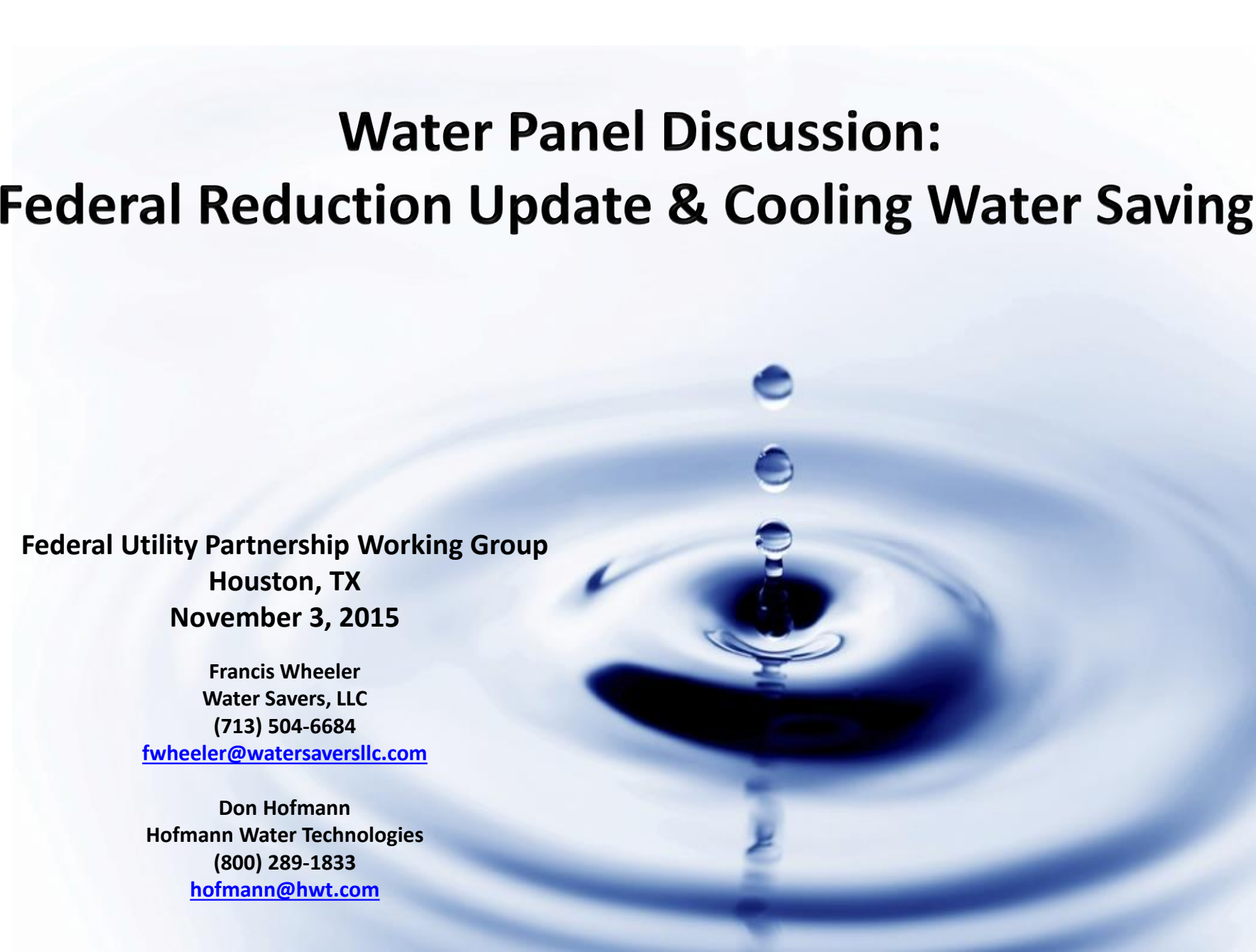


Water Panel Discussion: Federal Reduction Update & Cooling Water Savings

**Federal Utility Partnership Working Group
Houston, TX
November 3, 2015**

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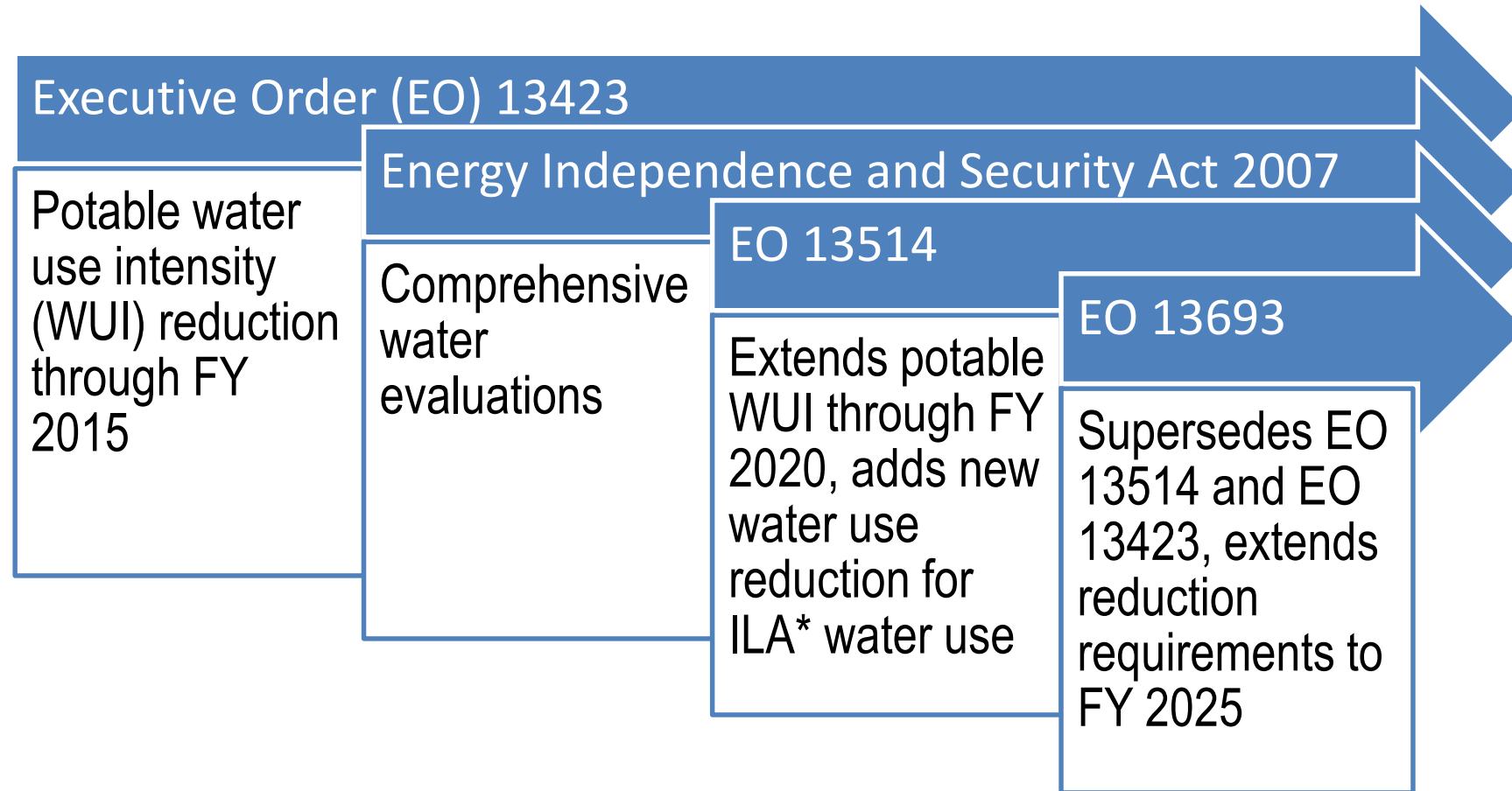


