning Water – Soft water only	Robert B. Hill Company	0.43
Boiler Room Chemicals- Well water only	U.S. Water Services	0.41
POTW Charges – Domestic water only	Anoka/Coon Rapids	2.42
Treatment Chemicals Federal WWTP	U.S. Water Services	2.03
Effluent Strength Charge	MCES	0.02
Sludge Dump Rental	PDC	0.36
Sewer Charge	Anoka/Coon Rapids	3.27
SAC Charges	MCES	8.12
Average (of well, soft, & city) Variable Cost		**15.13**

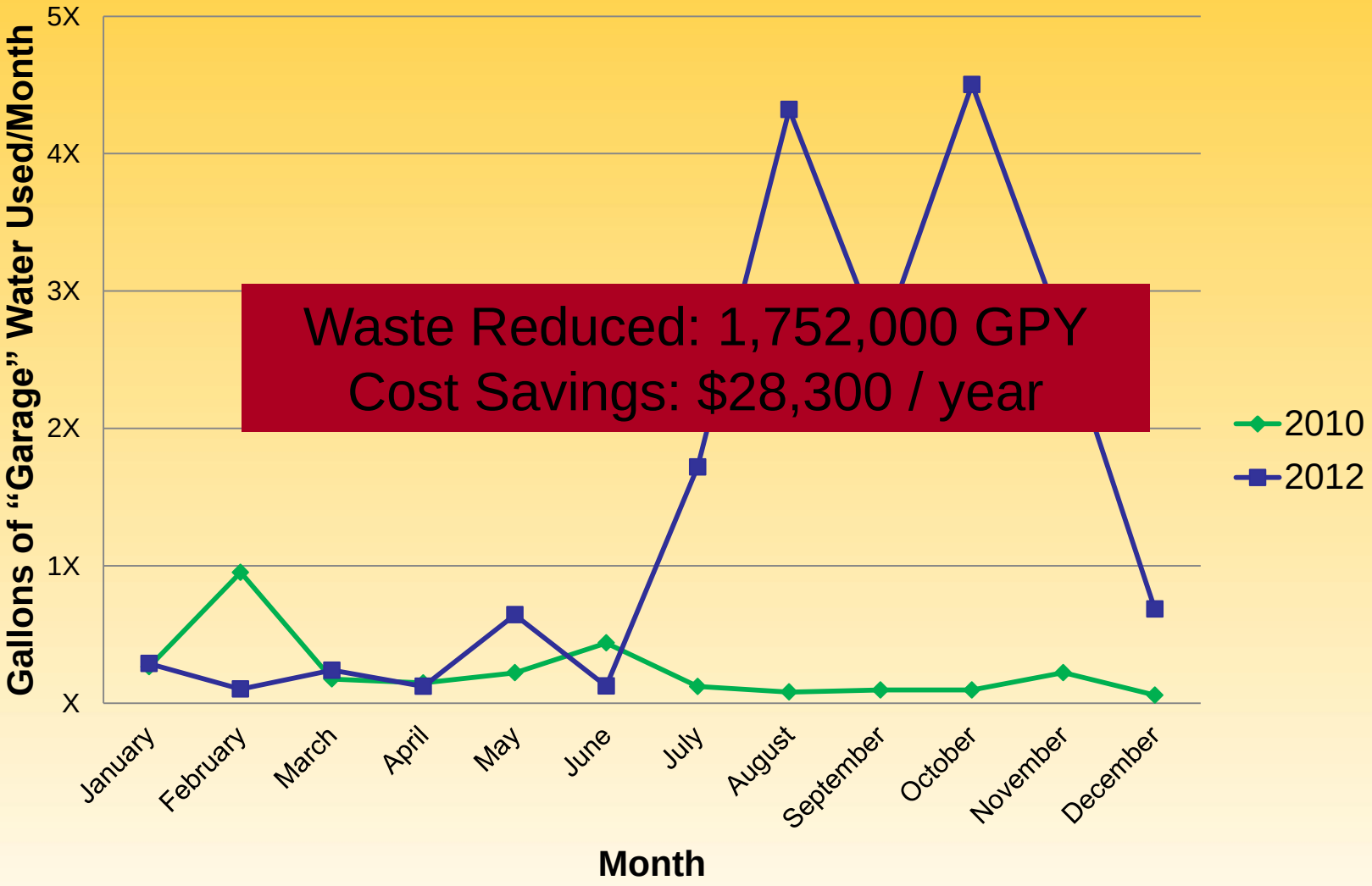
Lessons Learned

- Maintain piping to prevent clogging
- Lower chemical use
- Monitor valves after installation
- Communicate the importance of water control
- Implement engineering controls
- Use closed-loop systems or batch processes

Mapping Water Use



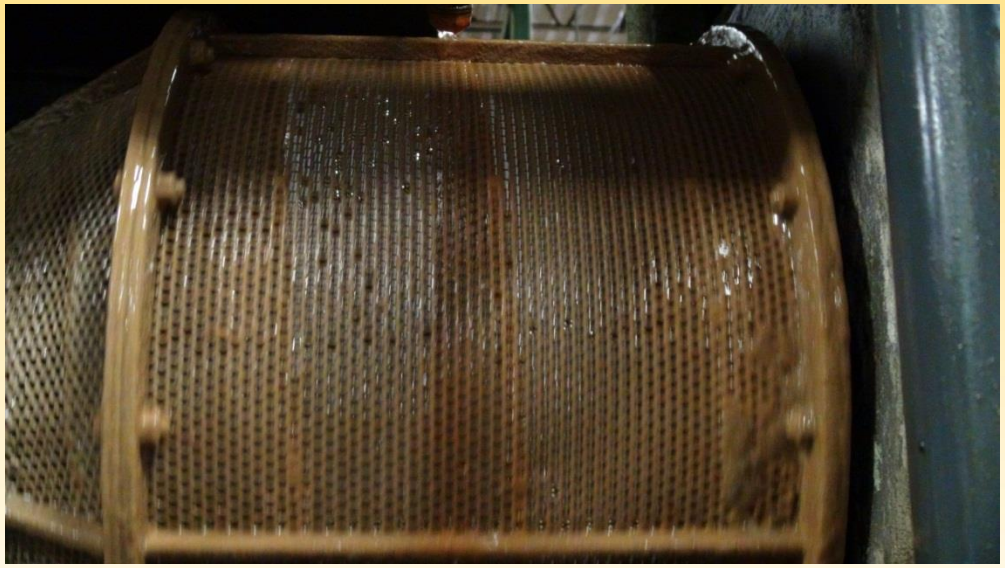
Recycle Effluent to Clean Sand Filters



Install Automatic Shut-offs on Washers

Photo by Kaylea Brase

Replace Open Hoses with Spray Nozzles



	Recommendation	Waste reduced (GPY)	Annual Savings	Status
1.	Remove redundant rinse cycle	652,200	$9,500	In progress
2.	Install faucet control	2,803,000	$40,900	Approved
3.	Install conductivity meter control	? Current flows @11,520 GPD	?	Equipment delivered
4.	Install automatic shut-offs on washers	778,500	$11,400	Waiting for Electrical
5.	Fix faucet leak	55,500	$800	Completed
6.	Recycle effluent to clean sand filters	1,752,000	$28,300	Waiting for Plumbing
9.	Invest in a chiller recycle loop	54,750	$11,700	Sent in purchase request
10.	Recycle rinse water used for cooling	692,000	$10,600	Awaiting approval
Total Water Conservation		7 million gallons water	$113,200	8-10% of facility water use

Personal Benefits

- Learned about many complex manufacturing processes
- Gained leadership experience
- Observed company dynamics and identified lean sigma values
- Communicated with operators, engineers, managers, and vendors

Thank you! Questions?