

# Water Mapping and Wastewater Reduction at Phillips Distilling Company

Eleanor Green

MnTAP Advisor: Michelle Gage

Company Supervisor: Larry Jurik



UNIVERSITY OF MINNESOTA

Driven to Discover<sup>SM</sup>

# 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



**PHILLIPS**  
**DISTILLING CO**  
• • •  
SINCE 1912

# Project Overview

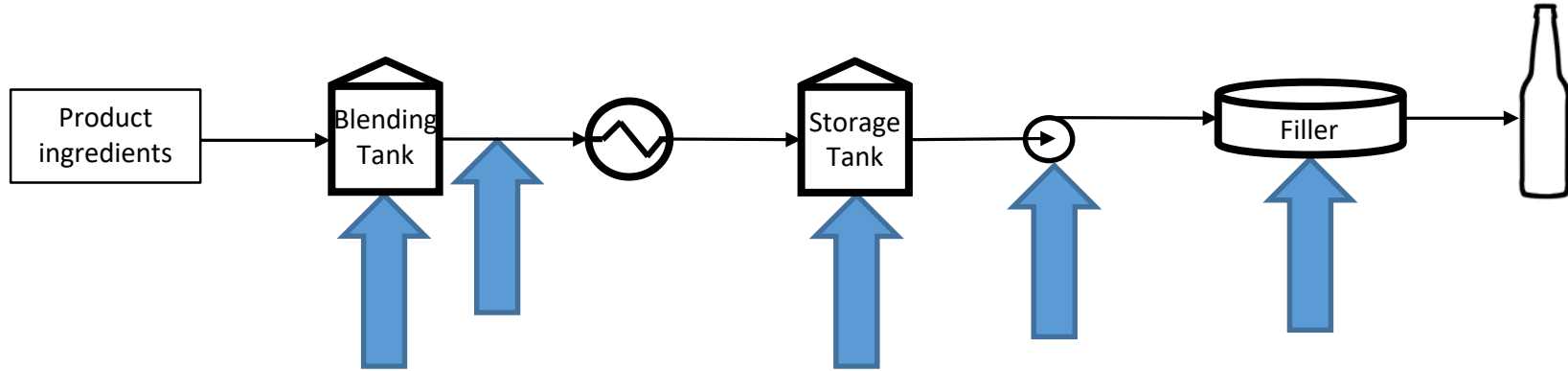
- **One Team G.R.E.E.N. sustainability initiative**
  - Perform wastewater study to establish baseline sources in 2018
  - Evaluate wastewater to reduce by 10% by 2020
- **Part I**
  - Water mapping, data and information collection
- **Part II**
  - Areas for improvement and recommendations for wastewater reduction



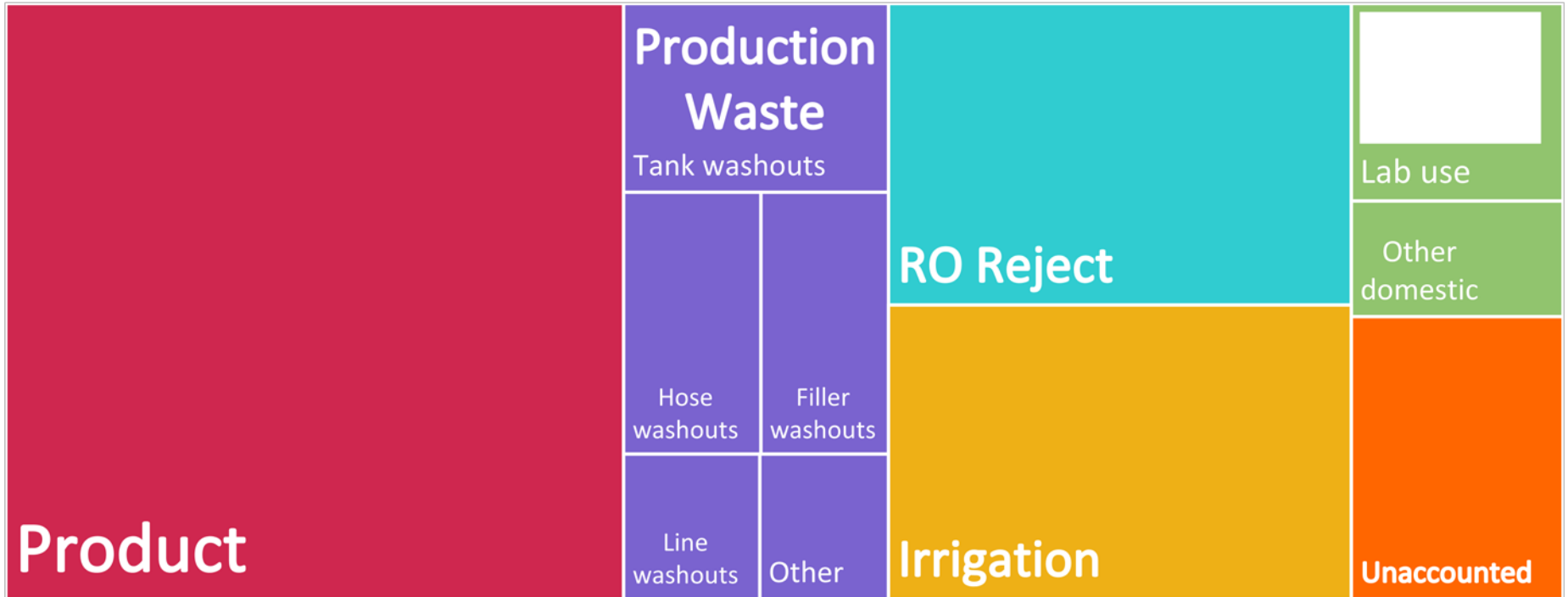
# Approach

- **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



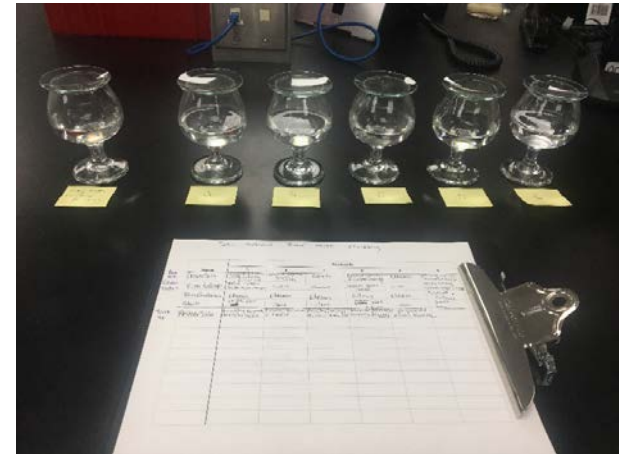
# Primary Recommendation – Tank Washouts

- **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

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

# Personal Benefits



— FAMILY OF —  
**GOOD SPIRITS**