

Wastewater Management and Sustainable Practices for Rhode Island Craft Brewers

Rhode Island Brewers Guild Meeting
June 5, 2023



DEM
RHODE ISLAND

Overview

- ▶ Welcome from the Brewers Guild and Introduction from DEM (5 min)
- ▶ Wastewater Challenges in Brewing (15 min)
- ▶ What Local Limits Mean for Breweries & How to Meet Their Goals (15 min)
- ▶ Wastewater Q&A (15 min)
- ▶ Introduction to the Sustainable Craft Beverage Recognition Program (20 min)
- ▶ Best Practices for Organics Management (5 min)
- ▶ Sustainability Q&A (15 min)

How are Discharges to POTWs Regulated?

EPA

Federal Pretreatment Regulations at 40 CFR Part 403
Role: Ensure that State Regs are consistent with Federal Requirements



RIDEM

Delegated State Authority in 1984
State Pretreatment Regulations at 250-RICR-150-10-2
Role: Oversight of Approved IPPs and Issue permits in “non-approved” municipalities



Municipal Industrial Pretreatment Program (IPP)

Local Pretreatment Requirements in Municipal Ordinance, Rules, or Regulations

Role: Issue permits and enforce local regulations



But breweries aren't "Industrial" (a/k/a SIUs)...why regulate them?

- ▶ High strength wastewater
- ▶ POTWs have a finite capacity to treat wastewater (i.e., BOD and TSS)
- ▶ Potential to Impact the POTW - Summer 2018 Burlington, VT WWTF discharged 1.8 MG of partially treated wastewater into Lake Champlain. The cause was partially blamed on brewery discharges causing a WWTF upset.



Brewery Wastewater Characteristics



High-strength BOD

5,000 - 20,000 mg/L



Elevated TSS

3,000 - 15,000 mg/L



High Flows

5 - >15 gallons of
Wastewater/gallon product



pH

2 - 12 su depending upon
the cleaning/ disinfection
process



High Temperatures



How does this compare to other types of wastewater?

▶ Brewery Wastewater

- ▶ 15,000 mg/L BOD
- ▶ 500 gpd Flow
- ▶ 62.5 lb/d BOD

▶ Domestic Wastewater

- ▶ 250 mg/L BOD
- ▶ 300 gpd/House
- ▶ 0.625 lb/d/house

In other words...

