



TrueSND using Disc Aerator Technologies by Envirex An Evoqua Water Technologies brand

Presented by: Freddy Kade, M.S., P.E.

POST CHANGE OVERVIEW

Date: April 8, 2015

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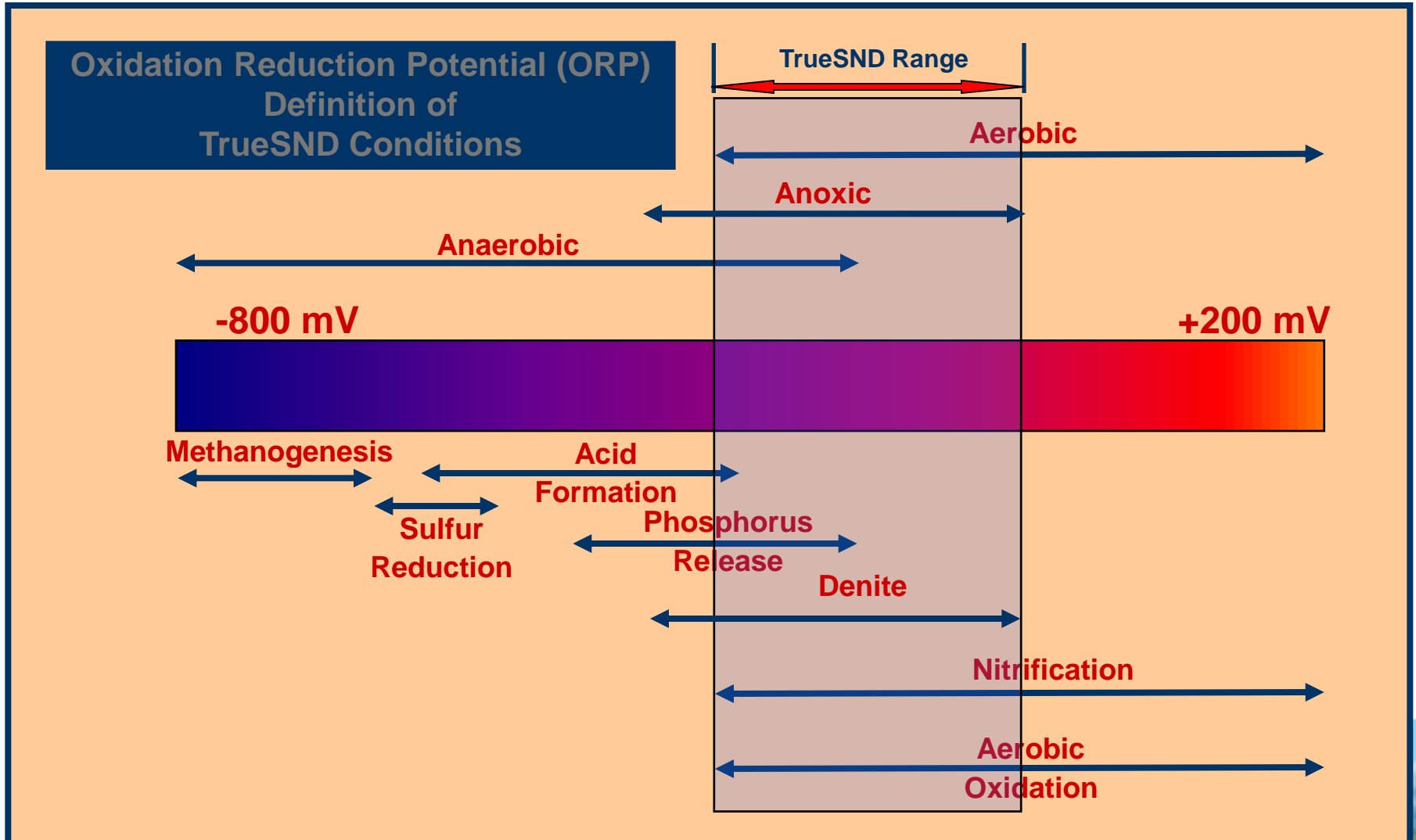
- Became EWT in 2013.....formerly known as US Filter, Siemens, Veolia
- Experience
 - 100 yrs in water industry
 - 50 yrs biological experience
- Well known brands.....Envirex, JetTech, Memcor, RJ Environmental, Davco...



