



**CIP: Water & Resource Reduction**

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# 2013-14 California Drought

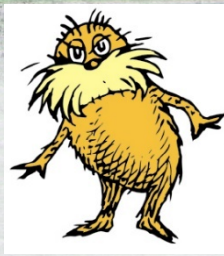


Cloverdale one of seventeen cities in California within 100 days of running out of water

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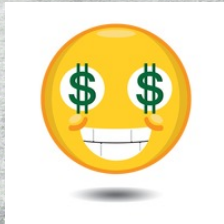
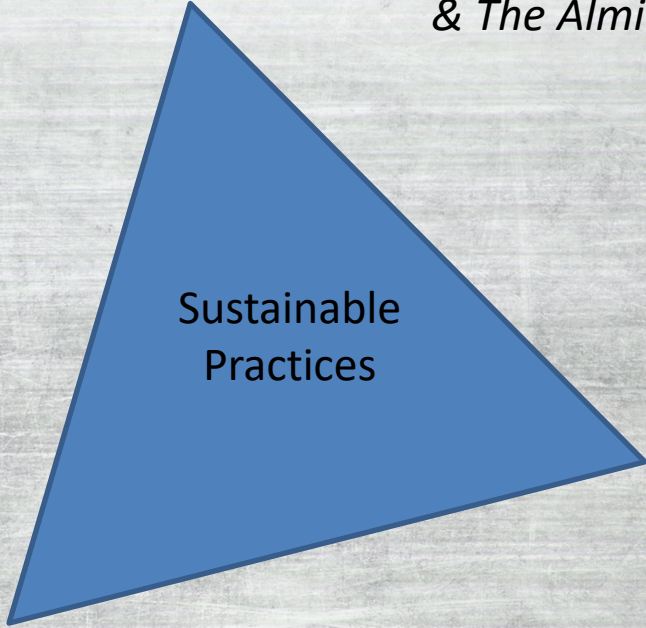


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# Why Care?

*The Lorax, The Law  
& The Almighty Dollar*



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## *Our crew:*

- Fantastic Brewers
- Rugged Individuals
- Free Thinkers
- Creative Wizards



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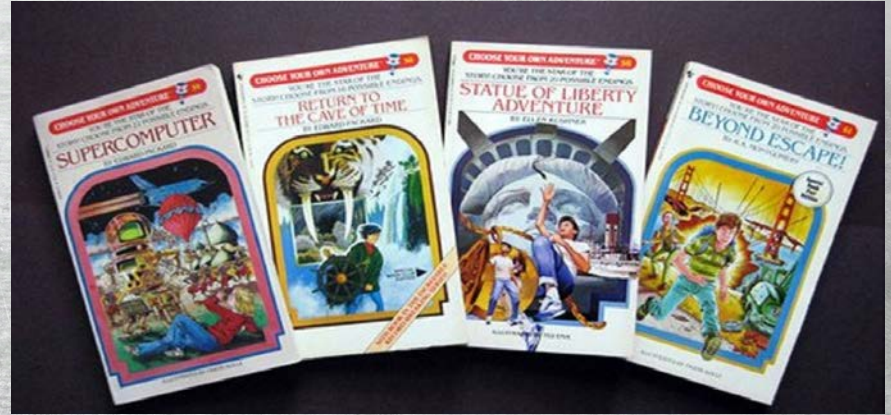


# Create Robust CIP Recipes



Perfect Execution

VRS:



Choose Your Own  
Adventure

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## *Our CIP Recipe (basic)*

- Drain tank bottoms
- Remove Carbon Dioxide
- Pulse rinse to
  - loosen soils
  - Raise temperature of vessel
- Batch caustic solution
- Verify solution strength
- Circulate chemical batch
- Pulse rinse chemical from vessel

*Savings in each of these steps*

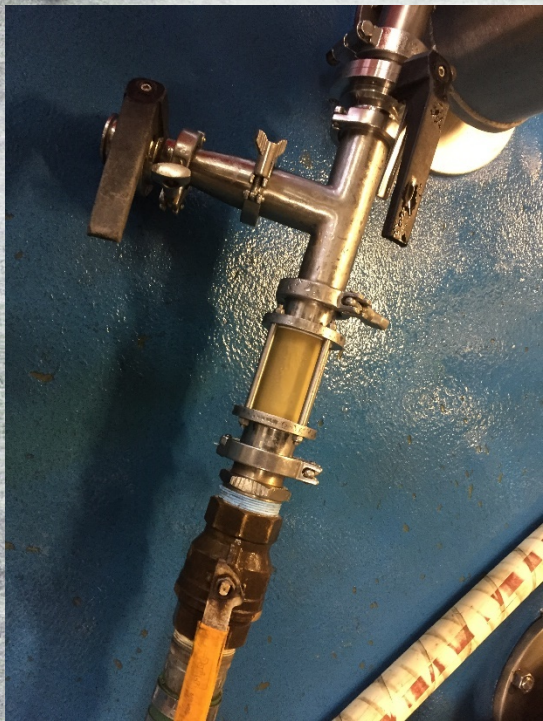
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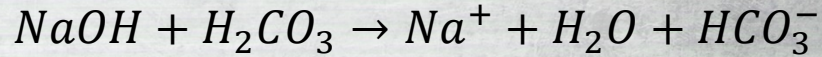
# Drain tank bottoms