500 gpd of brewery wastewater = 100 Houses

Or

500 gpd brewery wastewater = 30,000 gpd Domestic wastewater



Potential Impacts to POTWs

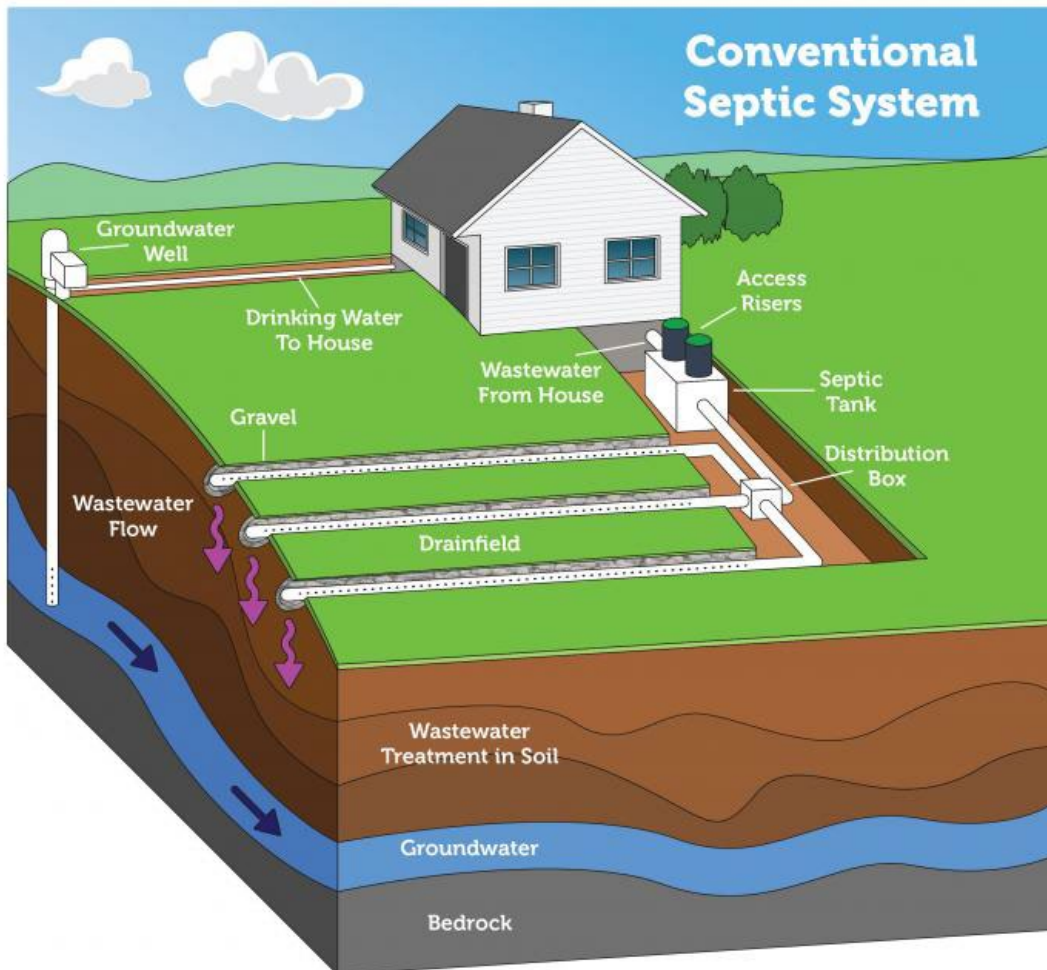
- ▶ Elevated BOD
 - ▶ Added aeration requirements to treat wastewater (increased electricity costs)
 - ▶ Increased solids production (increased disposal costs)
 - ▶ If exceeds treatment capacity, DO and nutrient impacts to the receiving water
- ▶ Elevated TSS
 - ▶ Increased solids production (increased disposal costs)
 - ▶ If exceeds treatment capacity, can impact disinfection and cause bacteria and turbidity impacts to the receiving water
- ▶ Elevated Temp and High/Low pH
 - ▶ Impacts to biological treatment resulting in loss of treatment (partial/complete)

Discharge Limits

BOD/TSS and pH limits applicable to those industries subject to Standard Industrial Classification (SIC) codes 2082, 2084, 2085. Information in the table below is meant for guidance ONLY and is subject to change. For limits specific to your WWTF please refer to your Individual Permit or contact the WWTF to confirm the limits applicable to your facility.

Examples of Discharge Limits

<i>Municipalities Served</i>	<i>BOD/CBOD (mg/L)</i>	<i>TSS (mg/L)</i>	<i>Surcharge Limit</i>	<i>Surcharge Rates</i>
Bristol	4,000 mg/L	4,000 mg/L	1,250 mg/L	Cost of permit fee
Burrillville	Contact the RIDEM Pretreatment Coordinator			
Newport Middletown	200 lbs/day	1,000	BOD: 300 mg/L TSS: 300 mg/L	BOD: \$0.17/lb TSS: \$0.06/lb
Narragansett South Kingstown	271 lbs/d	164 lbs/d	BOD: 250 mg/L TSS: 250 mg/L	Established by Town Council resolution



Please note: Septic systems vary. Diagram is not to scale.

Weston & SampsonSM

transform your environment

What Local Limits Mean for Breweries & How to Meet Their Goals

RI Brewers Guild – June 5, 2023

Know Your Wastewater

- Each WWTF has its own requirements
- Each brewery has its own waste profile
- How to deal with discharge limits?
 - Develop a relationship with your municipality
 - Gather data on your operation
 - Optimize your process

Know Your Wastewater

- Types of waste
 - Grain, trub, first rinse, bad beer
- Quantity
 - Total volume per day, peak flow rate
- Quality
 - BOD & TSS



Regulatory Considerations

- Surcharges
 - Additional cost for high strength waste
- Local Limits
 - Brewer's BMPs or pre-treatment needed
- Equalization
 - May be helpful for some WWTFs

Regulatory Considerations

- Additional effort will be needed
- What's the right approach? Weigh:
 - Money
 - Time (at brewery, in office)
 - Additional process complexity
- Consult with a *process WW* engineer

BMPs & Source Control

Divert high-strength wastes away from the WWTF:

- Reuse (animal feed)
- Compost/anaerobic digestion
- First rinse management



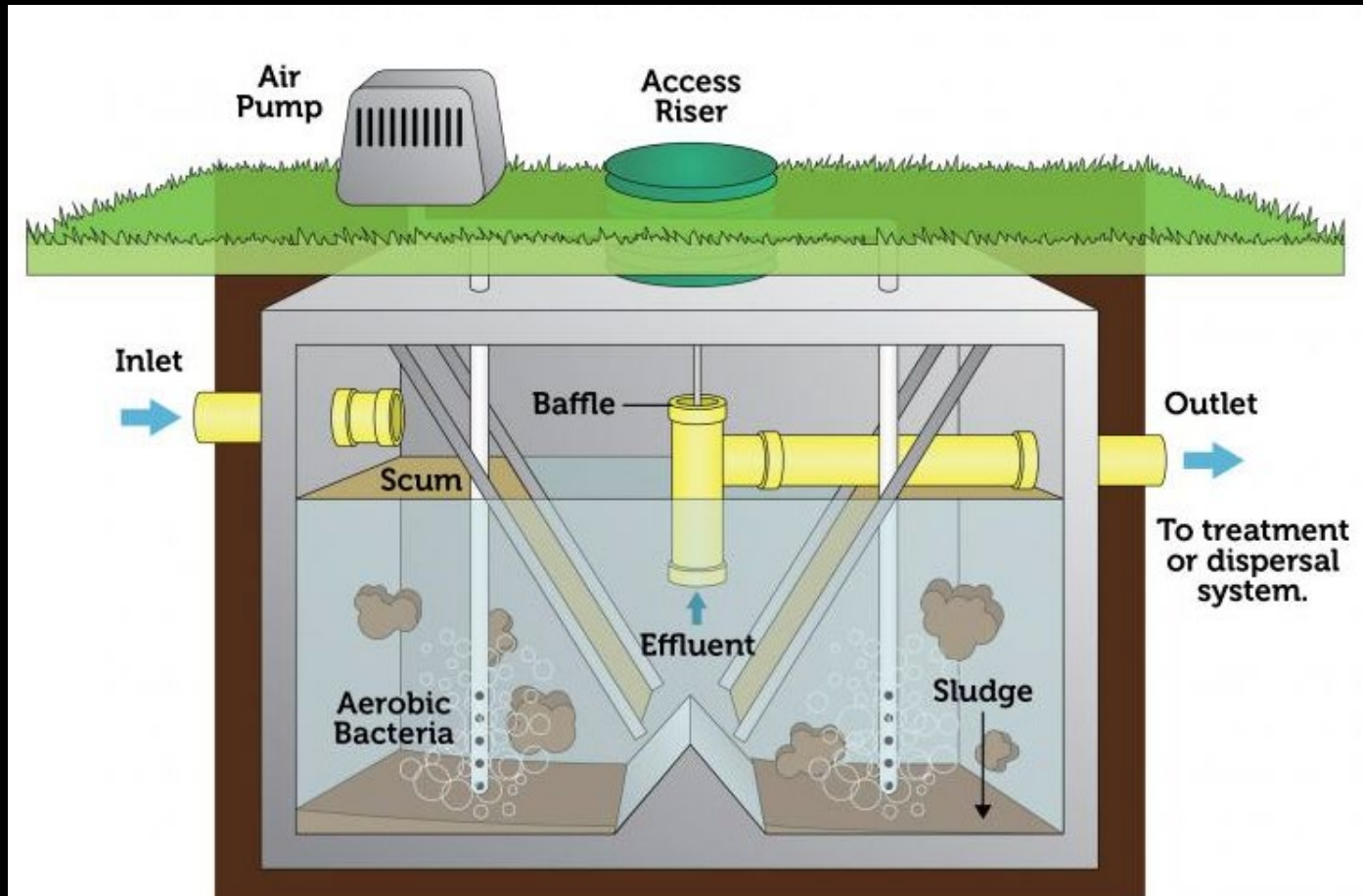
What to Sidestream?

- Off-spec product
- Solids
- First rinse runnings
- Spillage from racking, kegging, canning
- Waste beer from taproom
- Foam from growler fills

Wastewater Pre-Treatment

- Used when DIY efforts aren't enough
- Treatment train approach for mitigating solids, pH, BOD, TSS
- Many proprietary technologies available
- Consult with a *process WW* engineer