USFilter

TRUE SND BASICS

What is True SND??

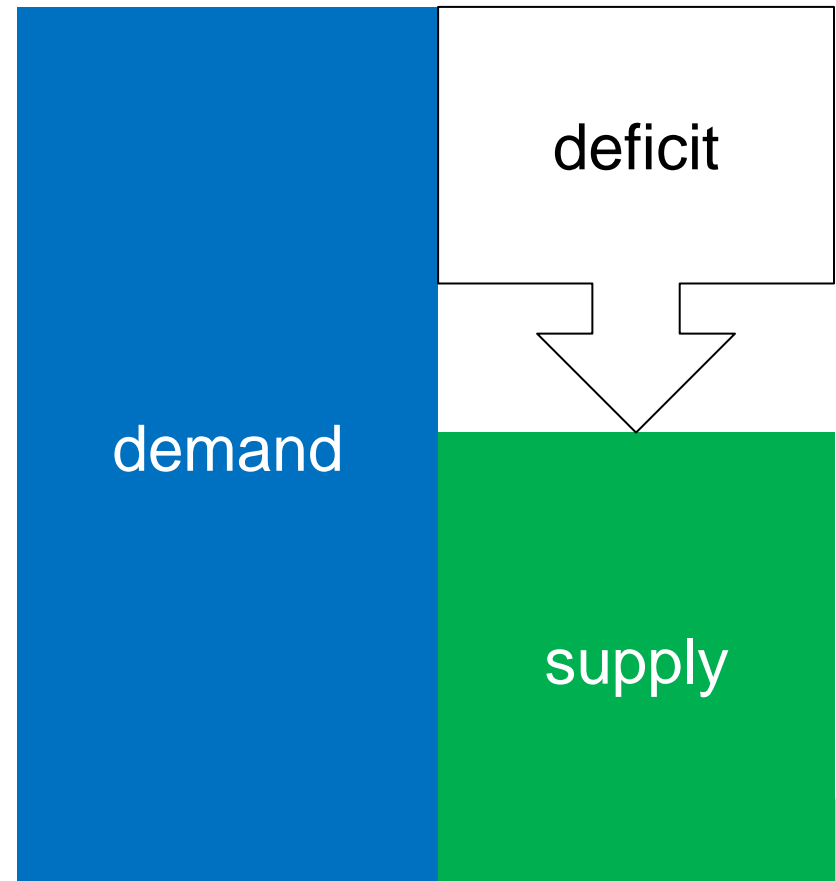


True Simultaneous Nitrification/Denitrification (TrueSND)

TrueSND Benefits

- Improved nitrogen removal
- Improved oxygen transfer
- Reduced process volume for BNR
- Reduced mechanical equipment for pumping or mixing

