



## RHODE ISLAND

### DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, Rhode Island 02908

# Environmental Fact Sheet

## **Solid Waste Guidance for Breweries, Wineries & Distilleries**

### INTRODUCTION:

The U.S. Bureau of Labor Statistics defines breweries as “establishments engaged primarily in brewing beer, ale, lager, malt liquors, and nonalcoholic beer...employing nearly 59,000 people across the United States in 2016.” While the terms microbreweries and craft breweries are used interchangeably, the term brewpub is used to describe a brewery “whose beer is brewed primarily on the same site from which it is sold to the public, such as a pub or restaurant (Source: <https://en.wikipedia.org/wiki/Brewery>).”

The Rhode Island Department of Environmental Management (RIDEM) regulates wastewater discharge, treatment and solid waste management/disposal practices throughout the State. At the municipal level, cities and towns typically have primary permitting and oversight responsibility for breweries within their jurisdictions, subject to RIDEM and federal standards.

### SOLID WASTE:

*Overview:* According to a U.S. Environmental Protection Agency (USEPA) 2012 report “spent brewer’s grain and brewer’s yeast are the two primary solid wastes (by-products) of the beer brewing process. Other by-products include spent brewer’s hops and trub (proteins) which are formed at different stages of brewing, and diatomaceous earth slurry which results from the filtration of beer. Although the majority of these by-products may be repurposed, a portion of them are ultimately disposed (Source: [https://www.epa.gov/sites/production/files/2016-01/documents/msw\\_task9\\_industrialfoodprocessingwasteanalyses\\_508\\_fnl\\_2.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/msw_task9_industrialfoodprocessingwasteanalyses_508_fnl_2.pdf)).” Listed below are several “sustainable best practices” for reuse, recycling or managing your solid wastes (Source: <https://epa.ohio.gov/Portals/29/documents/breweries.pdf>):

#### *Spent grains:*

- animal feed
- bakery ingredients
- compost
- biogas generation

#### *Diatomaceous Earth:*

- reduce use when possible
- replacement with cross-flow filtration technology
- compost
- additive to construction materials

#### *Spent Yeast and Trub:*

- save and re-use
- animal feed
- compost

### *Solids Separation Tips:*

To help maintain compliance with local wastewater discharge limits, the following solid waste Best Management Practices, developed by King County, Washington, are also recommended for Rhode Island breweries:

- Install screens, filters or baskets on all floor drains and trenches to capture solids.
- Prevent spent yeast, grains, hops, and trub from entering the sewer. Collect them from all filters, mash tuns, whirlpools, and kettles by settling, straining, screening or filtering them. Prevent them from entering the sanitary sewer.
- Use the correct gauge screen to maximize solids removal and install screens that are easy to access and service.
- Dewater collected solids and dispose off-site. Consider beneficial reuse.
- Collect spent yeast slurry for offsite disposal or beneficial reuse. If possible reuse the yeast for multiple generations. This is important because spent yeast slurry from fermentation/maturation tanks has high nutrient and high solids content. Large quantities of yeast lead to organic acids formation, which affects the pH (makes the wastewater more acidic).
- Control solids at the source; don't let the solids hit the ground, sweep up and collect spills, and avoid rinsing them down the drain.
- Train employees on solids management practices.
- *Beneficial reuse.* Again, as recommended by the Ohio EPA above, when disposing solids offsite, consider beneficial reuse. Seek opportunities to turn your solids and high strength waste into compost, fertilizer, animal feed, energy, or other authorized beneficial reuse.

### *Solids Removal and Management:*

In addition to the above tips, the national Brewers Association offers detailed guidance on solid waste reduction, removal and reuse. The following free, on-line publications provide good overviews of techniques and management options applicable to typical brewery operations: Water and Wastewater: Treatment/Volume Reduction Manual, Wastewater Management Guidance Manual, and Solid Waste Sustainability Manual (available at: <https://www.brewersassociation.org/educational-publications/>). Best practices topics covered in these publications include: *physical treatment*—screening, microfiltration, diatomaceous earth, plate and frame and rotary filters for solids removal; *chemical treatment*—pH adjustment, flocculation; and solids management, reuse and disposal for separated grains and yeast. The Brewers Association states that “spent grain and trub can be mixed together and sold (or given for free) to farmers as cattle feed or deposited to fields (e.g., hay crops or pasture land). [And that] potential disposal options [include] delivering to 1) a local wastewater plant to assist with denitrification or to their anaerobic digesters for methane potential, 2) a commercial

compost facility as a carbon and water source, or 3) a fertilizer plant.” Authors do caution, however, that “If you are using the material as animal feed, make sure you are indemnified for any misuse of this product by the hauler/farmer; it can cause bloating and other undesirable side effects in livestock when not correctly monitored.”

In Rhode Island, options for solids management include animal feed, agricultural compost farm operations, anaerobic digestion or disposal at the Rhode Island Resource Recovery Corporation/Central Landfill in Johnston. The Rhode Island Resource Recovery Corporation can be reached at (401) 228-3135 or <http://www.rirrc.org/>. Those interested in animal feed and agriculture compost operations should contact the Rhode Island Division of Agriculture at (401) 222-2781, hours 8:30 a.m. to 4:00 p.m. The Division of Agriculture works to sustain, promote and enhance Rhode Island's agricultural viability.

**Note:** Please be aware that some practices may be subject to RIDEM rules or regulations. If you have any questions regarding management of the above listed by-products or any other solid waste generated by brewery operations, please contact RIDEM's Office of Solid Waste at (401) 222-2797 or Division of Agriculture at (401) 222-2781.

#### WATER AND WASTEWATER:

According to the Ohio EPA, “on average, seven barrels of water are consumed for every one barrel produced by breweries, while 70 percent of the incoming water is discharged as effluent into the sewer system—this effluent is highly organic and can be expensive for Publicly Owned Treatment Works (POTWs) to treat.” To reduce water purchase and wastewater treatment costs, and maintain compliance with local and state regulations, please refer to RIDEM's Office of Water Resources “Wastewater Disposal Guidance for Breweries, Wineries & Distilleries” and the “IPP Fact Sheet”.