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Let's Solve Water

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Tomorrow's Water Today: Xylem's Advanced Solutions for Water Reuse

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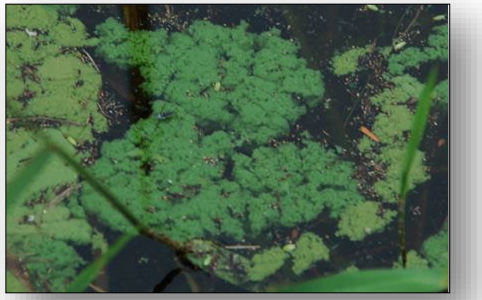
Treatment Challenges & Drivers for Water Reuse

Safety & Reliability

Cost



Taste & Odor Toxins

Compliance

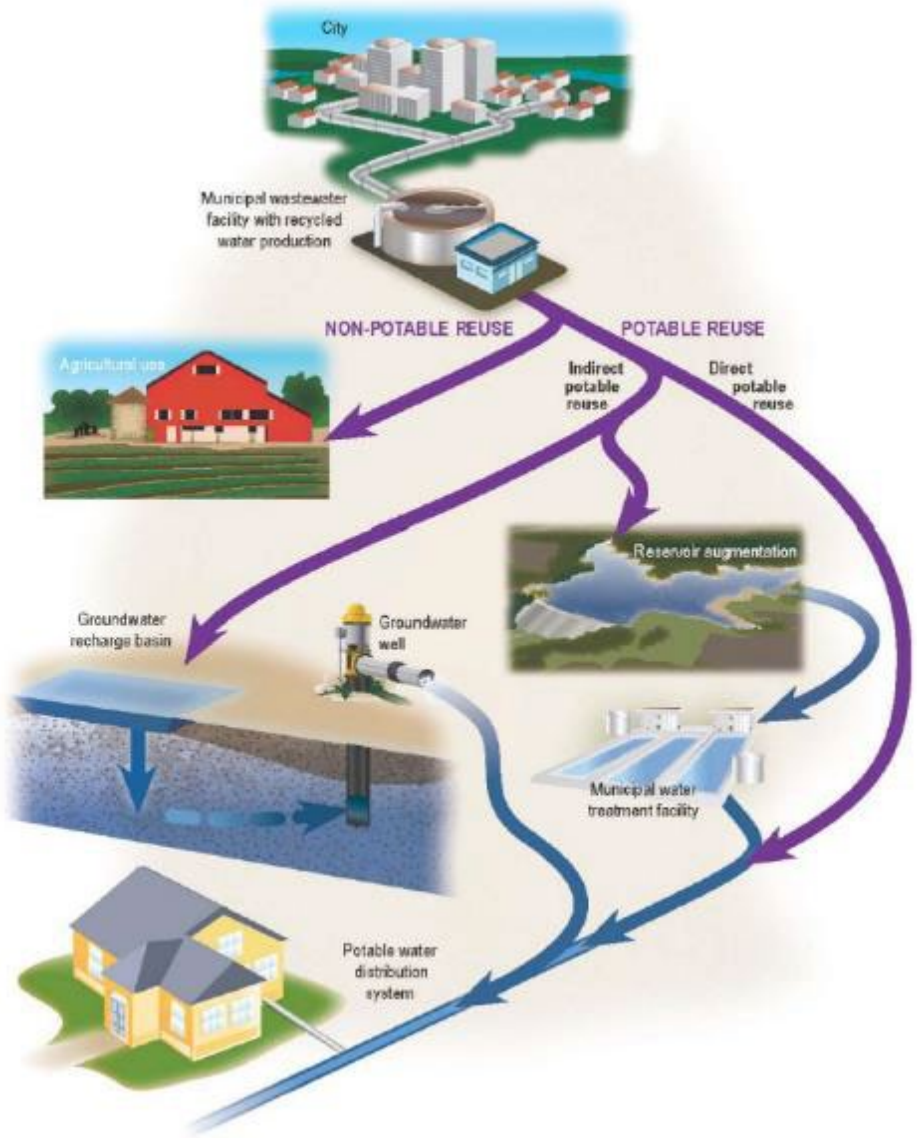
Emerging Contaminants

Operation

Water Stress

- Population Growth
- Urbanization
- Climate Change

Forms of Water Reuse



Non-Potable Reuse (NPR)