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# Remove CO<sub>2</sub> w/o H<sub>2</sub>O



Things Change



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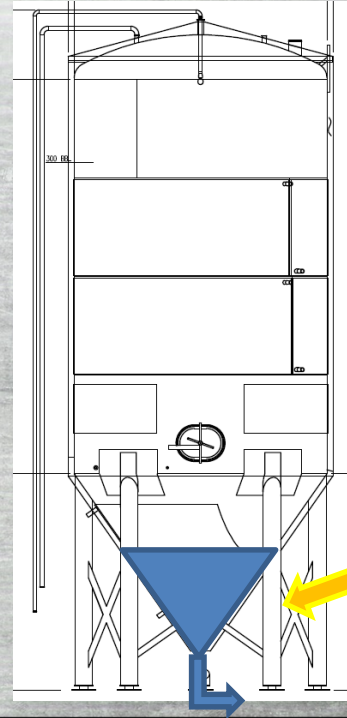
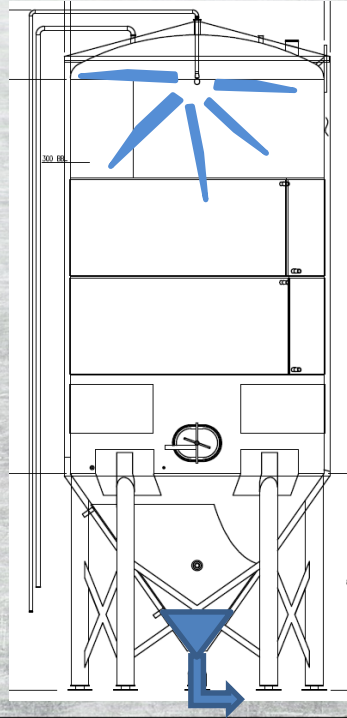
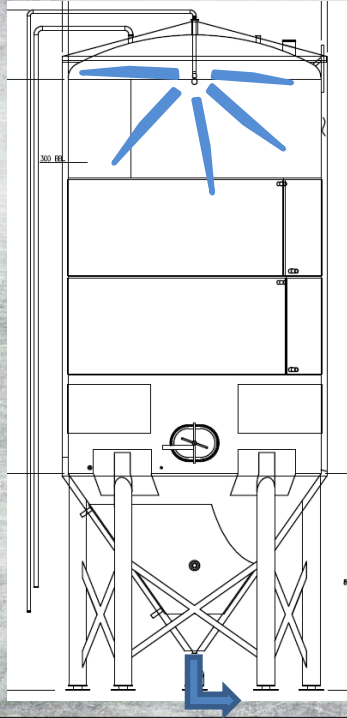
# Rinsing



- Incorporate Pulse Rinsing
- Install & use flow meters
- Create optimized rinse recipe



# Continuous Rinsing: The Problem



Dilute  
Chemical

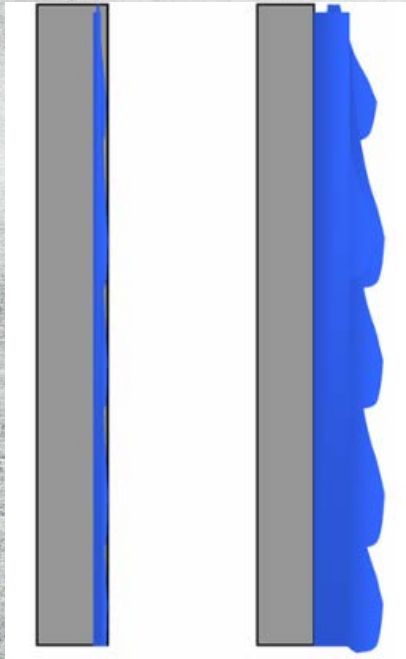
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# Continuous Rinsing The Problem # 2



- Thin film of cleaning solution coats tank
- Rinse water moves on top of this
- Pulse rinsing 25 – 50 percent less water

appropriated from:

*Comparing Different Rinsing Methods Used During Cleaning-in-Place of Process Vessels to Minimize Water Use*

