Paradox Brewing Reduces Environmental Footprint

NYSP2I | New York State Pollution Prevention Institute

Paradox Brewing

Paradox Brewery (Paradox) is a small craft brewery located in North Hudson, NY. The brewery produced approximately 3,800 barrels of beer between 2019 and 2020. Paradox is relatively unique among craft brewers in the fact that they are not connected to a sewer and must use a leech field for discharge. Paradox primarily sells beer via an onsite taproom.

Challenge

Paradox wanted to understand and decrease the environmental impact of the brewery as part of its commitment to environmental stewardship. As a growing brewery, Paradox has exemplified a commitment to sustainability and has already incorporated severalseveral methodologies and techniques to be more sustainable. However, Paradox wanted a fresh perspective to learn even more opportunities to further its sustainable practices. As part of the Brewery Sustainability Initiative being pursued by the New York State Pollution Prevention Institute (NYSP2I), Paradox completed an initial brewery survey and was selected to receive an onsite opportunity assessment.

Solutions

NYSP2I collaborated with Cornell University to help evaluate and identify any opportunities to reduce Paradox's environmental footprint. NYSP2I conducted a virtual site visit to collect baseline metrics and identify pathways for improving Paradox's existing sustainability practices.

Challenge

- Paradox wanted to identify methods to further decrease the environmental footprint of the brewery.

Solution

- NYSP2I collaborated with Cornell University to conduct a virtual site visit and collected baseline metrics to help evaluate and identify any opportunities to reduce Paradox's environmental impact.

Results

- Paradox implemented sustainability practices to reduce waste generation and energy consumption including managing chemical and biological oxygen demand, centrifuging solids out of post-brewing and post-fermentation liquids and solids, and using uninsulated pipes to provide ambient heating for the brewery.
- NYSP2I and Cornell University identified ways to further decrease water, chemistry, and natural gas consumption which include utilizing EDTA instead of nitro-phosphoric acid

Results

At the time of the virtual opportunity assessment performed by NYSP2I and Cornell University, Paradox had already implemented a number of practices to reduce the brewery's environmental footprint. These include:

- Use of membrane bioreactors to decrease the loading of chemical and biological oxygen demand (COD & BOD) on the environment.
- Centrifugation of brewing and fermentation wastes to recover as much potential product as possible.
- Keeping pipes uninsulated to remove the need for ambient heating.

The work performed by NYSP2I and Cornell University led to key findings to support Paradox in their pursuit of decreased environmental impact. Some considerations for Paradox to review include:

- Consider swapping from nitro-phosphoric acid to ethylenediaminetetraacetic acid (EDTA) to reduce impact of cleaning systems on the environment
- Install a centrifuge or basket filter to remove solids at the membrane system and reduce frequency of solids pump-out for disposal
- Install low flow nozzles and sinks to reduce water use
- Consider partnering with organizations that can take solid waste for value-added repurposing, such as animal feed and waste-to-energy (anaerobic digestion)

Implementation

- Since the assessment report, Paradox has brought their Clean-In-Place (CIP) skid online which has enabled the reuse of 15,600 gallons water annually (300 gallons of water per week). This change has resulted in the reduction of caustic and acid use, in the amount of 150 gallons/year at a cost savings of $2,000 per year.
- Paradox has also installed water meters to track water use to be able to monitor water use as part of a continuous improvement program to reduce their environmental footprint.

Results (continued)

for cleaning cycles to reduce phosphorus loading to the environment, installing solids removal technology to reduce membrane concentrate disposal, and partnering with outside organizations to further valorize solid waste.

Paradox Brewing

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Although the information in this document has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement X9-96264400 to the New York State Pollution Prevention Institute at Rochester Institute of Technology, it has not gone through the Agency's publications review process and, therefore, may not necessarily reflect the views of the Agency and no official endorsement should be inferred. Funding provided by the State of New York.

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