



MT2P Summer Internship Case Study: Sacred Waters Brewing Company

Company Intro

Located in Kalispell, MT, Sacred Waters Brewing Company has provided a warm atmosphere to enjoy food, music, and delicious craft beers since 2018. According to the Brewers Association, Sacred Waters is considered a Micro-Brewpub, brewing less than 15,000 barrels and selling most of it onsite along with food. While the award-winning brewery boasts 12 different varieties of beer, their most famous three (Catch 'em Lager, Hungry Horse Hazy IPA, and The Bob India Pale Ale) are also canned and distributed throughout the state. The company Jordan Gentry founded to celebrate her mother's life and love for the outdoors has since been awarded a bronze medal in the 2024 World Beer Cup and is always striving for improvement.



Challenges and Opportunities

The Montana Pollution Prevention Program (MT2P) is a collaboration between Montana State University, the Montana Manufacturing Extension Center, and the EPA that provides Montana businesses the opportunity to be part of the solution. It is dedicated to improving efficiency in these businesses while conserving air, water, and natural resources in this beautiful state. The team at Sacred Waters identified wastewater and hops as their biggest contributors to waste. The water table of the drainage field only permits 150 gals to be discharged each day. Additionally, the septic system prohibits them from dumping hop blow-off, a nutrient-rich material, down the drain. Excess water usage was observed in the canning process and the holding tanks for the hop blow-off offer an opportunity for change.

Solutions

Water Flow Meters

The machine used for canning has three sets of nozzles that spray water to rinse the cans and conveyor belts to prevent debris and buildup. A new water pump had recently been installed which increased the pressure on these nozzles. After measuring the flow rate on the first day of canning, it was clear that this pressure increase caused a flow rate that would surpass the 150-gallon discharge limit. Adjusting the valves on the nozzles brought the flow rate down to a permissible amount while still allowing the machine to operate properly. The P2 recommendation is to install inline flow meters to each of these nozzles and monitor them throughout canning to allow for the minimum flow rate necessary.

Figure 1: Water usage in the rinse stage of the canning process



Dirt Rich Composting

During the brew process, the fermentation tanks are purged into buckets to remove the hop sediment. In the brewing world, this is known as hop blow-off. These buckets and chemicals to inhibit undesired bacterial growth are dumped into an underground holding tank. Once every 4-6 weeks a sanitation company empties this tank and the solid organic waste is brought to a landfill. Instead of discouraging organic growth and filling landfills, composting of this material is recommended. A sample of hop blow-off and empty grain sacks were brought to Dirt Rich, a local compost collection company, to gauge their interest. A partnership was formed as hop blow-off is an efficient composting material and the empty sacks can be filled with compost ready to be sold to local farmers. This recommendation eliminates the waste streams of hops and grain sacks while also supporting another local business.



Figure 2: Hop blow-off collection

Results

Recommended P2 Actions	If Implemented:					If Not Implemented:	
	\$		Annual Reductions				
	One-time Cost to Implement (\$)	Annual Savings from P2 Action (\$)	Water use (gal.)	Solid Organic Waste Pollution (lbs)	Solid Waste Pollution (lbs)	Barrier to Implement	Plans to Implement within 5 years? (pick Y/N)
Inline Water Flow Meter	77.28	-	3944	-	-	-	Y
Composting Hop Blow-off	12	3680	-	16,380	-	Cost / Extra work for team	Y
Reusing Grain bags for compost	-	-	-	-	1111	Dirt Rich Demand	Y

Additional Recommendations

Some of these P2 recommendations could carry over into the restaurant side of Sacred Waters. The brewery side is already recycling flawed cans from the canning process and it is suggested that the restaurant installs recycling bins for the non-alcoholic beverages consumed. Additionally, if Dirt Rich is already collecting the hops from the brewery, the restaurant could collect food scraps and add to the compost bins. Motion sensor lights are used in the bathrooms of the restaurant but could also be an efficient energy saving tool in the walk-in freezer, mill room, and grain room. Lastly, a grain silo that feeds into the mill would eliminate waste from grain sacks and improve the ergonomics of the work environment.



About the Intern

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