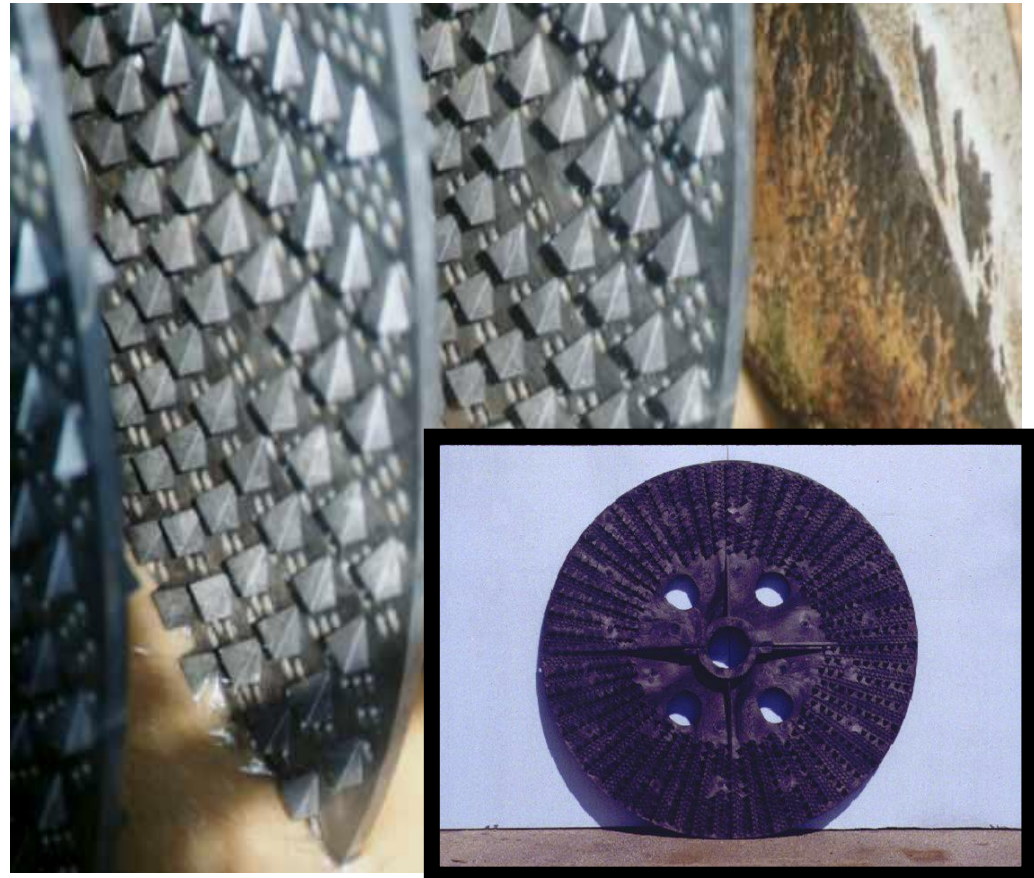
TrueSND Theory



Disc Aerators

- **Superior oxygen transfer efficiency**
- **Exceptional power turn down capability**