Certifications and Training

Certifications and credentials: CWEP, LEED AP, CEM, CLIA, CLEP, CLIC, CLID and Water Sense Partner



Federal Water Efficiency Mandates



*ILA = industrial, landscaping, and agricultural

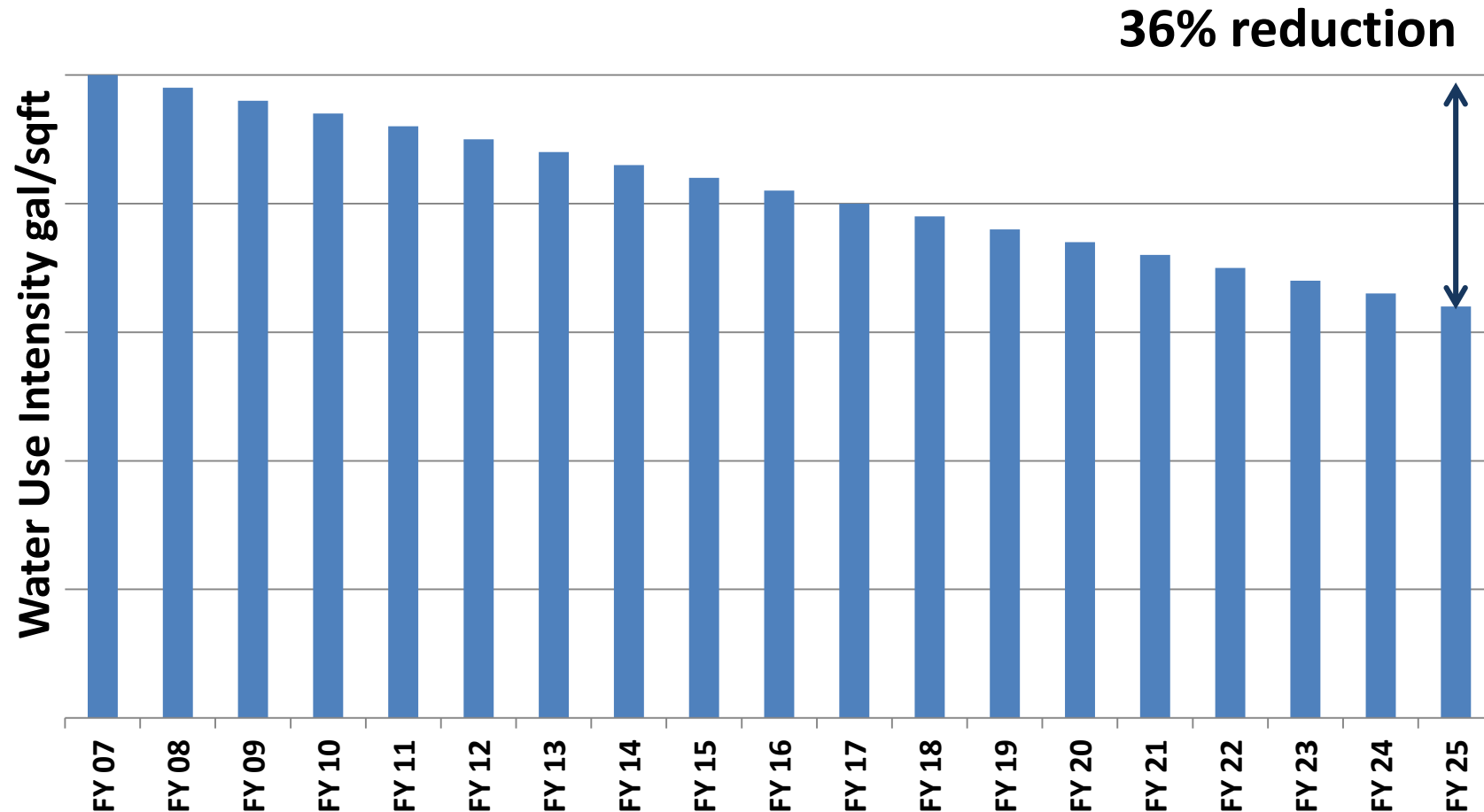
EO 13693 Water Provisions

Planning for Federal Sustainability in the Next Decade

- Reduce potable WUI 2% per year through FY25 from a FY07 baseline
- Reduce industrial, landscaping, and agricultural (ILA) water use by 2% per year through FY25 from FY10 baseline

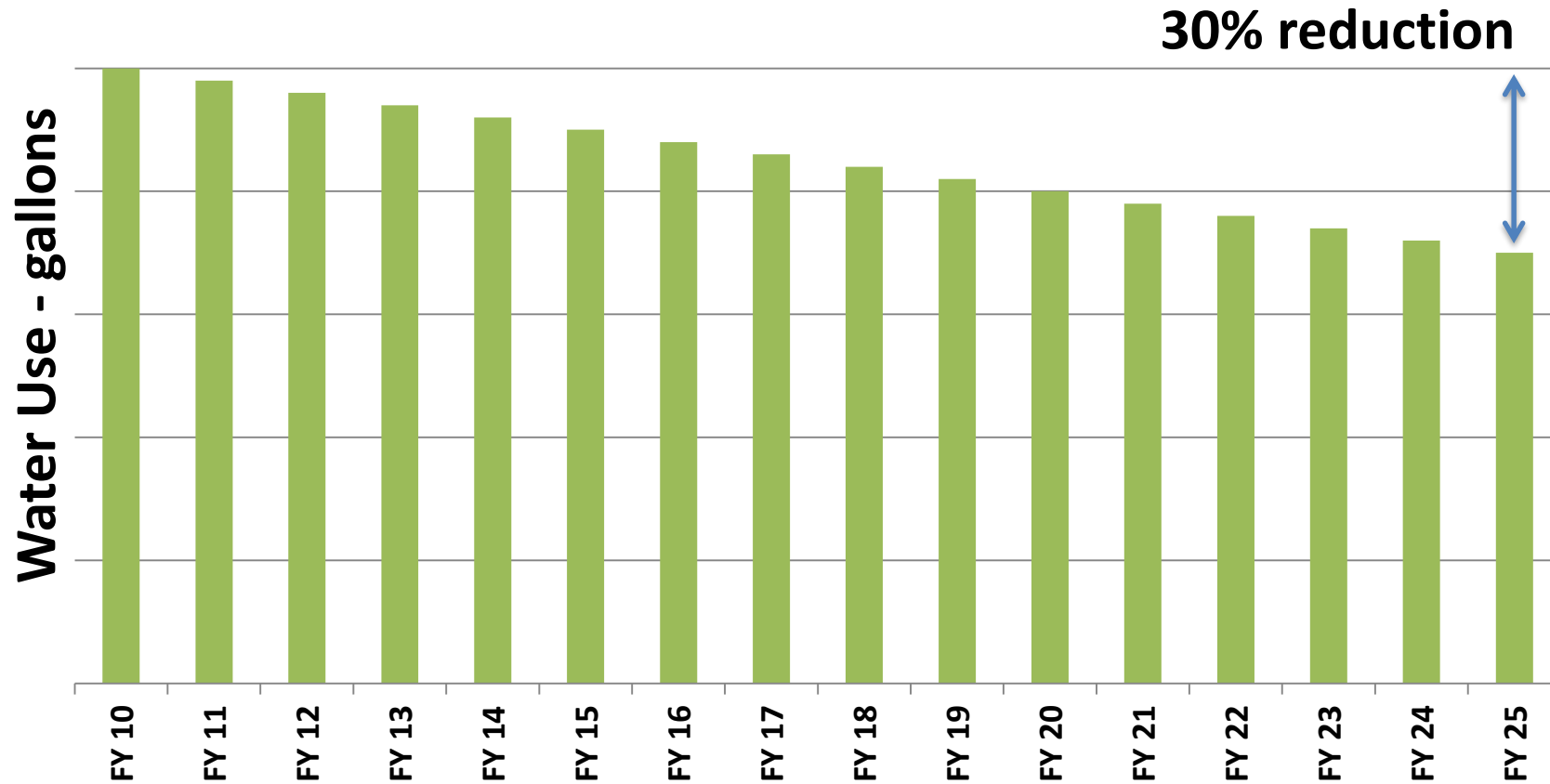
Potable Water Use Intensity (WUI) Reduction

