



# TreeHouse Foods



**Nick Tulshibagwale**  
Mechanical Engineering  
University of Minnesota, Twin Cities

## Company Background

TreeHouse Foods is an international producer of privately labeled packaged foods and beverages. The Fridley, MN facility specializes in the production of artisan bread and ready-to-bake frozen cookie dough.



*“Working in a food processing facility has exposed me to fundamental thermodynamic processes in practice. I can now associate abstract theory with things I have seen in person. Tackling the project has also given me confidence in approaching problems without a clear solution. The project was challenging, but TreeHouse Food’s enthusiasm for my work made my time there worthwhile.” ~ NT*

## Project Background

In 2018, 14 million gallons of water were used by the commercial bakery. Only 38% of this incoming water was tracked by submeters for use in different facility processes. The project was undertaken to shed light on the unmetered water use, which makes up 62% of the total incoming water. Moreover, with only 10% of the previous year’s water used in production and the majority of other water intensive equipment being metered, TreeHouse believed that this unmetered water use was worth investigating.

## Incentives To Change

Creating a detailed water balance would reveal water reduction opportunities and provide TreeHouse Foods with a better understanding of their facility’s water use. Additionally, the bakery was interested in monitoring changes in product loss as a way of tracking the effectiveness of future process improvements. By tackling these concerns, TreeHouse Foods hopes to lower their cost of production while improving the facility’s sustainability.



*“The MnTAP program provided us with a cost effective way to evaluate our overall water usage in the plant and the summer intern provided very reasonable and sustainable solutions to our problem.”*  
~ Jeff Severseike  
Environmental Health & Safety Manager  
TreeHouse Foods, Inc.

# Solutions

## Deducting Product Water from Sewage Bill

The facility sewer charge is calculated from the total amount of water that enters the facility. Water that is used in the products should be deducted from the city sewage bill. The city agreed to investigate the facility's sub meters measuring product water and reassess the sewage charges.

## Condensate Return on Line 1

Steam used by the proof box and oven is drained once it condenses. To ensure water temperatures meet effluent standards, cool city water is poured on the condensate as it drains. Two condensate recovery units and piping could be installed to deliver the equipment's condensate into preexisting condensate lines over the oven. Reusing this hot water for steam generation will eliminate utility costs associated with treating and heating new boiler feedwater.

## Maintenance of Softeners and Regeneration Frequency Adjustment

With a new boiler installation, the facility has been focused on ensuring the softeners function properly. The plant should have softeners regularly maintained to ensure regeneration occurs properly, and the outgoing water is softened. The softeners should be slowly adjusted to regenerate less frequently. By doing so, the plant will greatly reduce water and salt usage.

## Aerators on Sinks

There are 23 faucets within the facility whose flowrates could be reduced to save on hot water usage. Aerators were installed on all hand and utensil sink faucets.

## Board Washer Maintenance

The conveyor washer should be inspected every few months. The mechanical floats currently used are damaged easily and should be replaced with more durable level sensors. Missing jet nozzles, endcaps, or rubber washers means water is used at a high rate. Placing a priority on the maintenance will greatly reduce hot water usage.

## Ball Valve on Line 2's Freezer CIP System

A valve on the hot water line running to the line 2 freezer CIP system must be opened prior to the start of the cleaning cycle. If the valve is not shut off following the end of the CIP cycle, water will continue to be sprayed above the spiral freezer stacks. The sanitation crew was made aware of the importance of shutting off the ball valve.

## Strategic Meter Placements

Sanitation activities account for approximately 25% of the unmetered water use. Strategic water meter placements would provide a more detailed account of water usage, which would help TreeHouse find additional water conservation opportunities.

Recommendation	Annual Reduction	Annual Savings	Status
Deducting Product Water from Sewage Bill	N/A	\$8,000	Recommended
Condensate Return on Line 1	450,000 gallons water 3,000 therms 4,300 lbs salt	\$3,700	Recommended
Maintenance of Softeners and Regeneration Frequency Adjustment	363,000 gallons water 35,000 lbs salt	\$3,900	Implemented
Aerators on Sinks	43,000 gallons water 100 therms	\$200	Implemented
Board Washer Maintenance	270,000 gallons water 5,000 therms	\$3,600	Recommended
Ball Valve on Line 2's Freezer CIP System	50,000 gal water 300 therms	\$40	Recommended
Strategic Meter Placements	N/A	N/A	Recommended

MnTAP Advisor: Matt Domski, Waste Prevention Specialist