Pre-Treatment Schematic



Pre-Treatment Tech

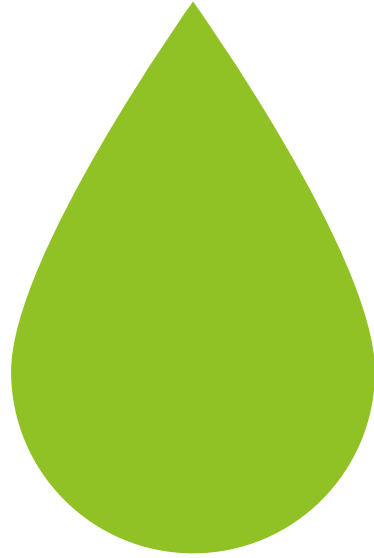


Pretreatment Coordinators

Wastewater Treatment Facility	Manager/ Coordinator	Phone	Email
Bristol	Shealyn Davey	(401) 253-8877 x-503	sdavey@bristolri.gov
Cranston	Al Tutela	(401) 861-5990	ajtutela@tutelaeng.com
E. Greenwich	Shawn O'Neill (primary) Dave Perrotta	(401) 886-8619 (401) 886-8619	soneill@eastgreenwichri.com dperrotta@eastgreenwichri.com
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Newport	Chris Fay	(401) 845-2000	christopher.fay@veolia.com
Quonset/QDC	Edward Davies (primary) Bill Young	(401) 294-6342 x-290 (401) 295-0044 x-224	edavies@quonset.com wyoung@quonset.com

Pretreatment Coordinators

Wastewater Treatment Facility	Manager/Coordinator	Phone	Email
Smithfield	Kevin Regan	(401) 231-1506	kevin.regan@veolia.com
S. Kingstown	Krystal Furlong	(401) 788-9771	kfurlong@southkingstownri.com
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Woonsocket	Reney Mondoux	(401) 766-1255 x-5111	rmondoux@woonsocketri.org



Wastewater Q&A

New England Sustainable Craft Beverage Recognition Program

- ▶ The performance standards establish a uniform minimal standard for recognition of craft beverage manufacturers under the New England Sustainable Craft Beverage Program.
- ▶ This standard is composed of 11 categories of sustainable practices, with options for how to meet the standards. Craft beverage manufacturers that meet a certain level of performance will be eligible for recognition under the program.

Performance Standards

- ▶ **Category 1: Input Tracking and Performance Goals**
 - ▶ Track bbl packaged, water, energy, CO2
 - ▶ Analyze data, establish KPIs, and set goals
- ▶ **Category 2: Equipment Maintenance & Leak Checks**
 - ▶ Replace HVAC air filters at least quarterly
 - ▶ Conduct leak checks for air, water, and refrigerant at least quarterly
 - ▶ Demonstrate adherence to a written SOP for equipment checks



Category 3

Culture of Sustainability



Have a sustainability mission statement



Implement training programs for sustainable practices



Maintain a sustainability section on website



Form a "Green Team" to promote sustainability



Provide transparency on env. performance



Participate in community outreach programs focused on environmental sustainability



Supporting local communities and economies by sourcing materials locally

Category 4

CIP/Sanitizing Processes



Develop an SOP for CIP and sanitizing



Consistently adhere to a written SOP



Train employees on proper use and storage of chemicals



Document that sanitizing occurred



Explore the use of greener cleaners

Category 5 Discharge Limits and Side- Streaming

- ▶ Do you have discharge limits for BOD, TSS, pH, temperature, and mass loading? please provide
- ▶ Be aware of and comply with local wastewater discharge regulations
- ▶ Side-stream heavily loaded wastewater streams, if required for compliance
- ▶ Do you use any pretreatment steps before discharging?

Category 6 Heat & Water Recovery

- ▶ Reuse final rinse waters
- ▶ Recover process heating/cooling such as from HLT/CLT
- ▶ Describe current practices (throughout)



Category 7

CO2 Conservation & Recovery


- ▶ Use CO2 capture technology
- ▶ Track CO2 usage in tank emptying, centrifuge, bottling line, bowl, purging and elsewhere
- ▶ Perform an ultrasonic audit on CO2 infrastructure
- ▶ Switch from timed purging to using dissolved oxygen and/or carbon dioxide sensors

Category 8

Waste Reduction/Recycling

- ▶ Divert packaging waste (e.g., bottles, cans, shipping) from landfill
- ▶ Implement recycling programs in tap rooms and restaurants
- ▶ Use a grain silo for bulk grain delivery
- ▶ Use reusable dinnerware in taproom/ restaurant
- ▶ Divert food waste from tap rooms and restaurants



