Water Mapping and Wastewater Reduction at Phillips Distilling Company

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Company Background

• 106-year-old, family-owned spirit manufacturing company
  • UV Vodka, Prairie Organic Spirits, Revel Stoke Whisky

• 250+ employees in Princeton, MN

• Mid-sized industry leader
Project Overview

- One Team G.R.E.E.N. sustainability initiative
  - Perform wastewater study to establish baseline sources in 2018
  - Evaluate wastewater to reduce by 10% by 2020

- Part I
  - Water mapping, data and information collection

- Part II
  - Areas for improvement and recommendations for wastewater reduction
Approach

• Performed overall water balance from 2017 utility invoices
• Calculated water balance from individual processes
  • Watched daily procedures
  • Measured and calculated water usage at each step
  • Estimated annual distribution of water
• Identified which areas use most water, looked for improvements
• Worked with engineer on existing water reduction projects
Production Process Washouts
Distribution of Water Usage

Product

Production Waste
- Tank washouts
- Hose washouts
- Filler washouts
- Line washouts
- Other

RO Reject

Irrigation

Unaccounted

Lab use

Other domestic
Primary Recommendation – Tank Washouts

• 3,000+ tank washouts annually
• General procedure:
  • Spray ball rinse for 30 seconds
  • Repeat 3-4 times
• Actual length and number varies with operator and product
• Current system:
  • 330,000 gallons/year for regular washouts
  • $41,300/year in water and wastewater charges
Primary Recommendation – Tank Washouts

• **Recommendation – reduce rinses to 20 seconds**
  • Samples of rinse water collected and tested
  • Shorter rinses tasted and smelled clean
  • Implementation only a brief training and timers

• **Updated system:**
  • 171,500 gallons/year for regular washouts
  • $21,500/year in water and wastewater charges
  • Yearly savings – 157,300 gallons ($19,700)
## Solutions

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Annual reduction</th>
<th>Total cost</th>
<th>Annual savings</th>
<th>Payback period</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage tank washouts</td>
<td>157,000 gal water</td>
<td>$220</td>
<td>$19,700</td>
<td>0.01 years</td>
<td>Recommended</td>
</tr>
<tr>
<td>Production handwashing</td>
<td>22,200 gal water</td>
<td>$150</td>
<td>$2,800</td>
<td>0.05 years</td>
<td>Recommended</td>
</tr>
<tr>
<td>Bathroom sink aerators</td>
<td>24,100 gal water</td>
<td>$370</td>
<td>$380</td>
<td>0.97 years</td>
<td>Recommended</td>
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<tr>
<td>Leak repairs</td>
<td>18,400 gal water</td>
<td>Investigating</td>
<td>$2,300</td>
<td>Investigating</td>
<td>Investigating</td>
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<tr>
<td>Hose replacements</td>
<td>8,400 gal water</td>
<td>$270</td>
<td>$1,000</td>
<td>0.25 years</td>
<td>Recommended</td>
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<tr>
<td>RO reject reuse for irrigation</td>
<td>1,000,000 gal water</td>
<td>Investigating</td>
<td>$5,200</td>
<td>Investigating</td>
<td>Testing</td>
</tr>
<tr>
<td>Cream byproduct to St. Cloud</td>
<td>4,100 lbs COD</td>
<td>Investigating</td>
<td>N/A</td>
<td>N/A</td>
<td>Implementing</td>
</tr>
</tbody>
</table>
Personal Benefits