- WUI reduction: gallons per square feet of facility space
- 2% per year from FY07 through FY25



ILA Water Reduction

- ILA volumetric reduction: gallons
- 2% per year from FY10 through FY25



EO 13693 Water Provisions

Planning for Federal Sustainability in the Next Decade

- Construct and renovate Net Zero Water buildings

EO 13693 Definition: Net zero water building means a building that is designed, constructed, or renovated and operated to greatly reduce total water consumption, use non-potable sources as much as possible, and recycle and reuse water in order to return the equivalent amount of water as was withdrawn from all sources, including municipal supply, without compromising groundwater and surface water quantity or quality.

EO 13693 Water Provisions

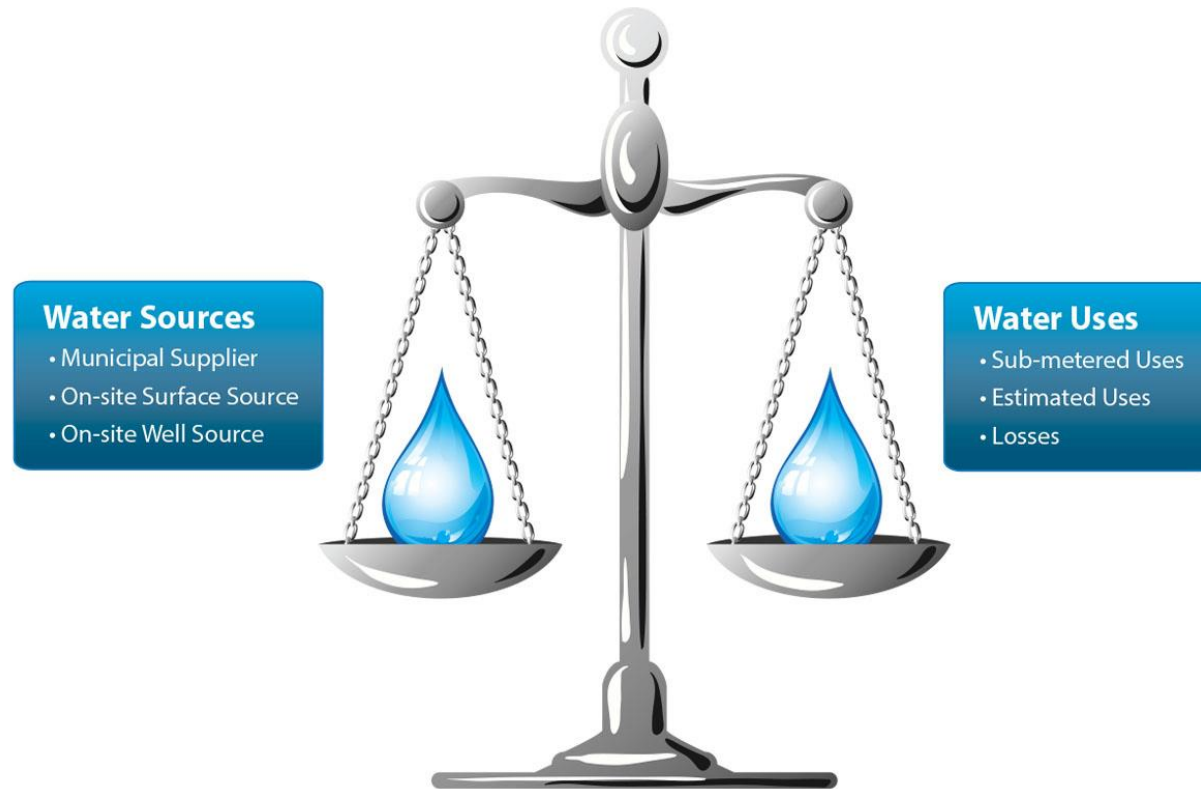
Planning for Federal Sustainability in the Next Decade

- Install water meters
 - Large water processes > 1,000 gallons per day
 - Irrigated areas > 25,000 square feet
 - All buildings > 1,000 gallons per day

