

# Craft Brewing & Water:

## *Use, Reuse, and Sustainable Practices*



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# Key Statistics

- 7,346 Craft Breweries in U.S.
  - Approaching 1,000 in CA alone.
- ~200 million bbls brewed
  - 6.2 billion gallons
- Average Water Use Ratio of 7:1\*



Annual Water Consumption of ~43.4 billion gallons in the USA.

\*Brewers Association Water and Wastewater: Treatment/Volume Reduction Manual

# Visualizing 43.4 Billion Gallons of Water

- USS IOWA (BB-61 Battleship)
- Enough water to float 3,181 of these!





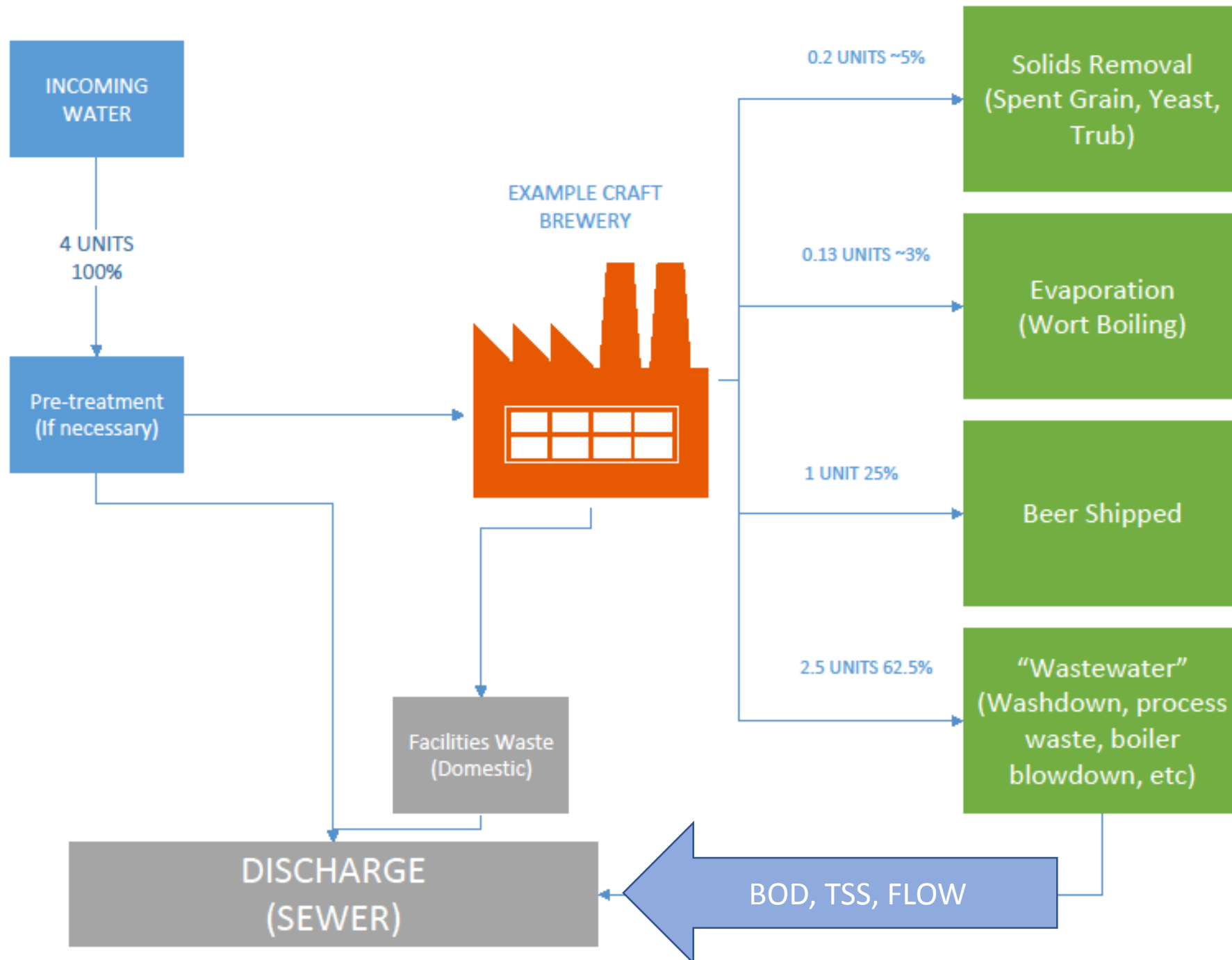


**384,400 km**

## 30" Diameter Column of Water





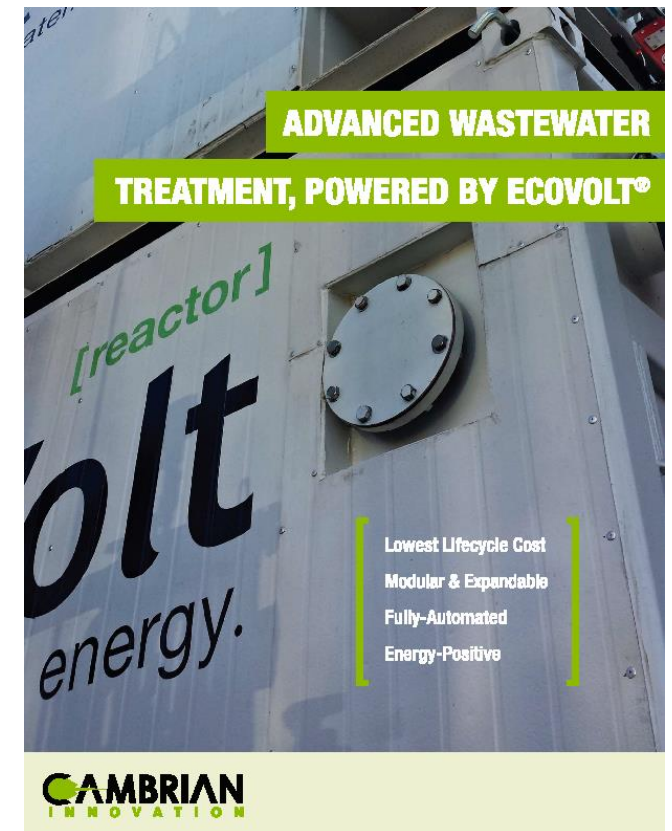




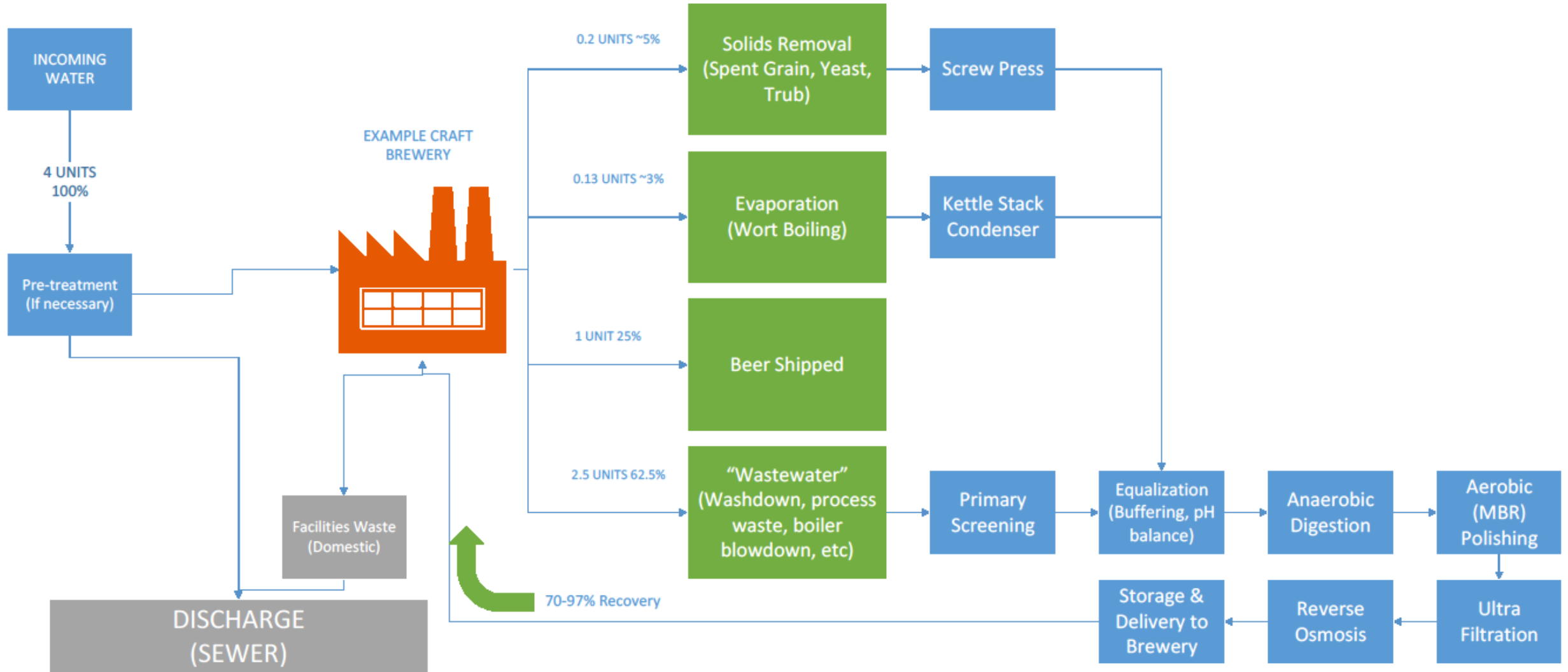
# Wastewater Reclamation; Recycling

## Stepwise Process

1. ***Sidestreaming.*** Waste that isn't worth processing (yeast, grain)
2. ***Solids Removal.*** Screen larger sized particles ( $>0.5\text{mm}$ )
3. ***Equalize,*** pH buffer, agitate wastewater in a large tank.
4. ***Anaerobic*** Treatment. Acidophiles & Methanogens.
5. ***Aerobic*** Polishing via Membrane BioReactor
6. ***Final Treatment.*** Ultrafiltration, R.O., Sanitization
7. ***Re-Use This Water in the Brewery.***







