

# Water Conservation at St. Paul Beverage Solutions

Zach Bahrke

MnTAP Advisor: Laura Sevcik

Company Supervisors: Jamie Paakkonen / Travise Beaton



UNIVERSITY OF MINNESOTA

**Driven to Discover<sup>SM</sup>**

# Company Background

## Facility Background

- Employs 284 people
- 200,000 square feet
- Initially known as Schroeder Milk Company
- Purchased by DFA in 2019 and renamed to St. Paul Beverage Solutions

## Products and Services

- Dairy
- Primarily milk products



# Incentives to Change

## Water Savings

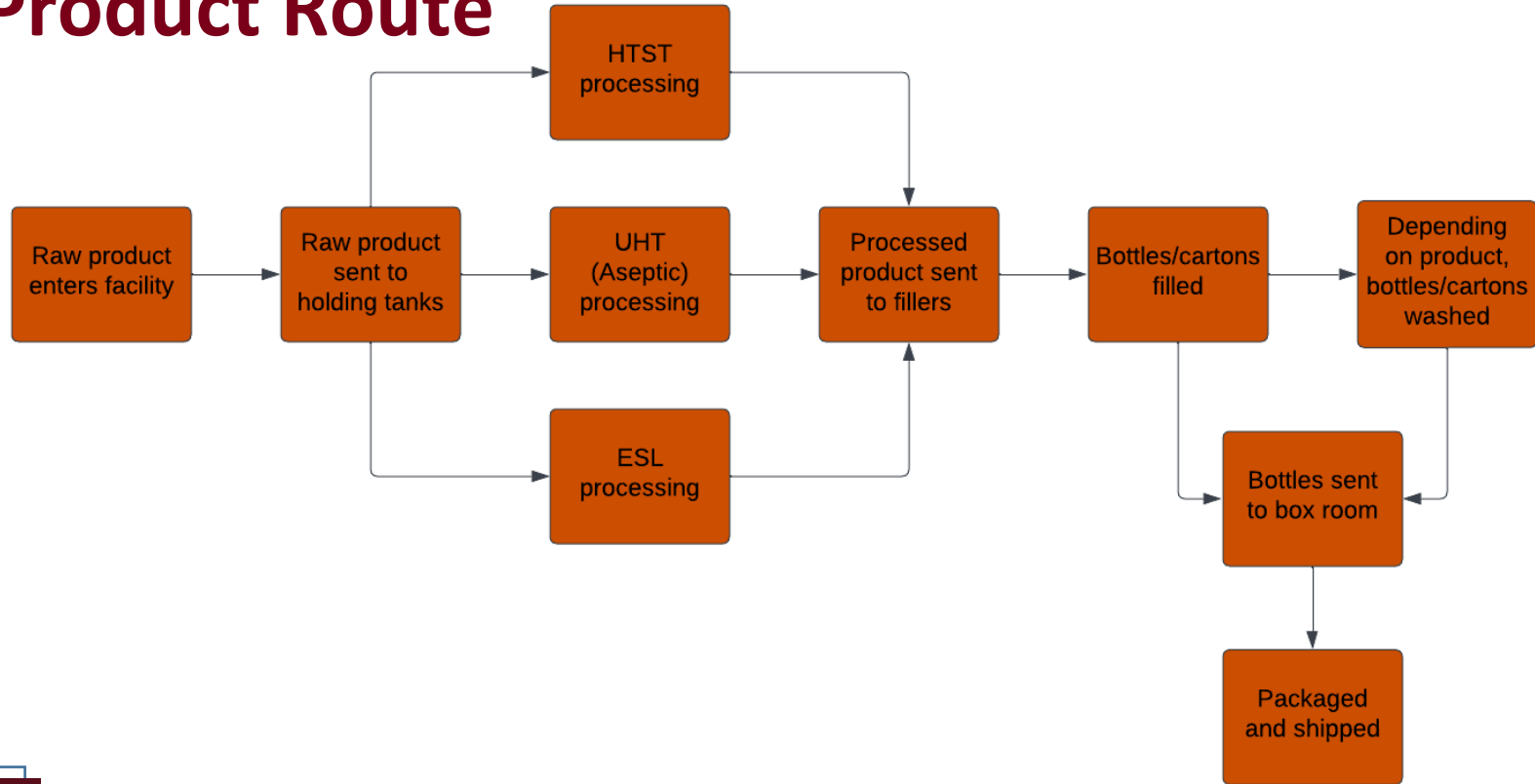
- Lowering annual water use
- Cost savings associated with water use reduction