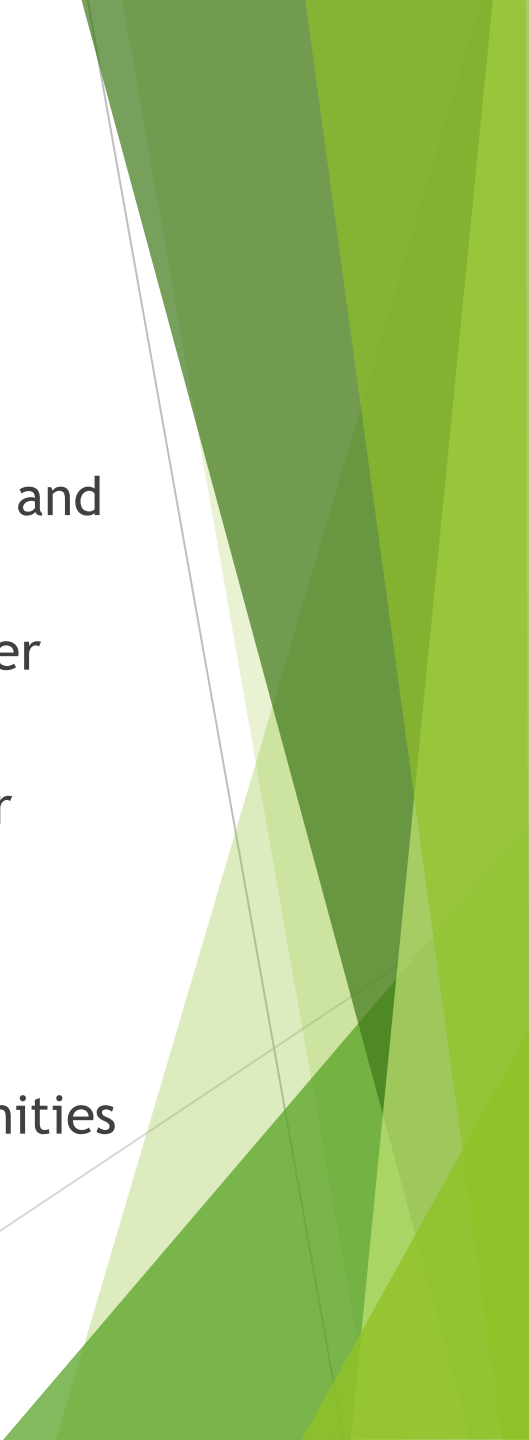


Category 9 Spent Grain Diversion

- ▶ Divert spent grain from landfill
- ▶ Identify where spent grain is being diverted



Category 10 Insulating & Hot Water Efficiency

- ▶ Install insulation jackets on heaters and pipes
 - ▶ Use on-demand or tankless hot water systems
 - ▶ Install heat pump or solar hot water systems
 - ▶ Set water temperature back to 120 degrees for non-food use
 - ▶ Implement weatherization opportunities to the building envelope
- 

Category 11 State/Local Compliance

- ▶ Have no egregious violations of state or local environmental regulations

OR

- ▶ Have a plan for returning to compliance if currently out of compliance and disclose it to the local authority

