



# St. Paul Beverage Solutions



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## Organization Background

St. Paul Beverage Solutions (BevSo), formerly Schroeder Milk Company before being purchased by Dairy Farmers of America (DFA) in 2019, has been operating for 139 years. There are currently 284 employees working in the 200,000-square-foot facility. The primary product produced by BevSo is milk including Extended Shelf Life (ESL), High-Temperature Short-Time (HTST), and Ultra-High Temperature (UHT).



*“This internship not only allowed me to grow in my field of work, but it also allowed me to grow as a person and learn from those around me and the experiences I had. I am very grateful to both MnTAP and St. Paul Beverage Solutions for supplying this opportunity and wonderful learning environment.” ~ ZB*

## Project Background

At BevSo, water is used primarily for cooling and cleaning and can be found almost anywhere you look. The primary focuses of the project were changing single-pass cooling to closed-loop where possible, modifying the current bottle washer systems, and optimizing the Clean-in-Place (CIP) systems. The current water use of these three processes adds up to 21,000,000 gallons of water annually.

## Incentives To Change

The primary incentives to change were eliminating excess water use at the facility, optimizing procedures and automating simple systems, such as a changing a manually-operated valve to a solenoid valve triggered by a motion sensor.

which would save 1,200,000 gallons of water and \$10,600 annually. Additionally, BevSo could save up to \$2,700 each year in sewer availability charge (SAC) reductions.

## Utilize Existing Ammonia Chiller to Chill Aseptic Liquefier

The aseptic liquefier is used to blend flavors such as chocolate for production. Currently, the aseptic liquefier uses single-pass cooling. Connecting the aseptic liquefier to the existing ammonia chiller with insulated piping is recommended and would eliminate almost all water use associated with cooling except minimal amounts of water lost to cooling tower blowdown and evaporation. Implementing this solution would save 1,500,000 gallons of water, \$9,200 overall, and up to \$3,400 in SAC reductions annually.

## SOLUTIONS

### Automate Bottle Washers and Install Flow Orifices

The purpose of bottle washers within the facility is to clean off any excess product that may have spilled onto the cartons or bottles as they were filled. Installing solenoid valves, motion sensors, and flow orifices would eliminate the need for employees to operate hand valves and create a controlled, consistent flow rate throughout the system. BevSo is planning to implement this solution

*“We are profoundly grateful for our collaboration with MnTAP. The insights and initiatives worked on and proposed by Zach during his internship have been invaluable, paving the way for significant operational improvements and sustainability measures. His collaboration with our engineering and plant teams to gather and analyze information was exemplary.”*

*~ Travise Beaton  
Snr. Manager, Maintenance and Engineering  
St. Paul Beverage Solutions*

# Solutions

## Decrease Post-Rinse/Intermediate Rinse Times for CIP Systems

Post-rinses and intermediate rinses are used to eliminate any detergent in tanks and lines from CIP wash steps. Decreasing the run time of post-rinses and/or intermediate rinses when possible is recommended. The run time of the rinses can be reduced for multiple circuits on each CIP system. The recommended run time was determined based on conductivity data. Implementing this solution would save 3,000,000 gallons of water, 4,240 therms of natural gas, and \$32,300 each year. Resulting SAC reductions could save up to \$6,600 each year.

## Decrease Pre-Rinse Times for CIP Systems

Pre-rinses within CIP systems are used to remove the majority of loose sediment before sending a wash through to eliminate the rest of the scale and fouling. There are no turbidity sensors in the CIP systems (turbidity sensors measure the amount of suspended particles within a liquid) so there was no data to create a recommendation with. Reducing the pre-rinse times to the new post-rinse or intermediate rinse times (whichever was longer) was proposed. This would still allow for the water to clear out the loose sediment, as the majority of the sediment can be removed very quickly. Annually, this solution would save 3,900,000 gallons of water, 7,520 therms, and \$45,600 overall with the potential to save up to \$8,900 in SAC reductions.



Recommendation	Annual Reduction	Annual Savings	Status
Automate Bottle Washers and Install Flow Orifices	1,200,000 gal water	\$10,600	Planned
Utilize Existing Ammonia Chiller to Chill Aseptic Liquefier	1,500,000 gal water	\$9,200	Recommended
Decrease Post-Rinse/Intermediate Rinse Times for CIP Systems	3,000,000 gal water 4,240 therms	\$32,300	Recommended
Decrease Pre-Rinse Times for CIP Systems	3,900,000 gal water 7,520 therms	\$45,600	Recommended

**MnTAP Advisor:** Laura Sevcik, Associate Engineer