



RHODE ISLAND

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, Rhode Island 02908

Environmental Fact Sheet

IPP Fact Sheet – Breweries, Distilleries and Wineries

INTRODUCTION:

While recent growth in the craft beer, spirits and wine industry has provided economic benefits for local communities, this increased activity has the potential to negatively impact the community's Publicly Owned Treatment Works (POTW). POTWs are typically designed to primarily treat domestic wastewater, not industrial wastewater. Domestic wastewater consists of used water from houses and apartments and has known typical biological and hydraulic characteristics. Industrial wastewater has different biological and hydraulic characteristics depending on the type of manufacturing or chemical processes being performed.

Every POTW is carefully designed to receive and treat incoming wastewater, based on the well-established characteristics of domestic wastewater and perhaps characteristics that are specific to industries located within a municipality. The wastewater generated from breweries, distilleries and wineries has its own unique characteristics, such as high-strength Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS), as well as hydraulic characteristics such as slug loads. These characteristics and their impacts are further described below.

NEGATIVE IMPACTS OF BREWERY AND DISTILLERY WASTE ON POTWS:

Upsets to the normal biological treatment processes at a POTW can result in effluent discharge limit violations of the POTW's Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit as well as possible fines for such discharge permit violations. It can also include loss of a disproportionate amount of biological treatment capacity, resulting in an increase in process upsets and operational costs. Operational costs include labor, chemical usage, energy usage, and sludge production and disposal. Specific negative impacts include:

- Increase in Biochemical Oxygen Demand (BOD). BOD is the amount of dissolved oxygen needed or demanded by aerobic biological organisms to break down organic materials in wastewater. Average municipal BOD values range from 100 to 400 mg/L, while high strength BOD values from breweries, distilleries or wineries can range from 5,000 to over 20,000 mg/L. These high-strength BOD discharges originate from bad batches of product, first rinses of process tanks, or wasted product from fill stations and bottling lines when the waste product is washed down the drain. High-strength BOD discharges require additional treatment for the POTW to meet its RIPDES effluent discharge permit limits.
- Increase in Total Suspended Solids (TSS). TSS are solids in water that can be trapped by a filter.

Average municipal values range from 100 to 400 mg/L, while high-strength TSS values from breweries, distilleries or wineries can range from 3,000 to over 15,000 mg/L. These high-strength TSS discharges come from spent grains, mash, hops, trub, grape skins and waste juice.

- High flows/hydraulic loading to the POTW due to process and cleaning operations from the brewery/distillery/winery. High flows can range from 5 to 15+ gallons for each gallon of product made.
- Potential for high phosphorus loadings due to cleaning processes at the brewery, distillery, or winery.
- Wide ranging pH values from cleaning and disinfection processes at the brewery, distillery, or winery. The pH can range from 2-12 as a result of these processes; the average range of municipal wastewater is 6.5-7.5. These widely ranging pH values can have a negative impact on both the collection system and the POTW.
- High temperature discharges can have negative impacts on the POTW as well as to the receiving water body, where ambient temperature ranges must be maintained to support native plants and animals.
- Increase in high-strength wastewater being discharged to municipal systems from slug loads, or episodic abnormal discharges, from the brewing and distilling processes. These municipal systems are not designed for such loads and can experience operational issues as a result.

PREVENTING NEGATIVE IMPACTS/PERMITTING:

40 CFR Part 403.3(v)(1)(ii) defines a Significant Industrial User (SIU) as any industrial user that has the potential for adversely affecting a POTW's operation or for violating pretreatment standards or requirements. Due to the potential for these types of facilities to violate pretreatment standards (i.e., exceed, BOD, TSS, or pH limits) and/or adversely affect POTW's operations, RIDEM recommends that breweries, distilleries, or wineries be categorized as SIUs and issued Industrial Wastewater Discharge Permits to control their wastewater discharges. If not categorized as a SIU, at a minimum, these facilities should be required to register as a non-SIU.