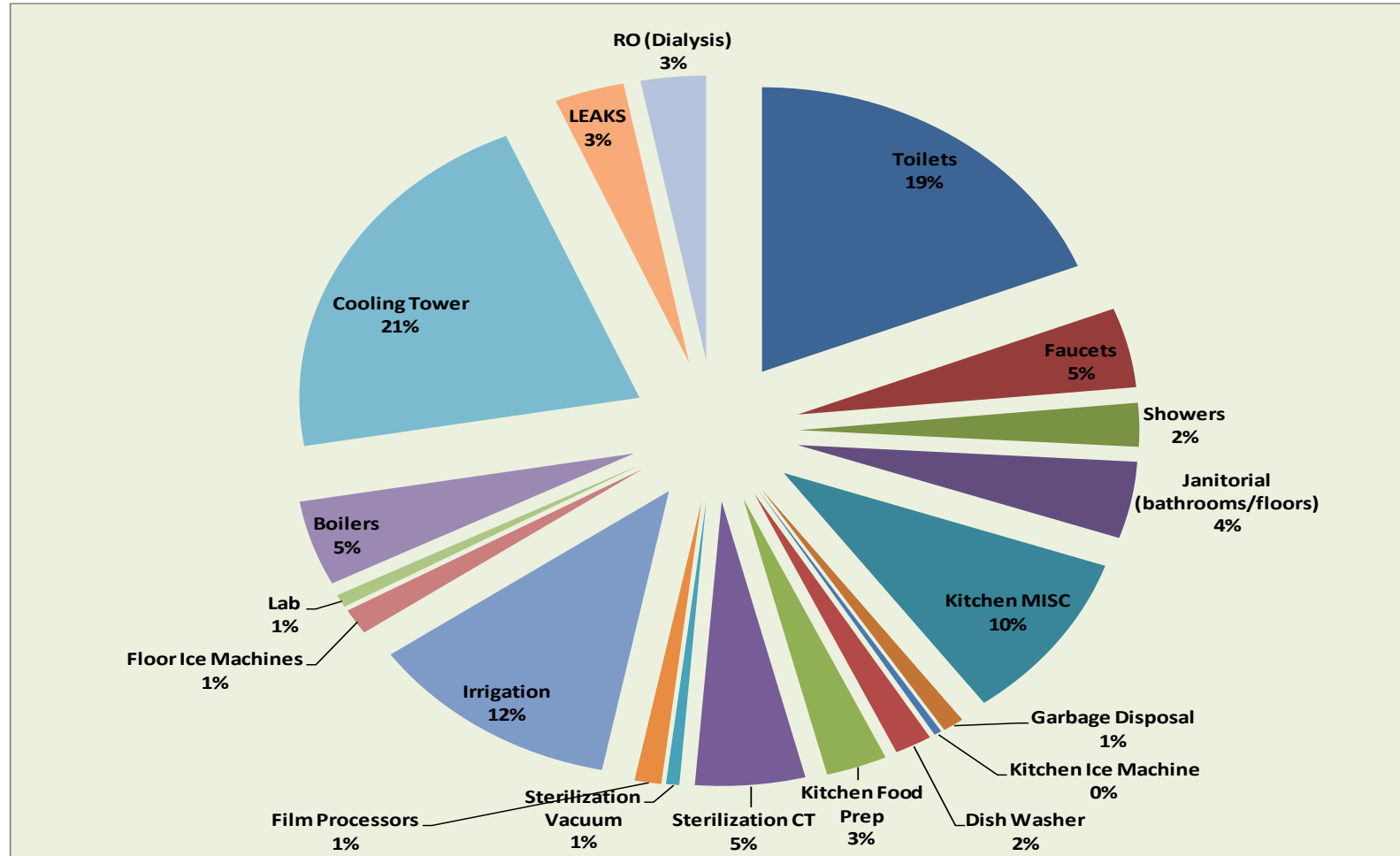
EO 13693 Water Provisions

Planning for Federal Sustainability in the Next Decade

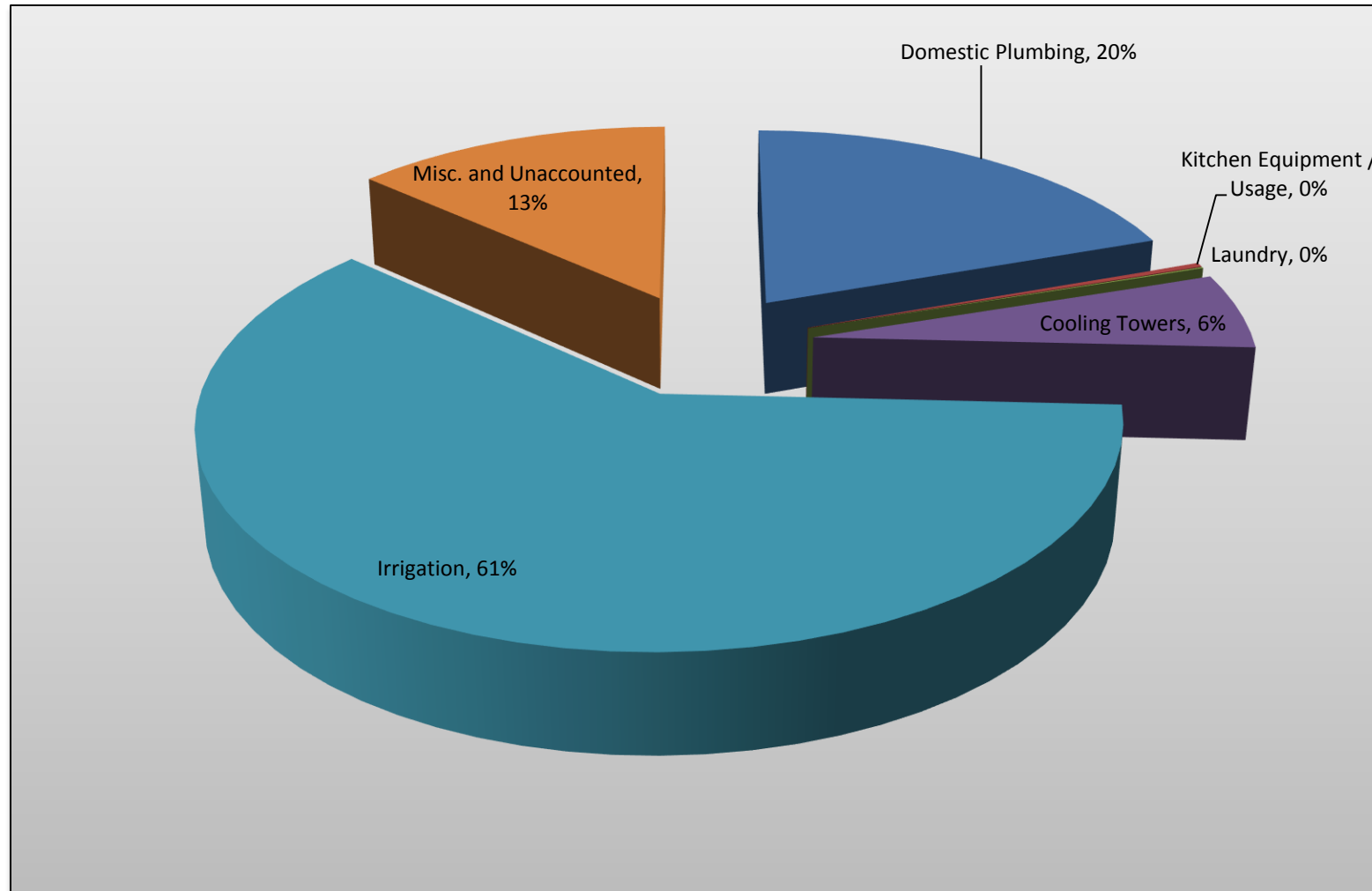
- Develop a water balance



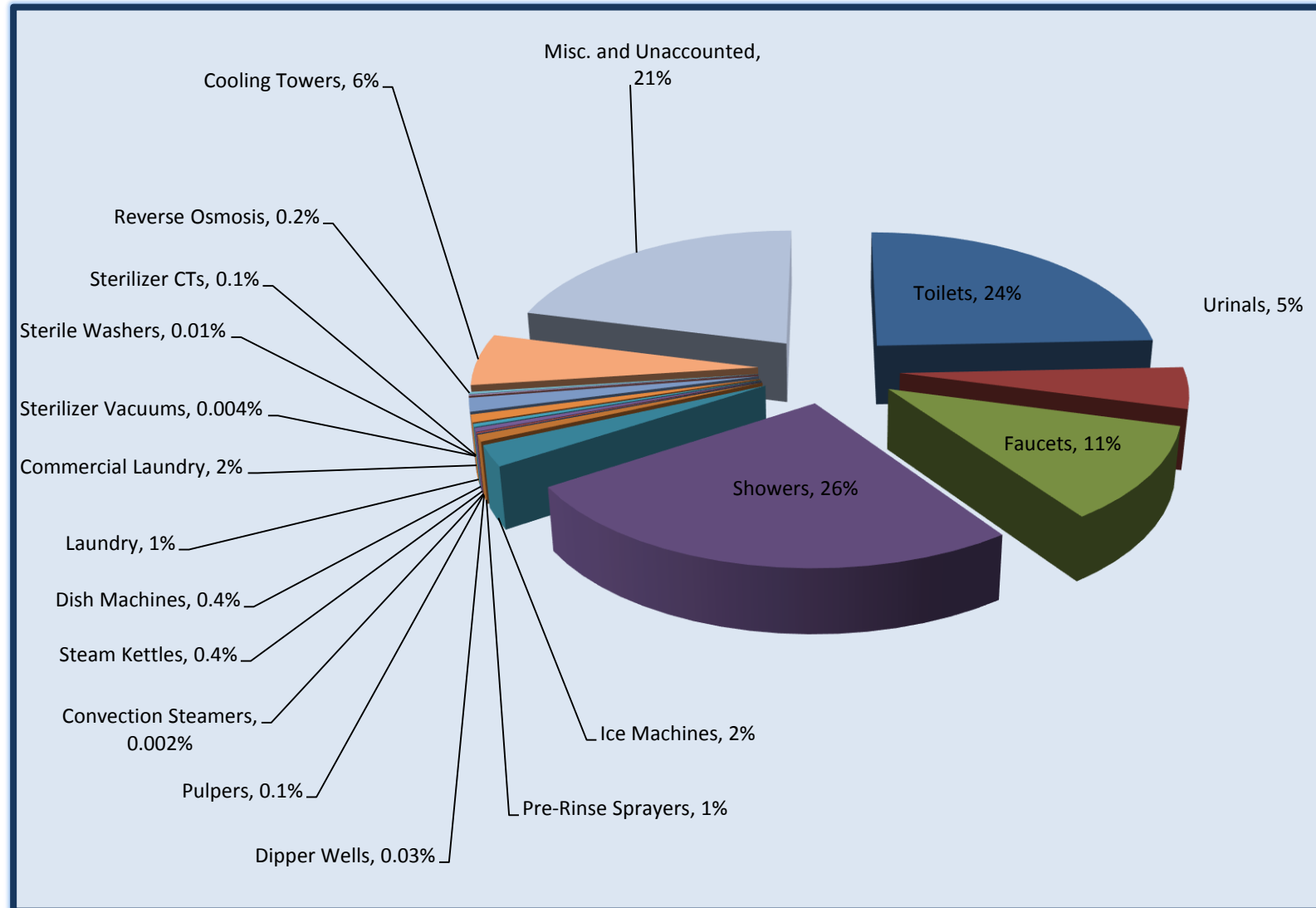
