



Seacole Specialty Chemicals



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Organization Background

Seacole, a chemical manufacturing company in Plymouth, Minnesota, specializes in producing chemicals for diverse sectors. Led by CEO Gregg Elliott, Seacole aims to enhance water efficiency to improve product quality and innovation.



“Embracing the MnTAP internship, I’ve learned that impactful changes start with small steps. Witnessing how innovation and sustainability align to create a brighter future has been truly inspiring. The projects with Seacole have not only enhanced my skills but also instilled a deep appreciation for responsible resource management.” ~ JRJ

Project Background

The project aims to optimize water use at Seacole’s chemical facility, reducing costs and environmental impact. Similar successful projects in the industry indicate a high probability of success. This project aligns with Seacole’s values and serves to maximize resource efficiency.

Incentives To Change

Seacole seeks to enhance water management due to rising consumption. Improved water efficiency aligns with Seacole’s values and serves to improve environmental resilience against resource challenges.

“We were very pleased to have Jayaditya Reddy Jillella at Seacole Specialty Chemicals this summer. We wanted to focus on the quantity of water used, distribution within the plant and ideas for water reduction and reuse. Jay not only completed these objectives but also suggested improvements for water saving projects that we are in the process of reviewing and implementing”

*- Sara Ethier, Regulatory Manager
Seacole*



Solutions

New Hand Spray Nozzle (6 gpm) for Manual Cleaning Processes

The implementation of a new hand spray nozzle with a 6 gpm flow rate, comparable to the existing 10 gpm flow rate cleaning nozzles, across manual cleaning processes for dry mixers (DM) and liquid mixers (LM) promises substantial benefits. This transition would result in a total water consumption reduction of approximately 75,100 gallons per year which cuts down the cleaning water usage by 40%. A survey was conducted to test the new nozzle in action and most of the operators have had a positive response to its installation.

Siphon Gun for Dry Mixers

Exploring the integration of a new hand spray nozzle with a 16 gph (0.26 gpm) siphon flow rate exclusively for the final cleaning stage of DM mixers presents opportunities for enhanced water efficiency. Siphon guns function by using minimal water volume through the utilization of air vacuums. However, the adoption of this approach necessitates addressing potential new challenges, including dust generation, dust collector accommodation, operator safety measures, and the provision of suitable personal protective equipment (PPE). Thorough investigation into these concerns is crucial before proceeding. When all the challenges are addressed, this equipment can save approximately 31,100 gallons for dry mixer cleaning, with additional savings potential if utilized for other cleaning processes.

Reverse Osmosis (RO) Reject Water Recovery

The company generates an annual volume of 157,500 gallons of RO reject water, constituting a substantial 23% of its total water usage. As of now, this reject water is channeled directly into the sewer system, resulting in elevated sewer charges. This water can be stored and used to adjust the pH of the wastewater tanks instead of using soft water. This could allow us to find a purpose for the untapped RO rejected water and also avoid the use of conventional soft water for this process. This recommendation assumes we can successfully capture 100,000 gallons of this reject water.



Recommendation	Annual Reduction	Annual Savings	Status
Use 6 gpm Industrial Spray Nozzles	75,100 gal	\$680	Implementing
Implement Siphon Guns for DM Mixer Cleaning	31,100 gal	\$220	Recommended
Reuse RO Reject	100,000 gal	\$900	Recommended

MnTAP Advisor: Jon Vanyo, Senior Engineer