Prior to authorizing a brewery, winery, or distillery to connect to the wastewater collection system, a POTW should:

- Determine how much of the Maximum Allowable Industrial Loading (MAIL) capacity for BOD, TSS, etc. the POTW has available (i.e., has not been allocated).
- If the POTW has not established technically-based local limits for BOD and TSS, then determine how much of the hydraulic and load capacity the POTW has available. Consider amending the local Sewer Use Ordinance (SUO) to address permitting authority requirements, establish local limits and address additional costs of treating high strength wastewater via IPP local limits and surcharge levels. Consider whether un-equal allocation of the BOD/TSS MAIL is more equitable.
- Conduct a site visit of the facility and investigate for items that could cause an impact on the collection system and the POTW if discharged (e.g. general housekeeping, solids handling, storage and disposal).
- Require the discharger to file an Industrial Wastewater Discharge Permit Application with the POTW's IPP.
- Require the discharger to implement pollution prevention measures to prevent the high-strength solid and liquid wastes from entering the wastewater discharge.
- Establish a monitoring point for representative sampling of discharge wastewater strength and flow metering. The sampling point should be after the production processes but before additional waste streams from restrooms or food service.
- Sample the process stream when the facility is in full production to determine their contribution

to the POTW.

- If needed, require pretreatment of the wastewater stream including but not limited to:
 - Reduction of BOD and TSS to acceptable levels (concentrations or mass) before discharge through compliance with the Industrial Wastewater Discharge Permit and local SUO, and implementation of Best Management Practices (BMPs)/pollution prevention measures.
 - Reduction of amount of wastewater generated through BMPs/pollution prevention measures. An efficiently managed process produces 2 to 4 gallons of wastewater for every 1 gallon of product. In contrast, a poorly managed process may produce over 15 gallons of wastewater, per gallon of product. RIDEM has a separate *Wastewater Disposal Guidance for Breweries, Wineries & Distilleries Fact Sheet* that discusses the types of BMPs that can be used by these facilities to reduce wastewater impacts.
 - pH neutralization and flow stabilization before discharge to collection system and POTW.
 - Minimization or elimination of phosphorus-based product cleaners.
 - Elimination of high-temperature discharges.
 - If needed, and the authority is granted in the SUO, implement both an upper local limit and surcharge level for high-strength waste or other impacts to POTW. If needed, and the authority is not granted in the SUO, amend SUO to include both an upper local limit and the ability to implement a surcharge for high-strength waste or other impacts to POTW. Mass-based local limits may be appropriate.

The Brewer's Association has published a Water and Wastewater Sustainability Manual that is a consolidated resource for effective water and wastewater management solutions. This manual may be found online at the following link:

https://s3-us-west-2.amazonaws.com/brewersassoc/wp-content/uploads/2017/05/Sustainability_Water_Wastewater.pdf

SAMPLING GUIDANCE:

To ensure their wastewater meets requirements, breweries must have an accessible monitoring point. They must be able to collect samples that represent the discharge from the brewing operation in a location that is separate from sanitary and/or restaurant drains.

There are two basic types of samples: grab samples and composite samples. The type of sampling that will be undertaken at the industrial user's facility must be understood clearly and should be outlined in the breweries permit. It is very important that the POTW establish specific procedures for collecting grab and/or composite samples. According to 40 CFR 403.12(g)(3), grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfides, and volatile organic compounds. In addition, Grab sampling can also be used when the effluent is not discharged on a continuous basis (i.e., batch discharges of an hour or less), and only when the batch is continuously stirred or well-mixed and the pollutant can be safely assumed to be uniformly dispersed. For all other pollutants, 24-hour composite samples must be obtained through flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the POTW. Time-proportional composite sampling should only be used in instances where the flow and concentration of the wastewater is relatively constant. In either case, composite or grab samples must be representative of the discharge and the decision to allow the alternative sampling must be documented in the file for that facility or in any permit/control mechanism. The correct sample type for each regulated parameter must be included in the industrial user's permit or control mechanism and for compliance determination purposes the inspector must collect the specified type of sample. Any problems noted with the type of sample specified in the industrial user's permit or the control mechanism should be documented. If necessary, the permit or other control mechanism may

need to be revised or amended.

ADDITIONAL INFORMATION:

For more information about issuing industrial wastewater discharge permits, contact the local POTW Industrial Pretreatment Coordinator or the DEM Pretreatment Coordinator. These contacts can be found on the RIDEM RIPDES webpage:

<https://dem.ri.gov/environmental-protection-bureau/water-resources/permitting/ripdes>.

For information on how to reduce the impact on a POTW using pollution prevention measures, contact RIDEM's Office of Customer and Technical Assistance at (401) 222-6822.