Water Balances Can Look VERY Different



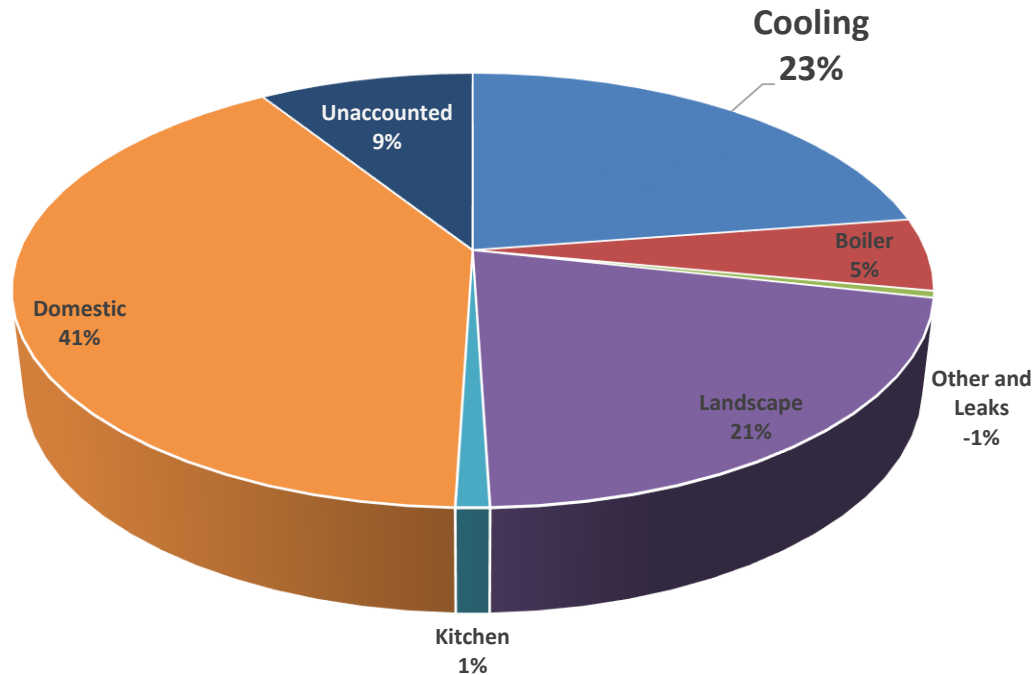
Sports Stadium Water Balance



Hospital Water Balance



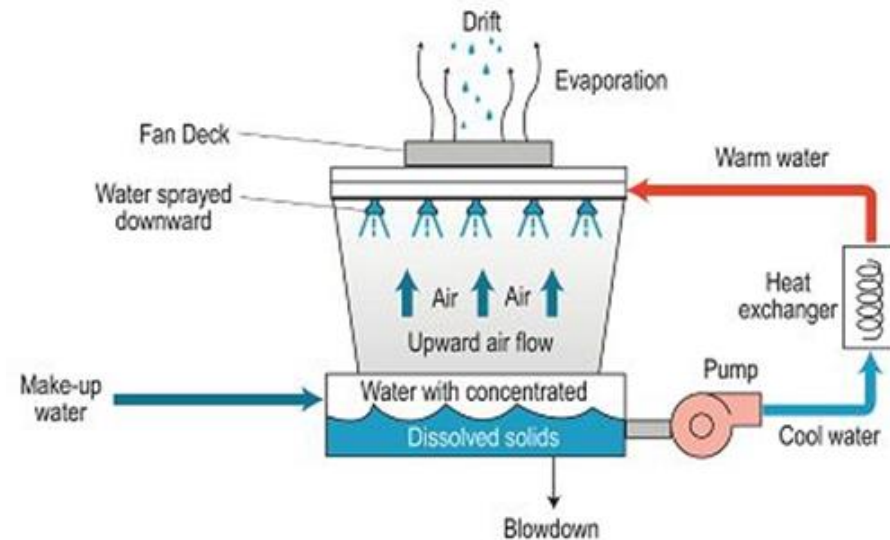
Cooling Water in Federal Facilities Represents a Great Savings Opportunity