## Streamlining Processes

- Automation of pre-existing manual processes
- Modification of current procedure

# Product Route



# CIP (Clean-in-Place) Systems

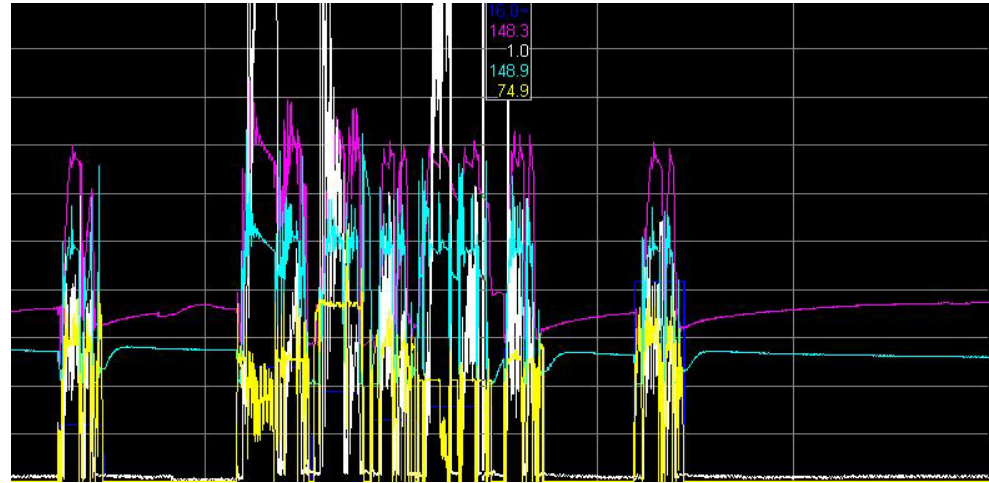
- CIP systems clean tanks/product lines
- May include:
  - Pre-rinse
  - Intermediate-rinse
  - Post-rinse
  - Caustic/acid wash
  - Sanitize
- Remove product, scale and biofouling
- Each system is responsible for multiple tanks/lines called circuits
- Trended system data



**A Reuse CIP system**

# Trending CIP Data

- Trend lines were used to find data points
- Inlet/outlet temperatures, flow rates, and conductivity were used to quantify fuel/water savings



Trended data from FTView

# Decrease Post/Intermediate-Rinse Time

## Water Savings

- Utilized Trended data
- Monitored the conductivity to find when it reached a low point for each circuit
- Added a safety net of 20 seconds to the new rinse time

## Fuel Savings

- Due to lower water usage, fuel was also saved
- Only applied to some circuits

# Decrease Pre-Rinse Time

## Water Savings

- Trended data was utilized
- There was no turbidity sensor present
- Used post/intermediate-rinse time for new pre-rinse time
- Safety net of 20 seconds utilized

## Fuel Savings

- Same as post/intermediate-rinse



**Natural gas boiler**

[10 Ton Natural Gas Fired Steam Boiler \(aac-autoclave.com\)](http://aac-autoclave.com)



# Solutions

Recommendation	Annual reduction	Total cost	Annual savings*	Payback period	Status
Decrease post/intermediate rinse times for CIP systems	3,000,000 gal water 4,240 therms	No cost	\$38,900	Immediate	Recommended
Decrease pre-rinse times for CIP systems	3,900,000 gal water 7,520 therms	No cost	\$55,450	Immediate	Recommended
Bottle washer automation and installation of flow orifices	1,200,000 gal water	\$30,000	\$13,300	2.3 years	Planning
Utilize existing ammonia chiller to chill aseptic liquefier	1,500,000 gal water	\$43,000	\$12,600	3.4 years	Recommended

\*These savings include possible SAC charge deductions

# Personal Benefits

- Capability to lead projects
- There are no “dumb” questions
- Utilizing time in an efficient manner
- Working with those around me to reach valid solutions