Indirect Potable Reuse (IPR)

Direct Potable Reuse (DPR)

Source: http://www.water.ca.gov/waterplan/docs/cwpu2013/Final/Vol3_Ch12_Municpal-Recycled-Water.pdf

Xylem: Encompassing the Entire Cycle of Water

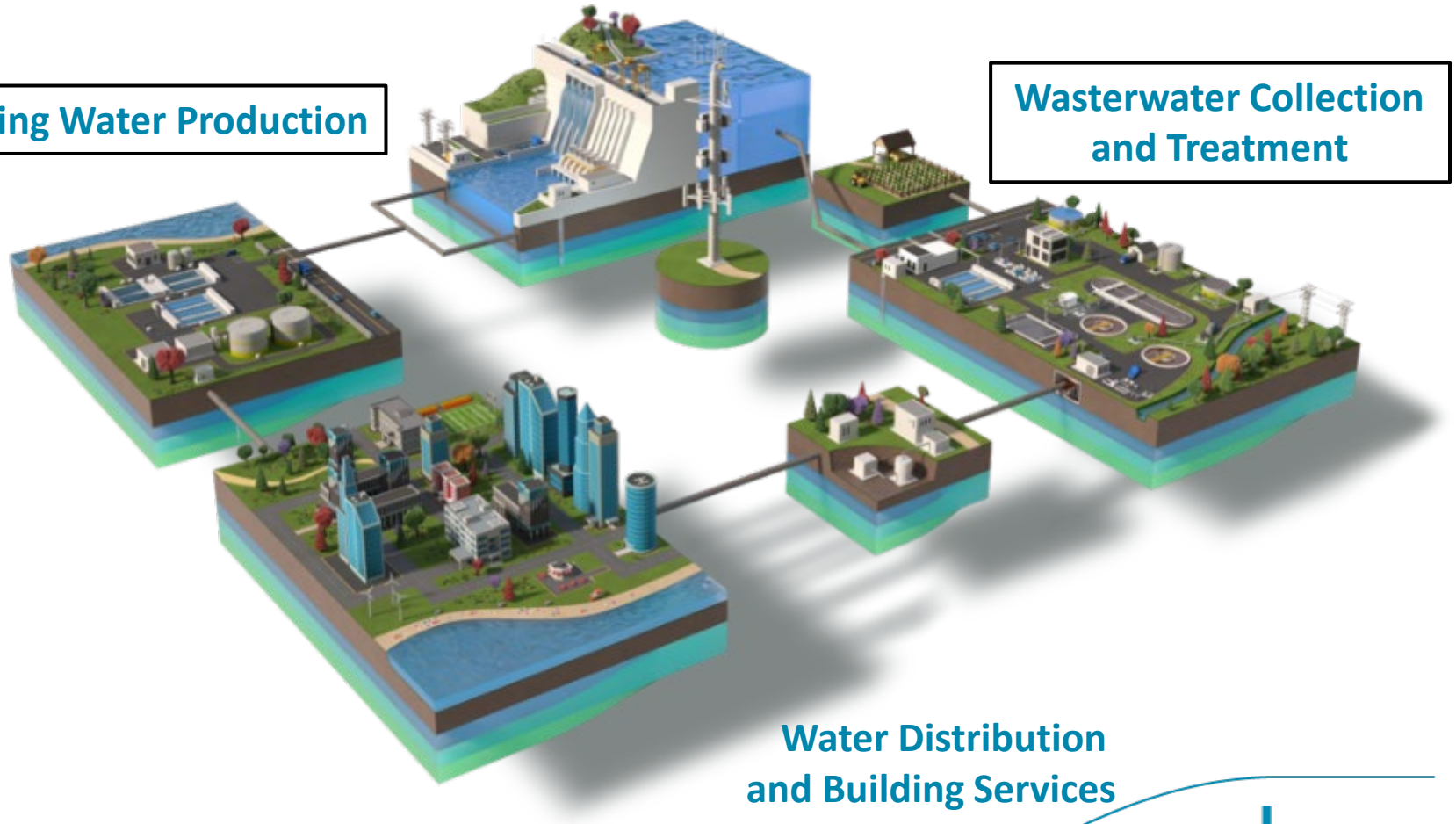
xylem **Treatment**

Provide best-in-class "Inside the Fence" solutions for Municipal Water and Wastewater Treatment

Resource Abstraction and Ecosystem Monitoring

Drinking Water Production

Wasterwater Collection and Treatment



Water Distribution and Building Services

Transport → Treat → Test → Reuse: Enabling & Optimizing Water Use

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Treatment Products and Brands

Biological Treatment and Biosolids

Processes for biologic wastewater treatment to remove nutrients. Aeration equipment and blowers to supplement such processes.

- Diffusers
- Aerators
- Pressure monitor
- ICEAS advanced SBR
- OSCAR

SANITAIRE
a xylem brand

Mixers

Maintain optimal conditions for nutrient removal by mixing basing contents and influent streams

- Adaptive Mixer
- Single Speed Mixer

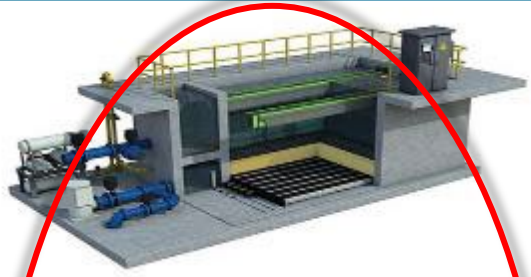
FLYGT
a xylem brand

Disinfection UV and Ozone

UV disinfection eliminates or neutralizes microorganisms.