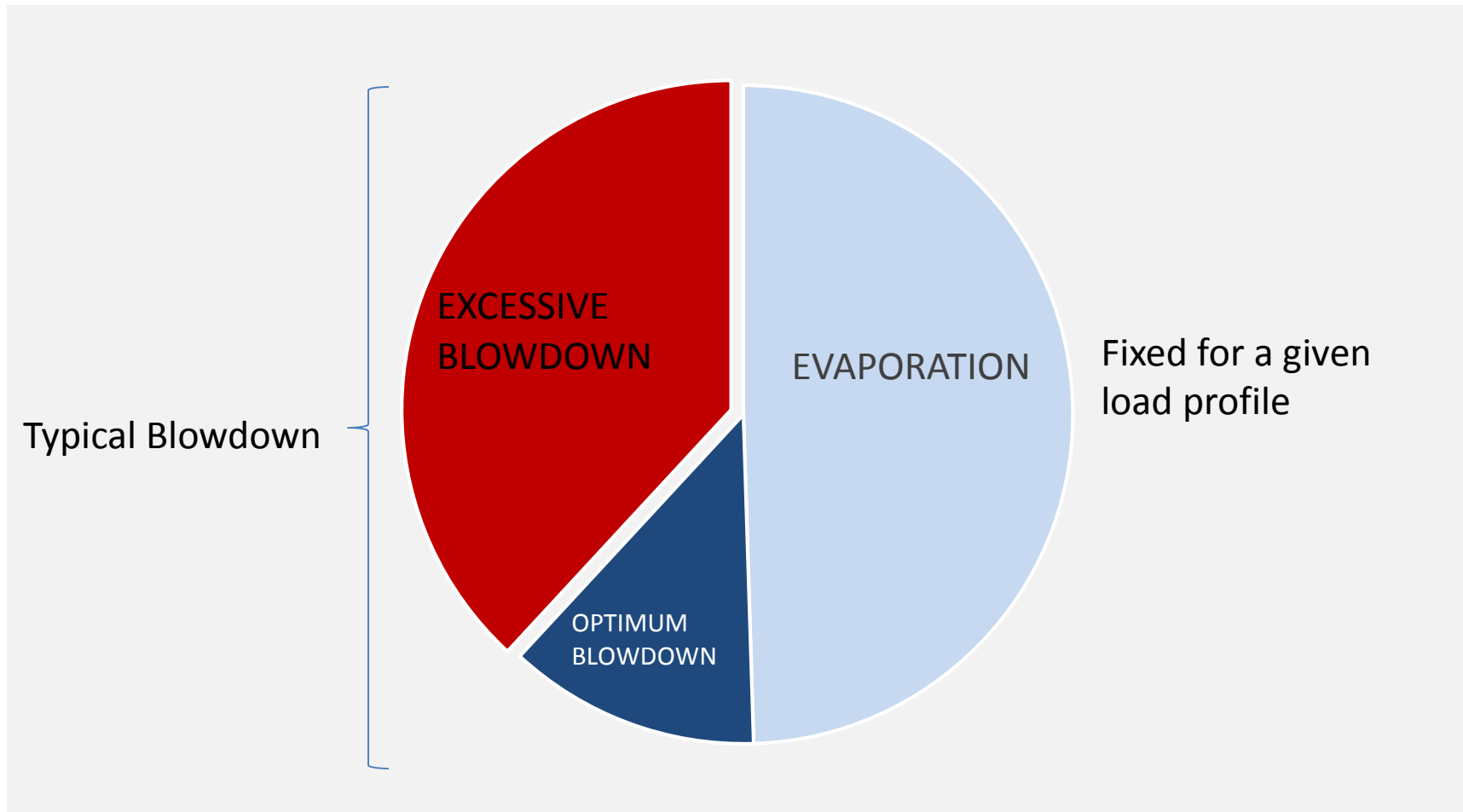
- Government facilities use more than 125 billion gallons per year
- Cooling water accounts for more than 28 billion gallons

The Concept of Excess Water

- In a perfect system, only evaporated water would be consumed
- Blowdown is needed to limit mineral concentration.



Breakdown of the 28 Billion Gallons



Key Savings Strategies



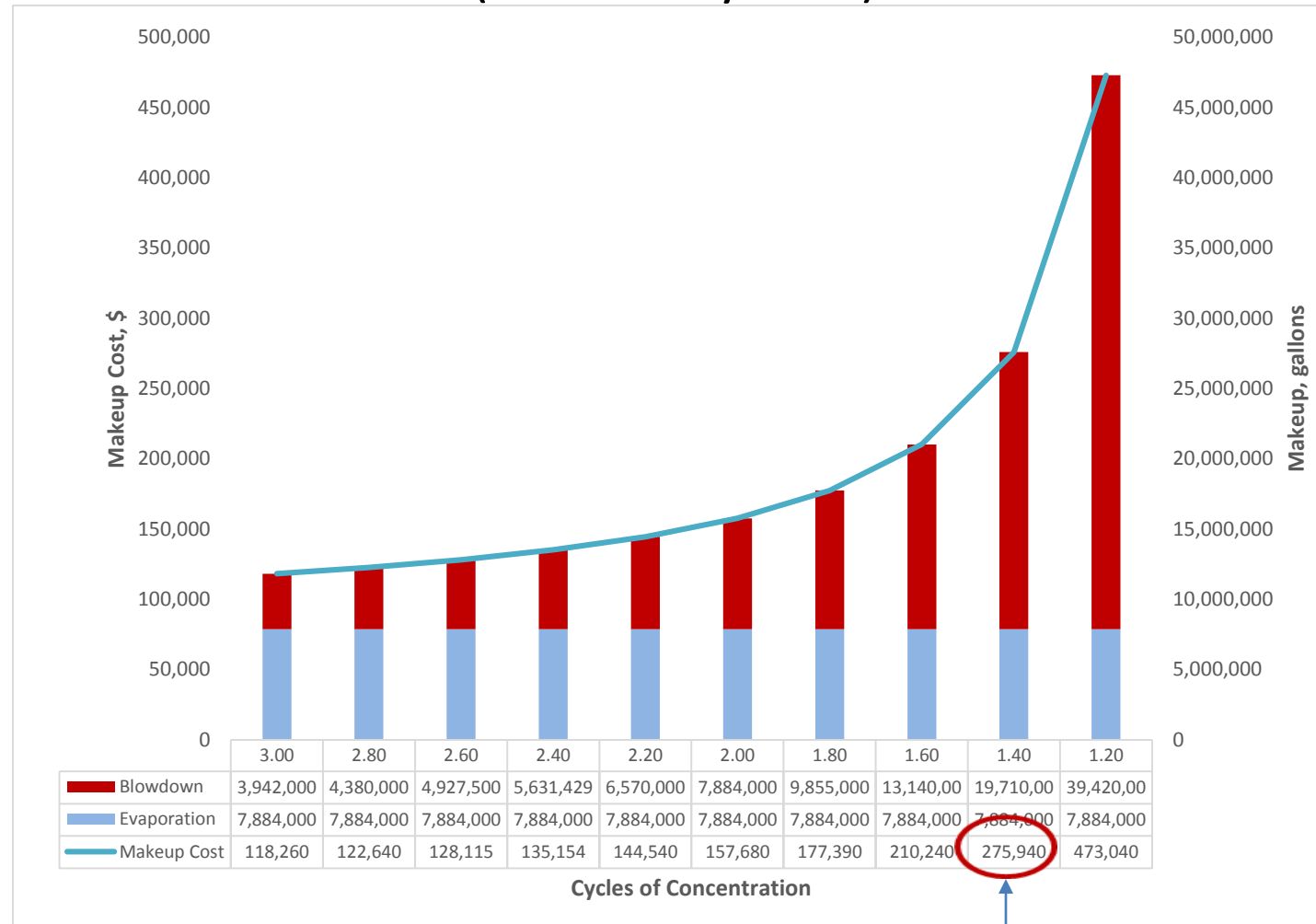
Minimize Losses: Overflow and Leaks

Optimize Blowdown

Alternative Makeup Sources

The Cost of Water Losses

(500 Ton System)

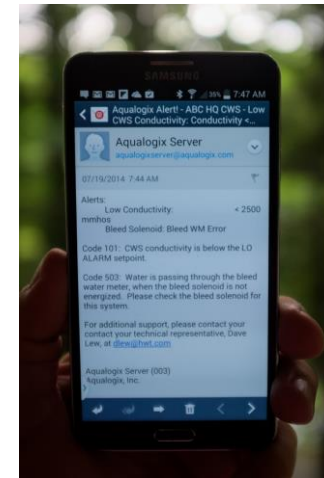


Over \$5,000 per week!