Vary rotational speed
Vary immersion
Turn on/off



Disc Aerator Technologies

Orbal



VLR



VertiCel



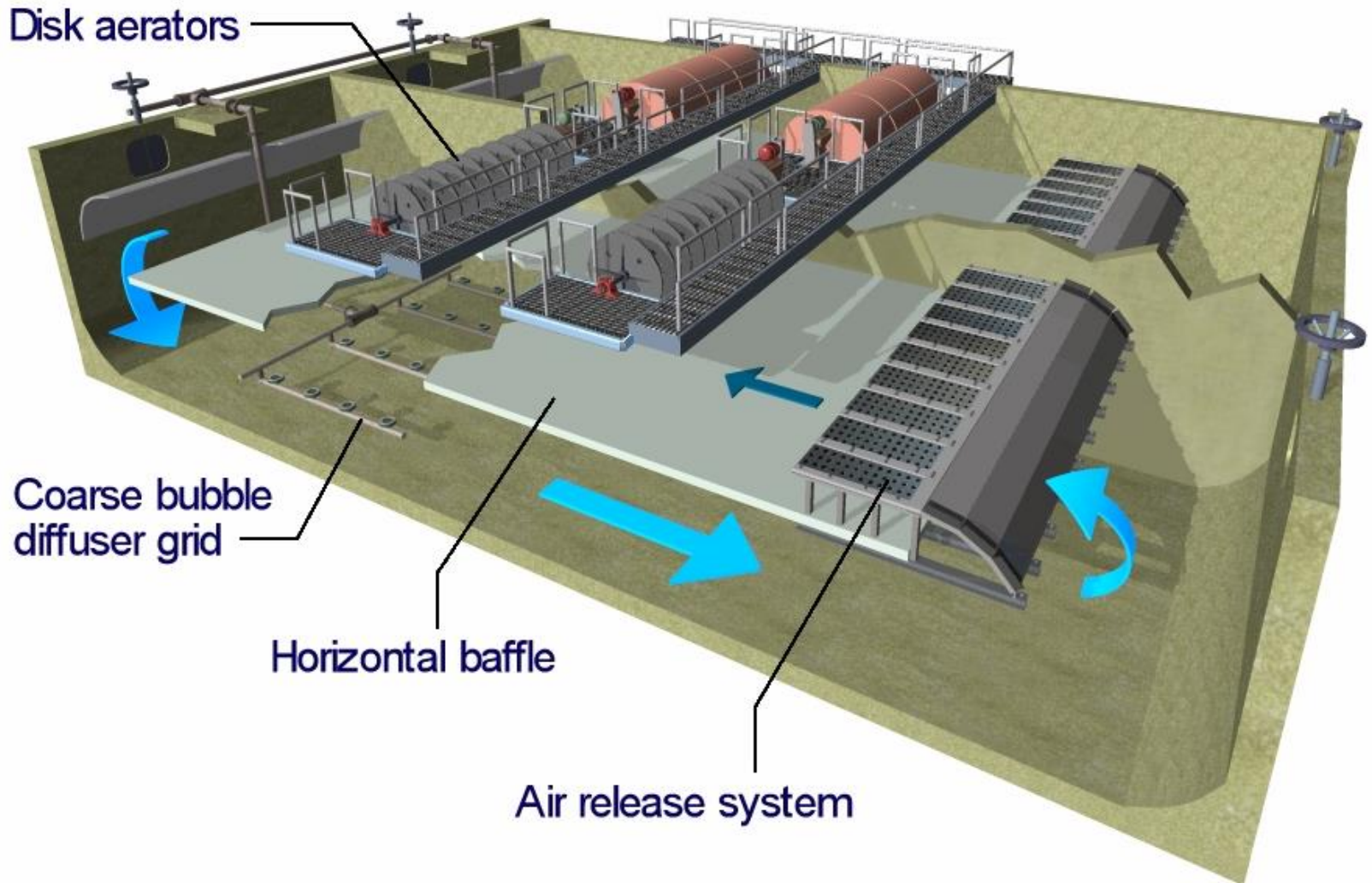
When and why do I use Orbal?

Orbal typically used for small to midsize plants

- Typical Flow 0.1 MGD - 3 MGD
 - » Smallest Orbal 0.03 MGD
 - » Largest Orbal is 26 MGD
- Typical loading rate 15 - 25 lbs/1000 ft³/day
- Typical SRT 10 - 25 days
- Blowers are not required
- Orbal systems have the best mixing efficiency and the best turndown



