



# Grede Foundry



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## Organization Background

Grede Foundries, Inc. was founded in 1920 when William J. Grede purchased Liberty Foundry in Wauwatosa. The company specializes in ferrous metal including gray iron, ductile iron, and steel castings. The company operates nine foundries and one machining facility across the US. Grede - Saint Cloud has over 360 employees and produces roughly 80,000 tons of product each year.



*"Through my time at Grede - Saint Cloud, I was given all the help and support [needed] from MnTAP staff and my onsite supervisor Don Scheele, to complete my tasks and achieve my goals. I have learnt that I could make a difference and I did. This internship has given me a better understanding of the industry, a foundation and confidence for my future career." ~ HV*

## Project Background

Grede - Saint Cloud consumes approximately 39 million gallons of water and discharges around 31 million gallons of water each year.

The company had partially mapped out water usage and distribution previously in the plant. Single pass cooling and cooling towers were known to be two major causes of water consumption. Hence, these were the focuses of the project.

## Incentives To Change

Grede has always seen sustainability as one of the pillars of its long-term growth. Grede is committed to environmental sustainability and limiting the environmental impact of their activities, products, and services.

Consequently, the company engages in water conservation efforts to reduce impact and costs.

## SOLUTIONS

### Install Air-Cooling Units on Core Machine and Impactor

Single-pass cooling is currently utilized for a core machine and the impactor. By installing air-cooling units, approximately 2,900,000 gallons of water and \$23,000 can be saved each year.

### Turn Off Core Machine on Non-Production Days

The cooling fan for the core machine has been purchased but cannot be installed until December. Meanwhile, another temporary recommendation was made to ensure the core machine is properly shut down during non-production days. This is projected to conserve 250,000 gallons of water and save \$4,000.

### Reuse Water from South Sand Chiller in Sand Room

The south sand chiller is near the sand room. The discharge water from this unit still has sufficient cooling capacity for reuse. Thus, it is recommended the discharge water be rerouted to the sand room to replace the incoming city water. This recommendation is estimated to

# Solutions

conserve 1,900,000 gallons of water and save around \$15,000 per year.

## Connect Cooling Tower to BMD Hydraulic Cooling System

The BMD hydraulics cooling system has the highest water consumption in the plant. Since there is an unused cooling tower that is still operable, it is possible to connect the two units. This will eliminate the use of around 5,800,000 gallons of water and save roughly \$46,000 annually.

## Install Additional Air-Cooled Heat Exchangers for Cooling

A properly designed air-cooled heat exchanger will use no water. Replacing current systems with air-cooled heat exchangers can reduce water consumption by 14,400,000 gallons each year. Additionally, chemical treatment use will be reduced by 4,300 lbs. In total, this will save around \$121,000.

## Install Deduct Meters on Cooling Towers and Bentonite Recovery System

Since water is not discharged directly into the sewer in bentonite recovery and evaporates in the cooling towers, the water that is not discharged can be deducted from the sewer bills. If deduct meters are installed, approximately \$6,000 will be saved every year. An additional \$32,000 will be saved if deduct meters are installed but the cooling towers are not replaced with air-cooled heat exchangers.



*"I was pleased to host a student intern this summer... The student was eager to learn and get involved with our operations and identified several projects focusing on cooling water usage. This is a great program to get students involved in industry and make a positive difference."*

*~ Don Scheele, Environmental Project Engineer  
Grede - St. Cloud*

Recommendation	Annual Reduction	Annual Savings	Status
Install Air-Cooling Units for Core Machine and Impactor	2,900,000 gal	\$23,000	Implementing
Turn Off Core Machine on Non-Production Days	250,000 gal	\$4,000	Implementing
Reuse Water from South Sand Chiller in Sand Room	1,900,000 gal	\$15,000	Recommended
Connect Cooling Tower to BMD Hydraulic Cooling System	5,800,000 gal	\$46,000	Recommended
Install Additional Air-Cooled Heat Exchangers for Cooling	14,400,000 gal 4,300 lbs chemicals	\$121,000	Recommended
Install Deduct Meters on Cooling Towers and Bentonite Recovery System	N/A	\$6,000	Recommended

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