Remote Monitoring:

Identifying Issues Quickly Saves Water and Money

- Typical CWS are checked weekly ... or monthly!
- Significant water loss can go undetected
- Continuous remote monitoring every 5 seconds, with email and SMS text messaging



Key Savings Strategies



Minimize Losses: Overflow and Leaks

Optimize Blowdown

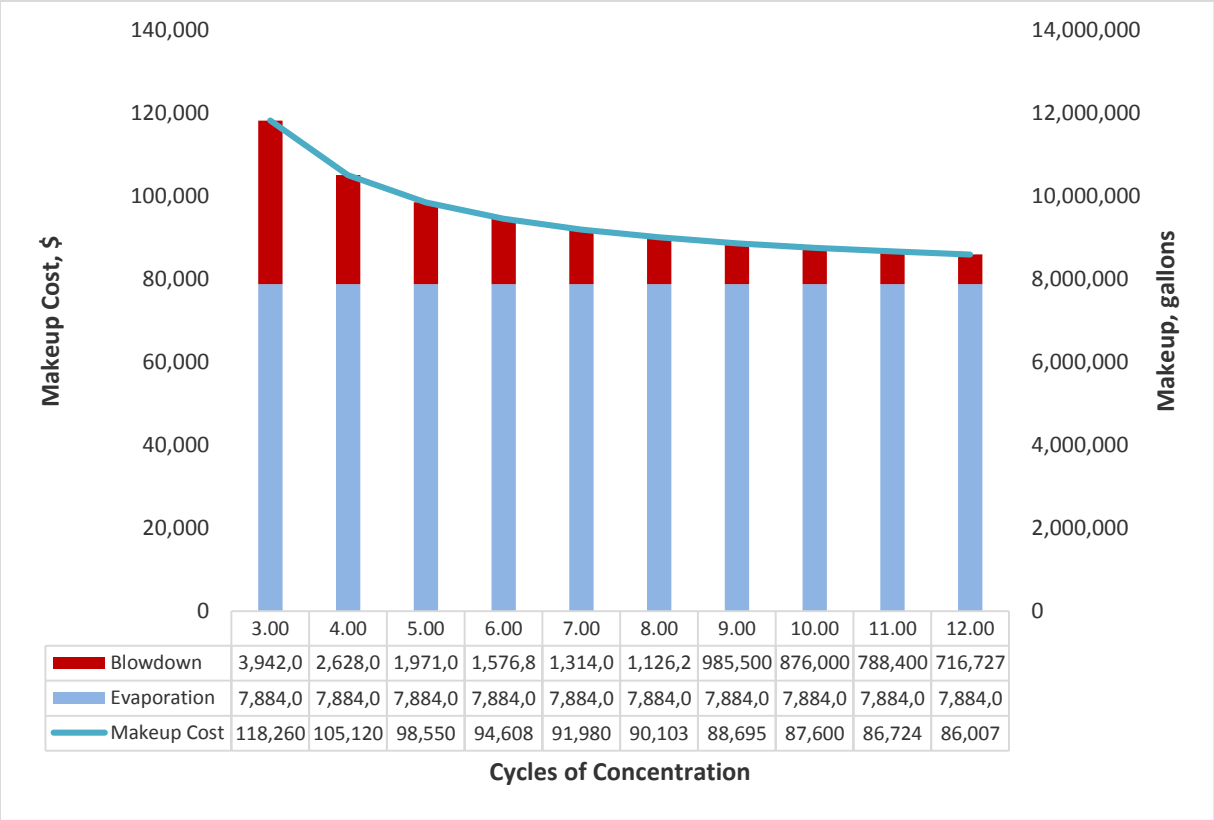
Alternative Makeup Sources

Water Savings from Reduced Blowdown

(500 Ton System)

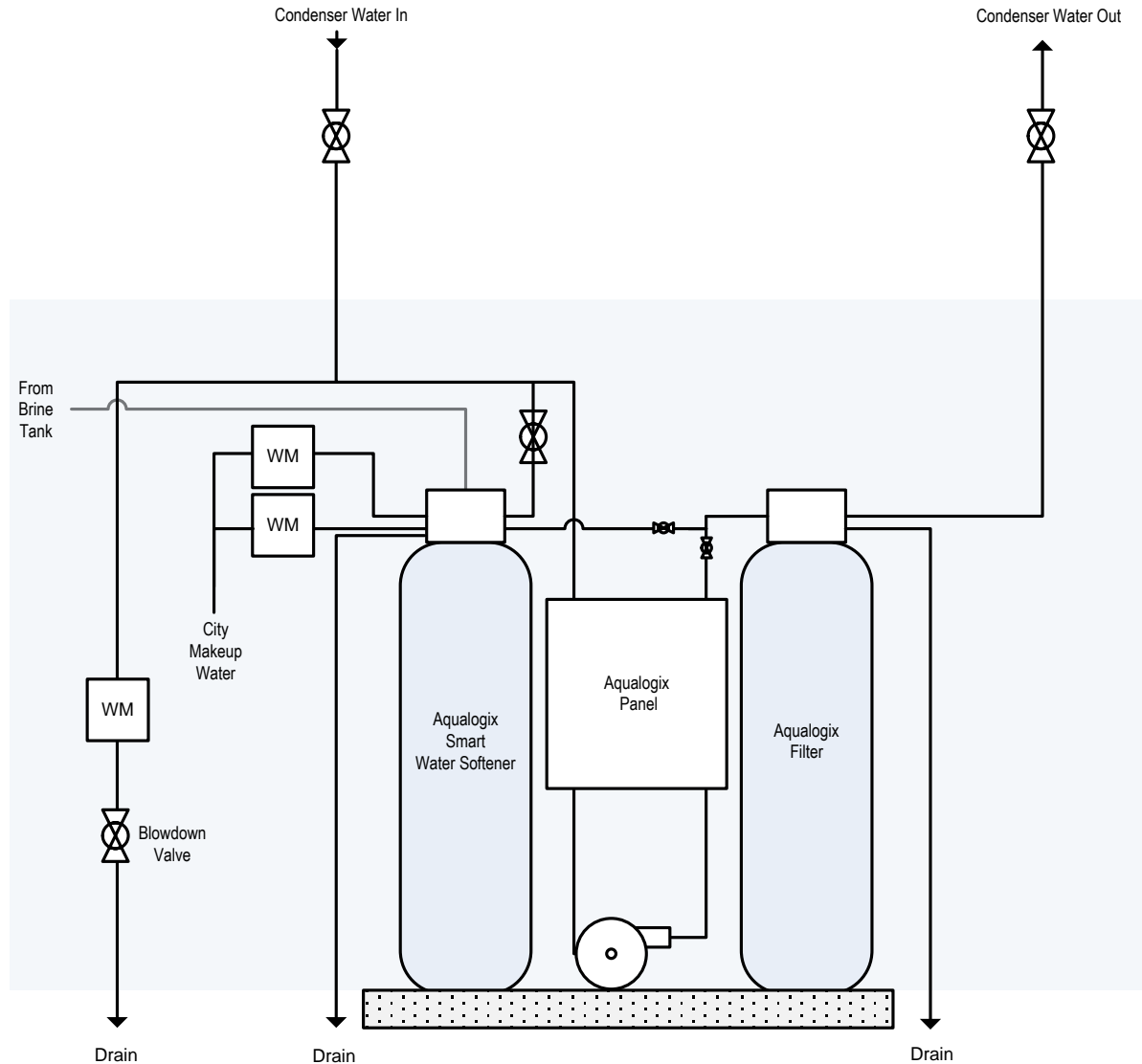
Reducing
blowdown
saves:

- Over 3MM gallons annually
- over \$32,000 annually



Water Savings System

Partial Softening



- Patent-pending design
- Partial removal of hardness allows higher cycles – at same CWS hardness
- Skid-mounted
- Optional design for partial-demineralization

