

## **Alcoholic Beverage Manufacturing**

Tennessee has a long history of producing alcoholic beverages, some legal, some illegal. Over the past decade there has been a proliferation of wineries, breweries, and distilleries, some are large but most are small.

### **Beverage Wastewater Concerns**

Generally speaking, standard sewer use ordinance language and local limits are adequate to properly regulate the wastewater discharge from these businesses. There are exceptions. Large businesses may be classified as “significant industrial users” based on flow more than 25,000 gpd. Because most pollutants discharged from beverage manufacturers fall under the “conventional” description, it is very important that plant operators know the removal capacity and current loading of their plant.

Solids- sanitary sewer systems are poorly equipped to receive large amounts of spent grains or other waste solids. Most sewer use ordinances clearly address this, perhaps with numeric limits; and if not, then with narrative limits which prohibit “solid or viscous” materials that interfere with the normal operations. The various manufacturer’s generally dispose of spent grains as livestock feed. At least one Tennessee city experienced improper discharge of distillery grains even after the distillery was told “not” to make the discharge.

BOD/CBOD- ethanol has a theoretical BOD of about 500,000 mg/L. Though biodegradable, slug loads of alcoholic beverages can overload a treatment plant and cause violations. One Tennessee treatment plant has been slug loaded with 5,000 gallons of 190 proof “bad” whisky. There was an impact, but thankfully not too severe. Some spillage is normal, and low levels of BOD can be treated provided the municipal plant has the organic capacity. Again, most sewer use ordinances address high strength with narrative limits that prohibit inhibition & pass-through, some with surcharge levels, perhaps fewer with numeric maximum levels.

pH- as with most food processing companies, beverage manufacturing companies use both acid and caustic cleaning cycles. The acid cycles could impact the sewer collection system equipment if not neutralized or equalized. The EPA lower pH limit is 5, some cities have higher values for this low pH limit. High pH generally does not impact sewer systems to the same extent, but most ordinances do have upper pH limits.

Cleaners- various cleaners and surfactants may be used. Most are biodegradable, but large volumes, especially if slug loaded, can interfere or cause pass-through.

Temperature- beverage manufacturing will involve elevated temperatures. If a large manufacturer is discharging into a small utility this may be a concern, but so will other pollutants.

Distiller Cautions- ethanol can be a fire and explosive hazard. The atmospheric LEL is 3.3% which is lower than methane. Any downstream lift stations should have the appropriately chosen electrical

equipment and it should be carefully maintained. Distillers must give timely notice to a city if there is a spill or discharge that could create an explosive hazard.

Brewery Cautions- brewing equipment is often passivated with various acids to protect the equipment and protect the beer from off flavors. With stainless steel equipment, sometimes clad with external copper for appearance, the acids remove iron which is generally an unregulated metal. Pure copper equipment may have a copper slug discharge even after pH is adjusted. At this time, EPA has offered no guidance regarding breweries passivating and the 433 metal finishing category.

Dr. Larry Moore, Professor, Emeritus University of Memphis, reports raw brewery wastewater has a BOD of 1,000-5,000 mg/L and TSS of 300-1,500 mg/L. Information from Fort Collins, Colorado, sets "wort" (liquid from the mashing process that is very high in sugars) and "bad beer" BOD in the range of 80,000-120,000 mg/L.

Communications- the beverage industry speaks its own language. Often various words are used to mean the same thing and their usage of a word may not match how utility personnel use a word. Be very careful and deliberate in communications. The "industrial wastewater survey/application" is always a first step in getting a clear understanding of an industries wastewater. The more detail and the more forthright the industry is in the survey the easier it is to make good decisions about its wastewater discharge.

Existing micro brewers and distillers-there are no reported incidences of micro brewers or distillers causing interferences or pass-through at Tennessee wastewater utilities.