OR

- ▶ Have compliance concerns and would like technical assistance



RI Brewers Guild

Ripe Opportunities for Food Waste Diversion

Abbey Massaro

Waste Reduction Consultant



**We help people and businesses save
energy and reduce waste**



Center for EcoTechnology Partners



U.S FOOD WASTE

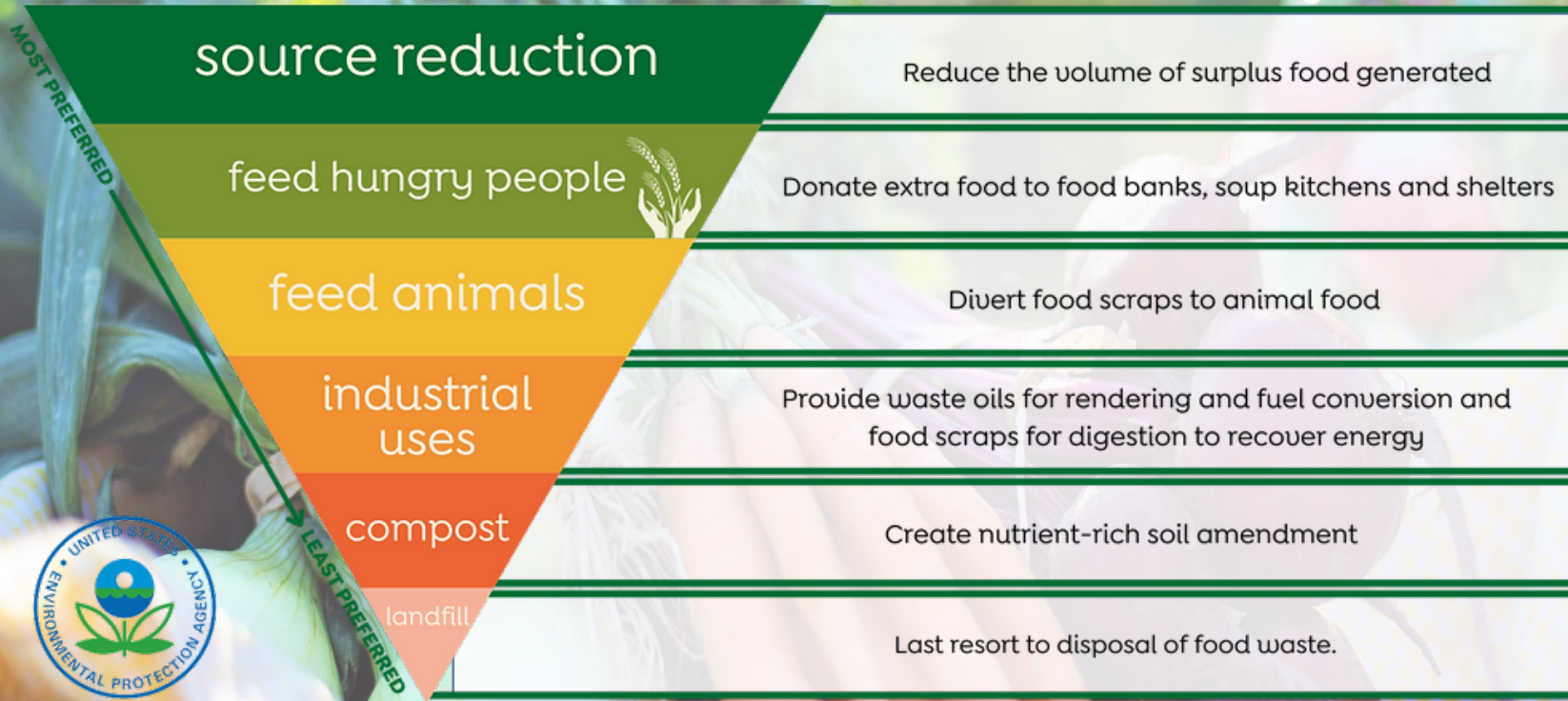
Did you know?

- 30-40% is wasted
- Valued at \$165 billion annually
- Rotting food in landfills releases greenhouse gases

Source: NRDC

CLIMATE  CENTRAL

FOOD RECOVERY HIERARCHY:



Benefits of Diverting Wasted Food



Avoids purchasing and disposal costs



Can feed food insecure people in your community



Provides a tax benefit



Marketing Edge



Sustainability Goals

No-Cost Technical Assistance

Site evaluation

In-person or virtual visit to evaluate existing waste streams and learn about waste reduction goals

Recommendations

Customized report of opportunities to prevent, recover, and divert wasted food

Implementation

Support through the implementation of new strategies, direct connections to service providers

Education

Signage, staff trainings, and more



MA | CT | RI | ME | NH
NY | NJ | PA | MD | OH

Apponaug Brewing Company

Rethinking portion sizes

Repurposing ingredients

Reusing items

Supported in collaboration with
RI DEM and EPA Region 1.



www.apponaugbrewing.com



\$780 savings/year
in reduced hauling
costs



Educational signage for staff and customers

Collects 600-700 pounds of food scraps per week for composting

Reduced nuisance conditions in trash area



QUESTIONS?

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www.wastedfood.cetonline.org





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Resources

- ▶ Visit <https://dem.ri.gov/environmental-protection-bureau/water-resources/permitting/ripdes> and scroll to "Guidance for Breweries"
- ▶ [Industrial Pretreatment Program Factsheet for Breweries, Wineries & Distilleries](#)
- ▶ [Wastewater Disposal Guidance for Breweries, Wineries & Distilleries](#)
- ▶ [Solid Waste Guidance for Breweries, Wineries & Distilleries](#)
- ▶ [Rhode Island Outlets for Brewer Solid Waste](#)
- ▶ [Sampling for NPDES Wastewater Discharges](#)