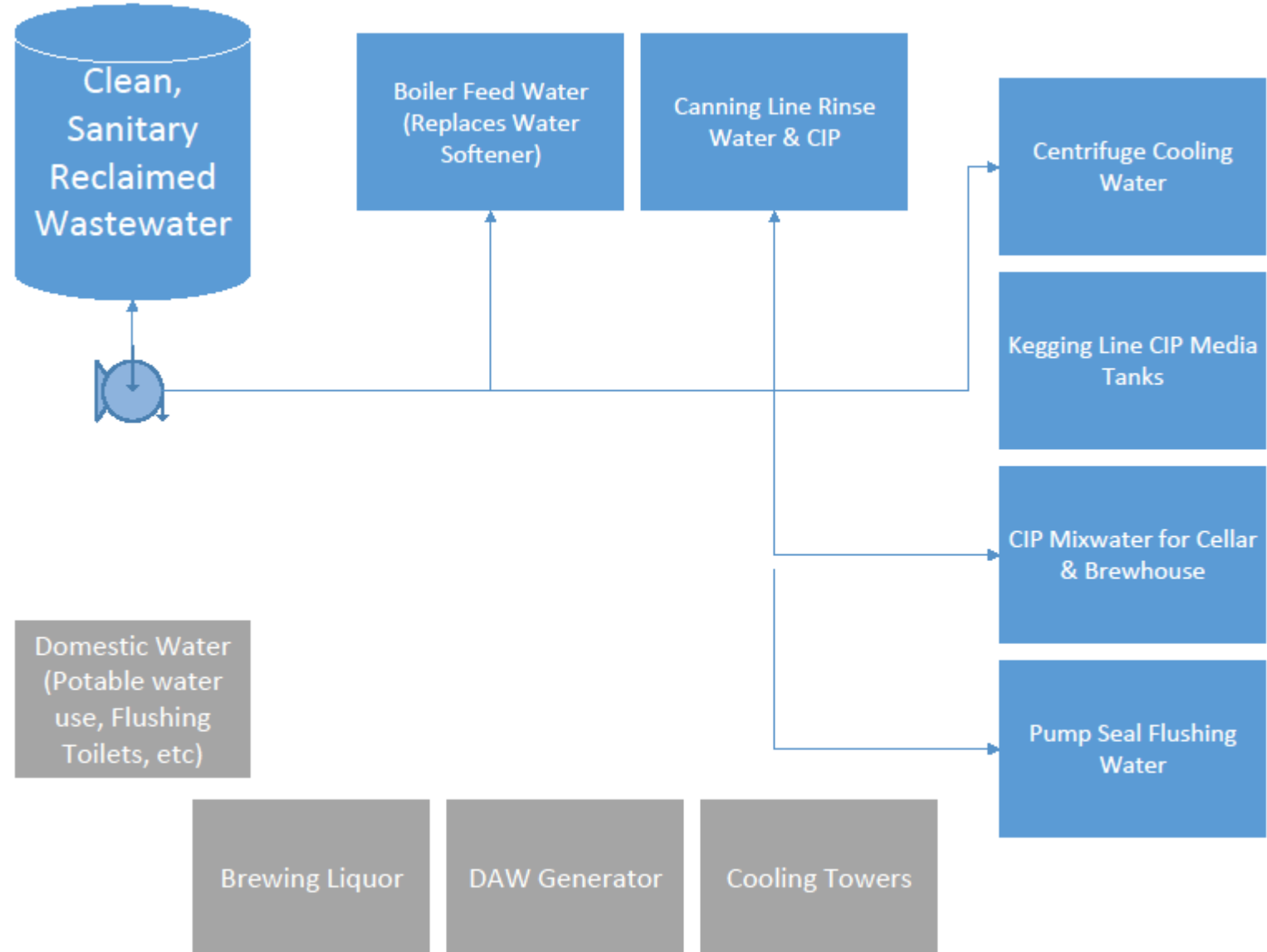
## 8. Find a way to use this reclaimed water in the brewery.

### Good Uses

- Cleaning
- Cooling
- Steam Generation
- Mixwater

### Not Allowed (Currently)

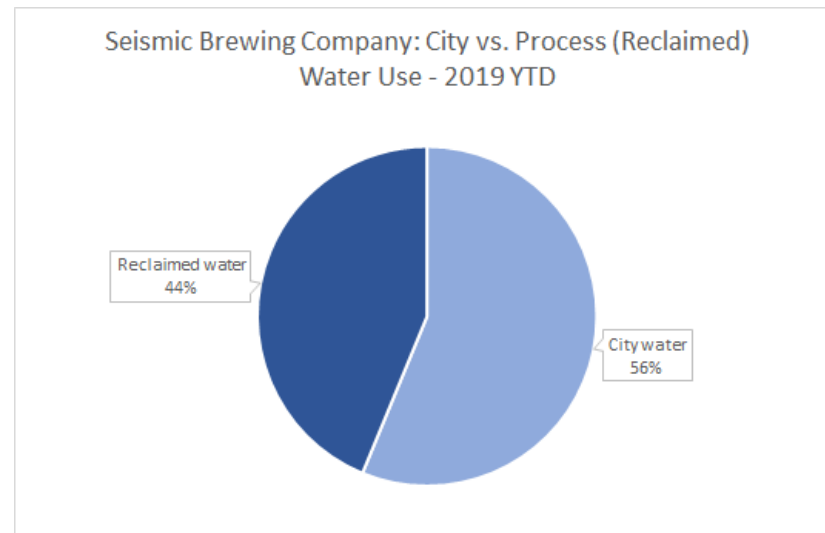
- Brewing Liquor
- Potable Use





# Summary

<b><i>YTD - City vs Reclaimed Water Use</i></b>		
<b>Type</b>	<b>Volume (gal)</b>	<b>Percent</b>
City water	100,218	56.2
Reclaimed water	78,034	43.8



