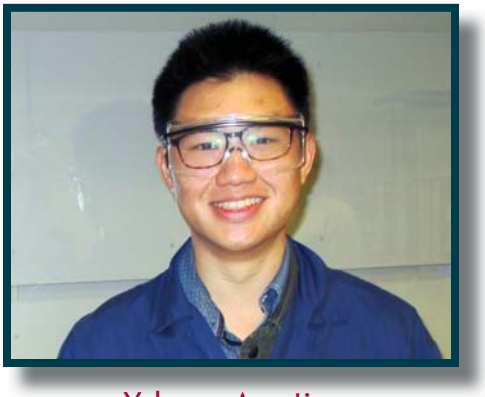
DiaSorin Incorporated



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Company Background

DiaSorin, Inc, is an Italian biomedical company developing, producing and commercializing diagnostic tests for a wide range of clinical areas in the markets of immunodiagnostics and molecular diagnostics. The Stillwater, MN facility, produces and distributes the kits around the world.

"I've always been passionate about pushing for a greener chemical industry, and this program has allowed me to use my engineering skills to realize large water savings that make both economic and environmental sense. This internship has exposed me to thinking creatively for opportunities to reduce wastage, and how to navigate office dynamics, and push recommendations towards successful implementation. These skills will better equip me to enter the workforce as a full-fledged engineer." ~ YA

Project Background

Based on water utility bills for the 2015-16 year, DiaSorin consumes approximately 8.5 million gallons per year of water both for its manufacturing and domestic needs. This water is purchased from the City of Stillwater. At the beginning of this project, 37% of incoming water was unaccounted for and a major goal was to account for the unidentified water use. In quantifying more of the water use footprint, water reduction strategies emerged that would reduce water use, sanitary sewer costs and potential sewer availability charge (SAC) increases.

The project was divided into 2 stages; first, major water-consuming areas in the facility were identified, and second, possible water reduction strategies were proposed.

Incentives To Change

A better understanding of water use was desired in order to pursue the most prudent opportunities for water reduction. Overall water supply and sewer costs were significant and the potential for assessment of additional SAC units prompted DiaSorin Inc. to look closely at water conservation with a MnTAP intern.

"This is the first time that DiaSorin teamed up with MnTAP to sponsor an intern, and it was a huge success! The intern was professional, well prepared and organized. He stayed focused on mapping resource usage, collecting and analyzing data, and identifying ways to reduce resource consumption. MnTAP's internship program is a great benefit for interns and Minnesota businesses alike."

~ Kelly Gilliland, EHS Manager, DiaSorin

Solutions

Repairing Leaks and OptimizingVacuum System

DiaSorin utilizes a liquid ring vacuum pump to provide 24 inches mercury (Hg) of vacuum for the entire facility. Vacuum is used for benchtop and fume hood filtration, as well as for pouching (vacuum packing of diagnostic kits). A new water supply meter identified 24/7 water leaks that prompted installing a new flow meter and new solenoid valve on the vacuum pump system.

Installing Ultra-low Flush Toilets

Installing ultra-low flush toilet bowls reduces domestic water consumption due to flushing of toilets by up to 20%. Toilet flushing is approximately 50% of domestic water consumption based on research and assumptions made at DiaSorin.

InRecycling Reverse Osmosis (RO) Water for Hot Water Make-up

RO concentrate can be recycled into the hot water line in Buildings 3 and 4 at DiaSorin. The RO concentrate, having been previously softened in ion-exchange columns, have effectively zero hardness, meaning low probability of lime-scale formation on glassware and buffer tanks. A pilot experiment should be conducted to ascertain any differences in cleanliness of glass ware and tanks between a city water and RO concentrate wash.

Optimize the Irrigation System

Current clock-based controllers at DiaSorin can be replaced by more effective smart technology controllers to save a potential 50 percent in irrigation water use.

Proper Control of Hot Water Hardness Levels

Hot water is conditioned by ion-exchange to maintain a low hardness range. It was determined that cold water was tied to hot water loops causing a need to routinely purge the water supply loop to maintain water quality. Installing check valves on eight system sinks and implementing a hot water hardness monitoring plan is recommended.

An additional energy conservation aspect was also explored Some fume hoods in the facility run continuously, meaning conditioned air (cold in summer, hot in winter) is continuously lost from the facility. Proper control of these exhaust points by installing timers can save energy by reducing exhaust fans working time, reduce loss of heat during summer, and reduce cooling tower load in summer (potentially saving water as well). Less air would also need to be re-conditioned to maintain positive pressure in the building.

Recommendation	Annual Reduction	Annual Savings	Status
Solenoid valve leak elimination	977,600 gallons	$6,800	Implemented
Throttling flow through vacuum pump	2,200,000 gallons	$15,400	Implemented
On-demand vacuum system	522,300 gallons 28,000 kWh	$5,200	Implementing
Recycle RO concentrate for hot water make-up	26,000 gallons	$180	Further analysis needed
Upgrade to ultra-low flush toilet bowls	747,500 gallons	$5,200	Recommended
Install smart irrigation controllers	403,800 gallons	$570	Recommended
Replace check valves and faucets in hot water line	15,600 gallons	$1,400	Recommended

MnTAP Advisor: Michael Jost, Senior Engineer