Ozone eliminates or breaks down organic compounds.

- UV disinfection systems
- Ozone generators
- Oxidation process

WEDECO
a xylem brand



Filtration and Clarification

Filters, biofiltration and denitrification systems that remove particles and suspended solids, organics & CECs and nitrogen.

- Clarifiers
- Filtration
- Sludge collection
- Solids removal
- Denitrification
- Engineered filter media

LEOPOLD
a xylem brand

sensus SonTek YSI godwin Bell & Gossett GOULDS WATER TECHNOLOGY

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Open Channel UV Systems

- Duron open channel UV system, used for NPR applications
- Efficient & adaptable design to suit flow, treatment goals, and hydraulics
- Easy installation, maintenance, and service
  - Automatic cleaning system & lifting mechanism

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Closed Vessel UV Systems

- LBX & Spektron UV Systems are ideal for reuse applications
- Optimized hydraulics and irradiation
- Variable design & control to treat different effluents, goals
- Automatic dosing & cleaning system

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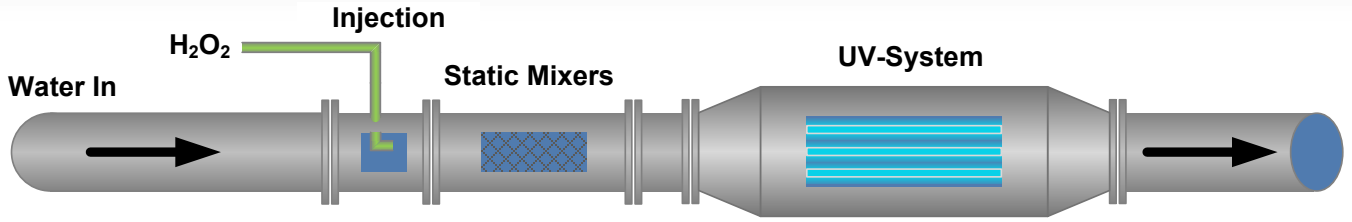
AOP Systems