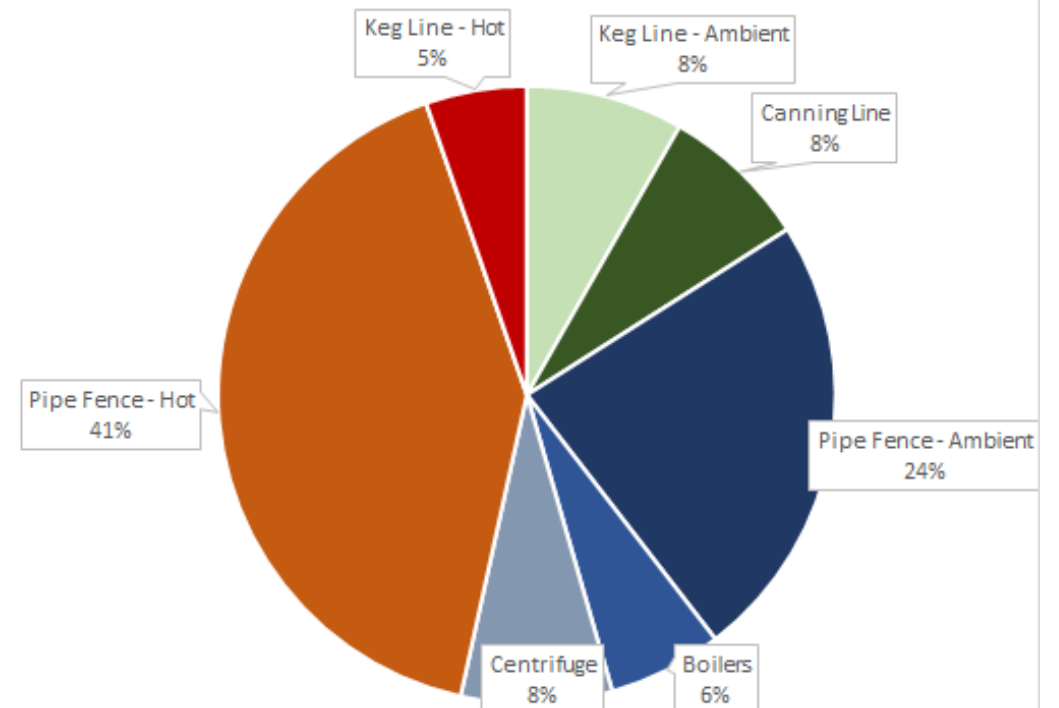
<b><i>YTD - City Water:Beer Packaged</i></b>		
<b>City Water</b>	<b>Beer Packaged</b>	<b>Ratio</b>
100,218	30,584	3.28

# Reclaimed Water

**YTD - Pie Chart Template - Process Water**

Location	Volume (gal)	Percent
Keg Line - Ambient	6,431	8.2
Canning Line	6,052	7.8
Pipe Fence - Ambient	18,371	23.5
Boilers	4,680	6.0
Centrifuge	6,178	7.9
Pipe Fence - Hot	32,187	41.2
Keg Line - Hot	4,135	5.3
Total	78,034	100.0

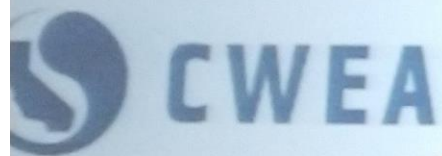
Seismic Brewing Company: Process Water Use 2019 YTD







Nominated by the City of Santa Rosa









# Thank you!