*MBAA TQ 1994*

George Agius and Doug Funnell

JohnsonDiversey Inc., Oakville, ON, Canada

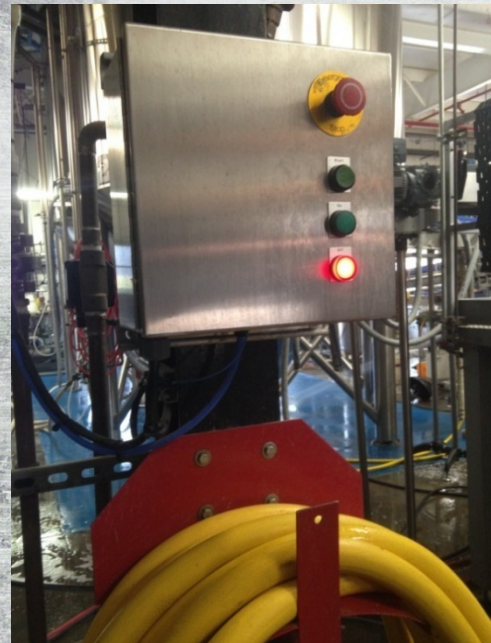
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# System to Eliminate Dreaded Bathroom Break Rinse



Push Button/ Timed Relay



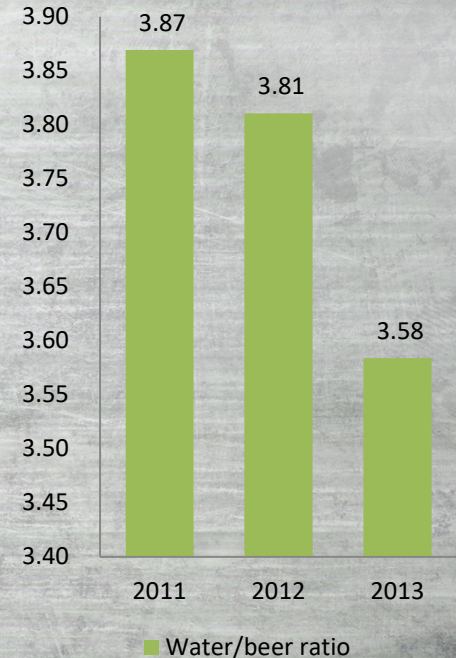
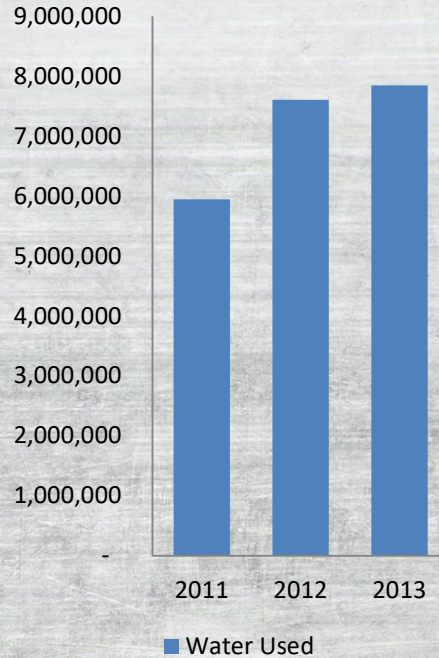
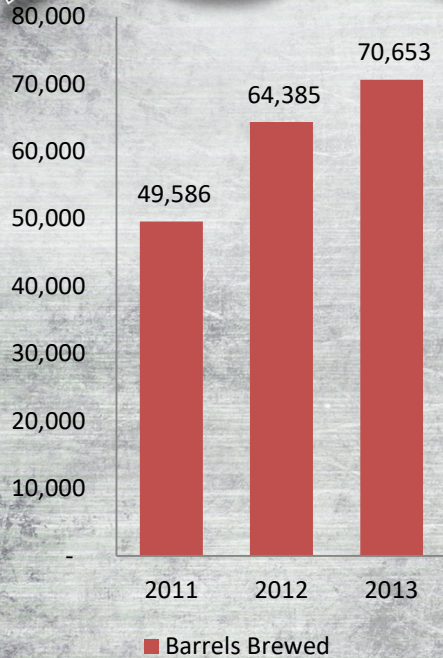
Pneumatic Valve



Flow Meter w/ 4-20 output



# CIP Water Savings



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# Titration and Test Strips



- Titrate & adjust chemical to maximize impact and minimize use.
- Make nice with your vendor. They should be a huge resource for you.

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# What We Saved

\$1.12/bbl savings

Process	Savings	\$\$\$/yr
Tank Bottoms as feed	208,000 gal to drain	\$58,286 in surcharges
Rinsing (cold)	725,400 gallons water	\$9,430
Rinsing (hot)	241,800 gallons water + 4,038 therms natural gas	\$3,143 + \$4,038 = \$7,181
Caustic	2,080 gallons caustic	\$12,400

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Thank  
You



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