- Advanced Oxidation Process generate hydroxyl radicals that destroy CECs
- Some compounds are not strippable, absorbable or biodegradable.
  - Some are regulated or are candidates for future regulations
- Typically, at the end of an advanced treatment train

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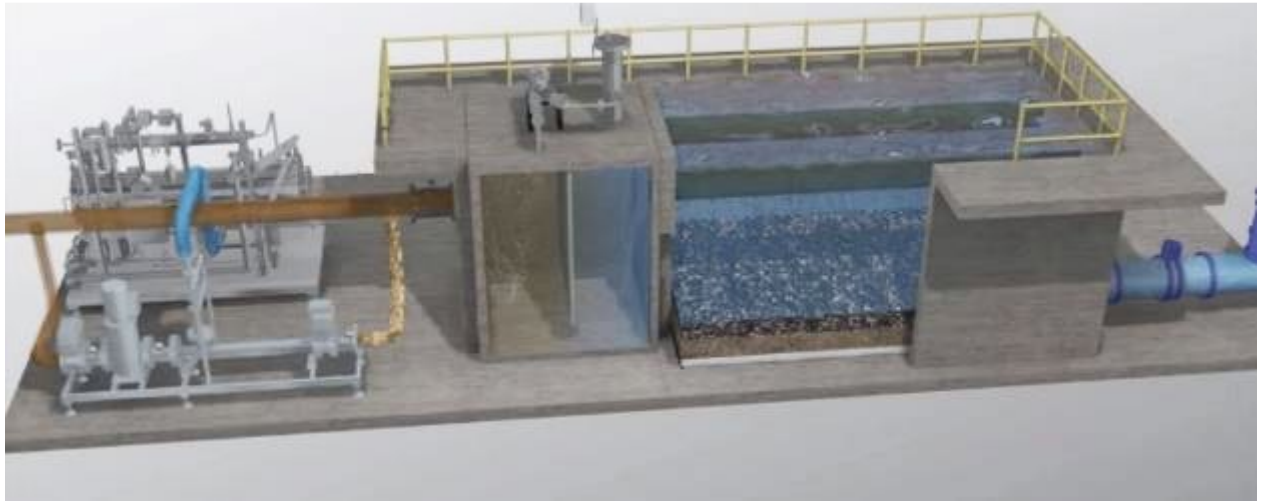
Ozone Systems

- Very powerful oxidizing agent
  - Oxidation: Color, taste & odor, particle removal, algae control
  - Disinfection: Giardia, Crypto, Viruses
- Great stand-alone or part of advanced treatment train

Ozone + BAF Solution

1. Oxidation
2. Filtration & Biological Treatment
3. Sensors and Integrated Process Control



❶ Inactivation of Pathogens & Oxidation of Organics

❷ Removal of TSS and Turbidity

❸ Destruction/Removal of TOC, CECs, and DBPs

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Oxelia Ozone + BAF System

- Ozone-Biological Aerated Filter (BAF) system with integrated on-line analytical and advanced control
- Better effluent quality control to achieve:
  - Reliable CEC & DBP removal and control
  - More consistent TOC limit
  - Pathogen log reduction credit
- Lower operational cost by reducing ozone dose, power usage, and backwash frequency

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Conclusions

Water Reuse is essential to **address** the current and future **potable water challenges**

Advanced Water Treatment will help **improve water quality** and is essential to further **reduce costs** of water reuse

There is **no one reuse train fits** all approach, every scenario had their own driver, limitations and requirements.

Public Outreach, Piloting and Regulations will help further drive and **elevate the water reuse market**

THANK YOU

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