Key Savings Strategies



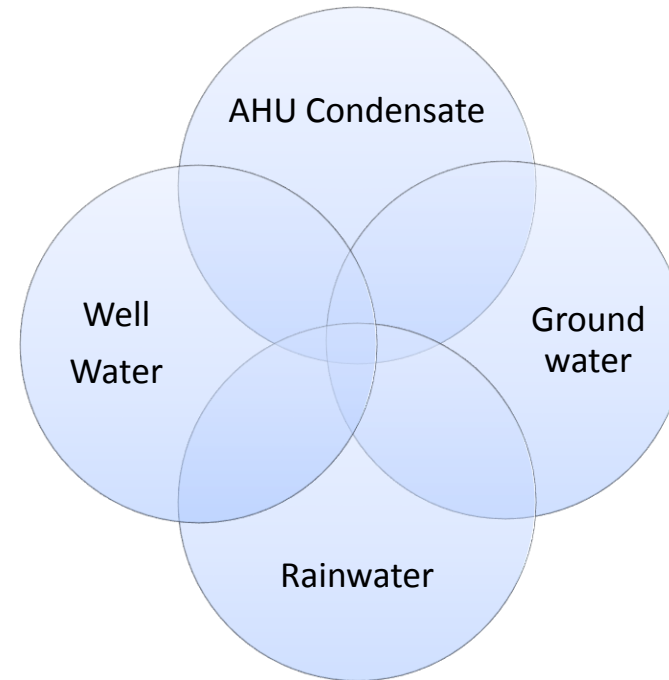
Minimize Losses: Overflow and Leaks

Optimize Blowdown

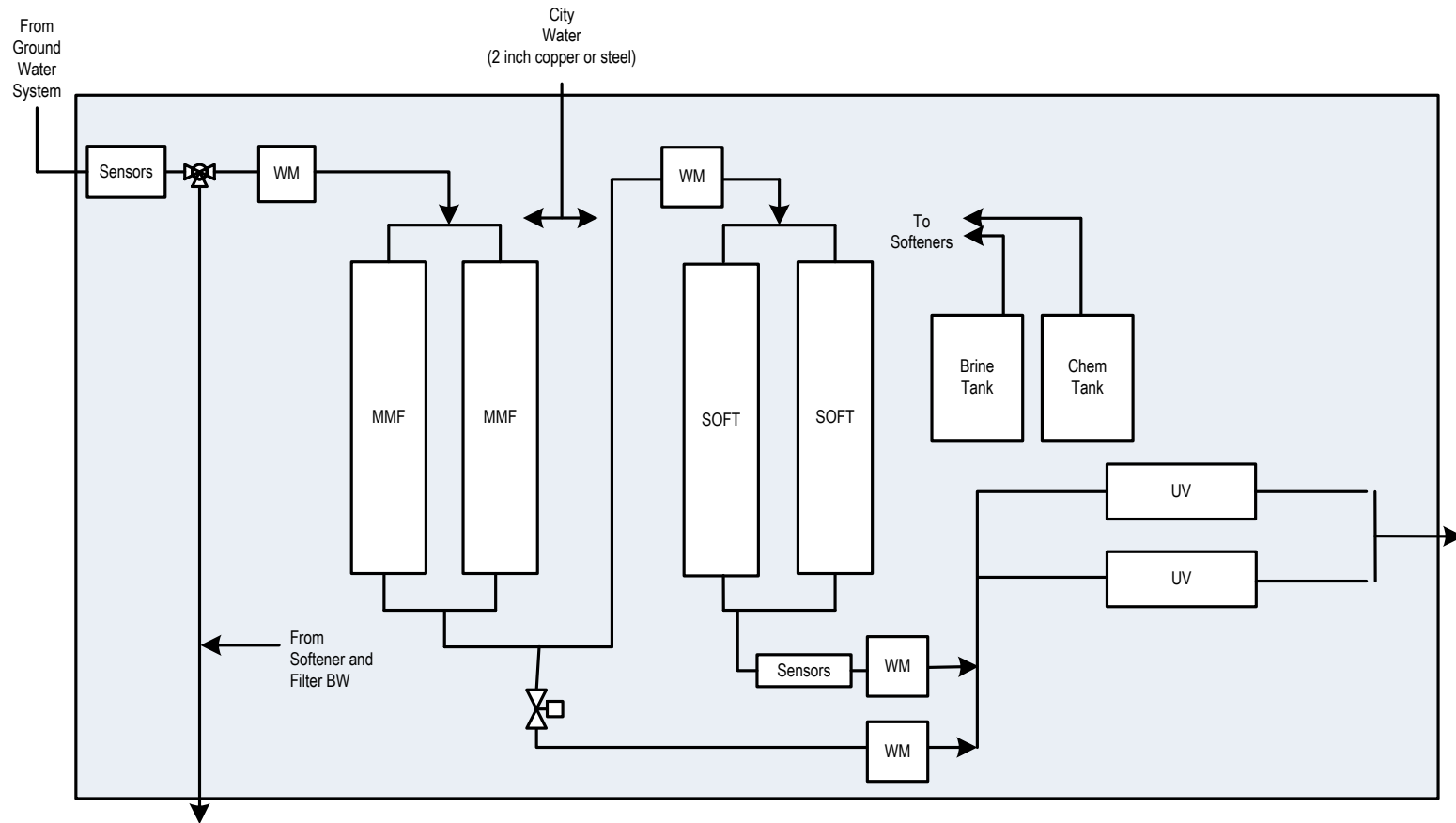
Alternative Makeup Sources

Alternative Makeup Sources

- Low cost water source
- Variable quality
- Variable availability
- Control Issues

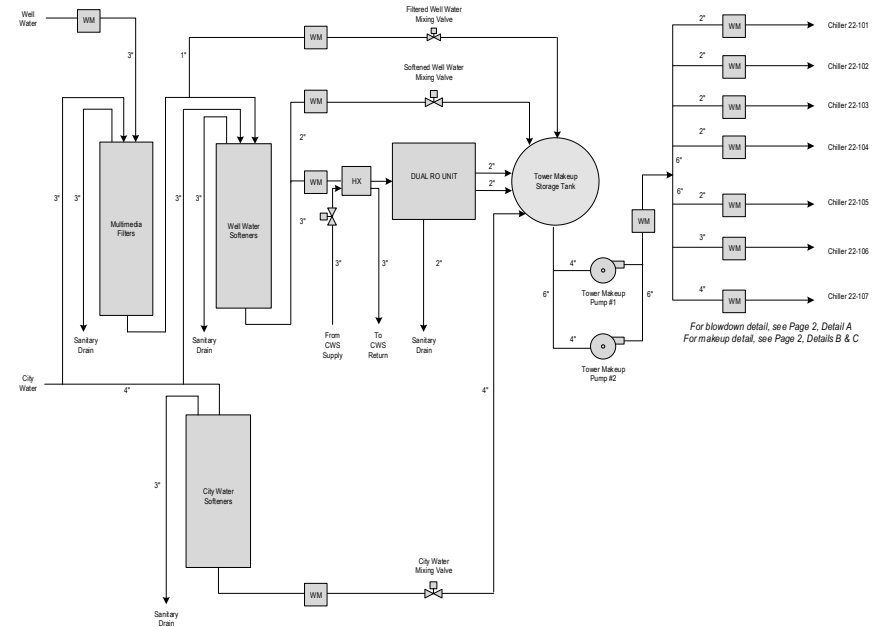


Water Savings System Groundwater Reuse



Water Savings System Supplemental Well Water

Annual	
Ton-hours	30,000,000
Average Tons	3,400
City Water Savings	\$246,000
Sewer Savings	\$99,000
Offset Costs	\$20, 500
Net Savings	\$324,500



Conclusions

- Cooling system represent a great opportunity for water savings.
- Remote monitoring saves water and money by identifying excessive water use quickly.
- Alternative water sources can be a good savings option.
- Optimization enables even greater savings and more consistent control.

Questions?