Vertical Loop Reactor (VLR) BNR Process



VLR Tanks Under Construction



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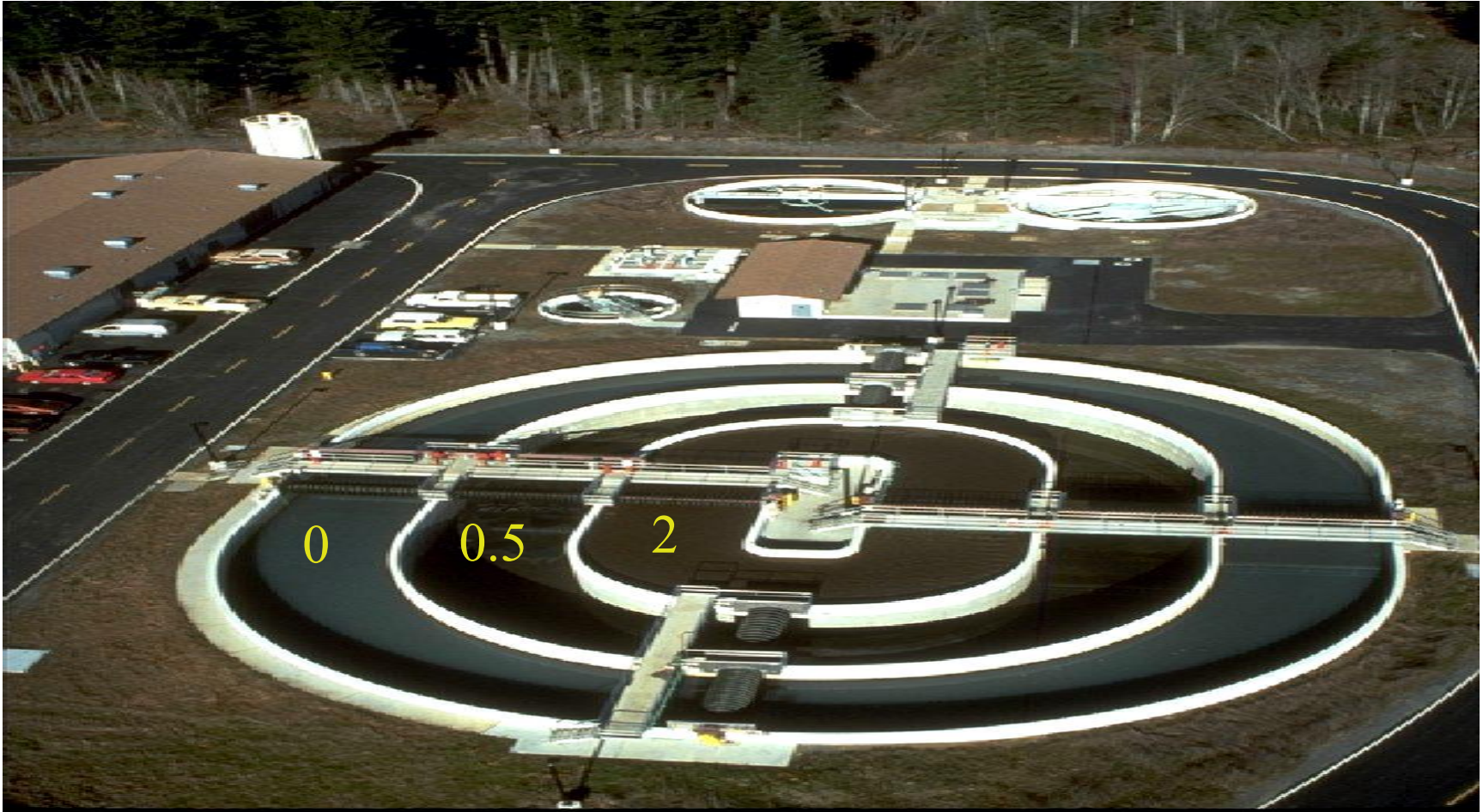


When and why do I use VLR?

