



Kerry



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Company Background

Kerry is a global food company headquartered in Naas, Ireland with a North American headquarters in Beloit, Wisconsin. The Rochester, MN facility specializes in applied health and nutrition. What makes the Rochester facility unique is its process of creating products through fermentation followed by conversion to solid form using evaporators and spray dryers. They produce spray-dried fermented ingredients that are used as natural shelf-life extenders in breads and as natural meat cultures. They also produce liquid buffered vinegars and peptides. Kerry takes pride in the ability to deliver high-quality fermented products in dry form to its customers.



"My experiences at Kerry have been very beneficial in discovering what it's like to be an engineer. I've been able to work on a diverse set of projects that complimented my existing computer science background and challenged my engineering skills. It's exciting to see the value Kerry put on my recommendations as they begin implementation." - NS

Project Background

The Rochester, MN, plant of Kerry is undergoing a major expansion project. The increase in production capacity will demand more electricity, natural gas, air, and raw materials for plant operations. Additional water will be needed to accommodate the expansion. Kerry would like to review opportunities to optimize their water usage without increasing water capacity due to sewer and permit limitations as well as corporate sustainability goals.

Incentives To Change

Kerry must be conscious of wastewater discharge to the Rochester Water Reclamation Plant. Sewage pretreatment requirements are set by City of Rochester, Minnesota City Ordinances to avoid wastewater loading that unbalances the city's wastewater treatment process. The wastewater must have a pH between 5 and 11. If it is out of range or has other corrosive properties, the water can harm the desired microbes used in wastewater treatment, cause damage to equipment, or be hazardous to personnel of the wastewater plant.

Kerry is also charged for biochemical oxygen demand (BOD) discharges and seeks opportunities to divert BOD from waste streams as well as regain product by reducing

BOD pollution at its source. There are opportunities for Kerry Rochester to reduce BOD loading and optimize pH management that will allow Kerry to achieve permit compliance. This includes source reduction of waste and pollution prevention.

The Kerry 'Towards 2020' program sets goals and targets to reduce environmental impacts of its operations. Kerry is committed to reducing water use by 7% by 2020 compared to baseline year 2018. Focusing on energy efficiency, water conservation, and chemical optimization opportunities will advance the Kerry 'Towards 2020' targets. Beyond 2020, Kerry also has a goal of reducing water usage to the 2017 baseline by the year 2025. Kerry also can save money by reducing energy consumption and wastewater loading.

"MnTAP is a valued partner for Kerry, and has provided key capabilities in wastewater management that will enable the company to continue growing more sustainably."

*~ Brian Morgan
Mechanical Engineer Project Manager, Kerry*

Solutions

Water Conservation Through Water Reuse

City water is used for boiler make-up, process, clean-in-place (CIP) processes, plant cleaning, and glycol chiller make-up. Approximately 7.5 million gallons per month of city water is used. The main water conservation opportunity explored in this project is the opportunity to take condensate water, filter it, and reuse it for other processes such as cooling tower make-up and first-rinse CIP water.



BOD and Waste Reduction

Kerry Rochester specializes in fermented and cultured ingredients. The ability to deliver products such as cultured celery product for meat curing as a dry ingredient is important for customers. Two evaporators are used to concentrate product. Kerry then utilizes spray dryers to convert products from a liquid form to a dry form. The dry ingredient is packaged onsite and is prepared for shipping. Opportunities to reduce BOD and product being washed down the drain were also explored as part of this project.

Effluent pH Control

Kerry is implementing a new wastewater effluent pretreatment system that consists of two 30,000 gallon equalization tanks and two 7,500-gallon adjustment tanks. Water is held in the tanks to allow for mixing and pH correction before flowing to city sewer. A portion of this project focused on designing and programming this pH control system to increase residence time and neutralize water discharges to meet compliance for pH.

| Recommendation | Annual Reduction | Annual Savings | Status |
|---|---|-----------------------------------|----------------|
| Update pH Process Control Logic on Effluent System | 4,000,000 gallons of water with unsafe pH | \$20,000 | Implemented |
| Reuse Evaporator Condensate Water | 30,000,000 gallons of water | \$300,000 | Planned |
| Reduce BOD and Product Loss by Prioritizing Efficient Spray Dryer | 190,000 lb BOD | \$233,000 product and BOD savings | Planned |
| Reduce BOD and Product Loss Through Spray Dryer Upgrade | 511,000 lb BOD | \$624,000 product and BOD savings | Future Project |

MnTAP Advisor: Jon Vanyo, Engineer