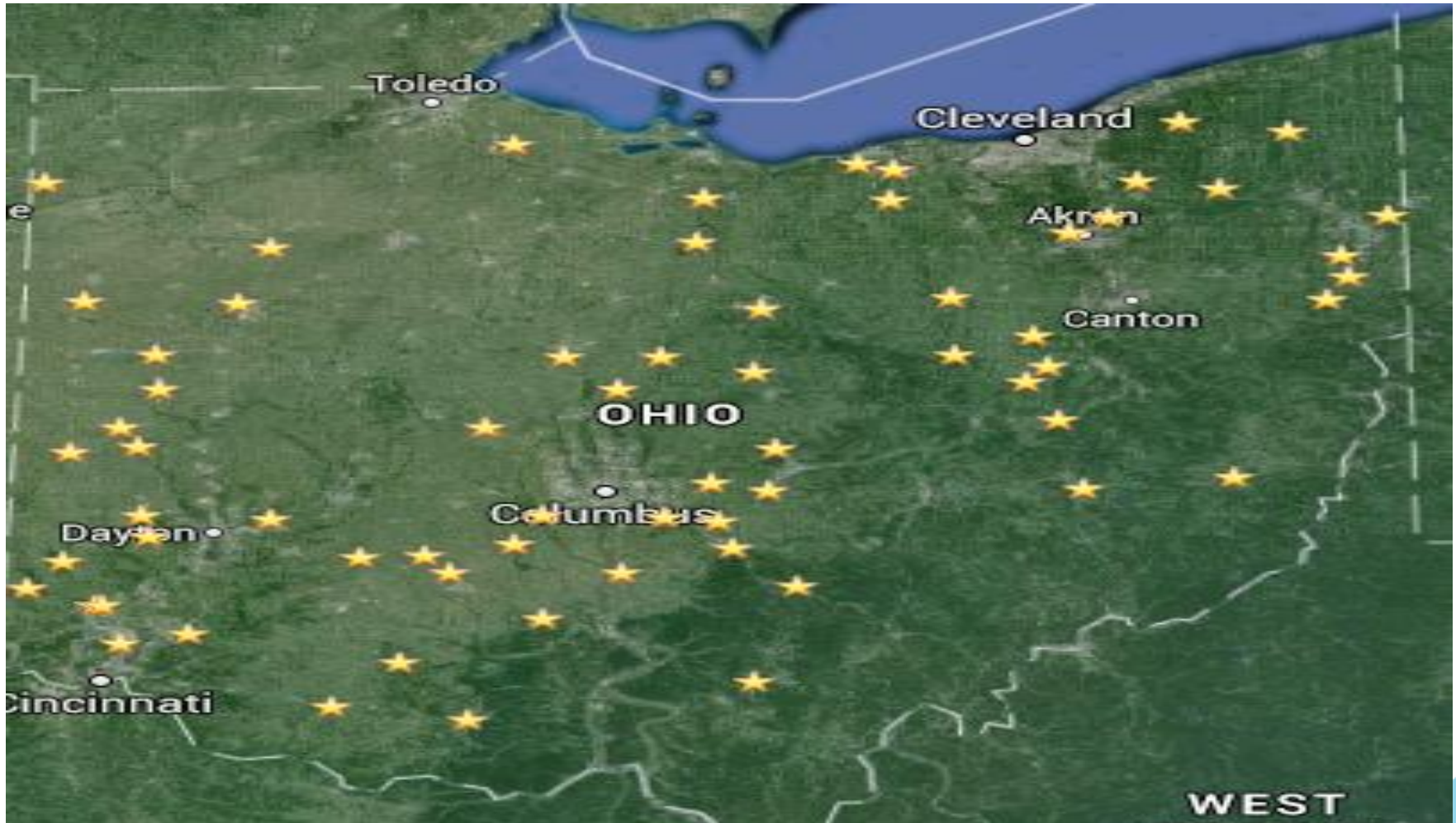
VLR is usually used for midsize to large plants

- Typical Flow 2 MGD - 10 MGD
 - » Smallest VLR 0.22 MGD
 - » Largest VLR 41.5 MGD
- Typical loading rate 20 – 30 lbs/1000 ft³/day
- Typical SRT 8-20 days
- Deeper tanks equals smaller footprint (21ft – 23 ft)
- Each VLR tank has independent disc aerators
- Disc aerators are small (25 hp or less)
- Two sources of oxygen delivery (disc aeration & coarse bubble)
- Coarse bubble air adds flexibility

DO Profile in Orbal



Ohio Orbal and VLR installations



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TRUE SND VALUE

Advantages: Redundancy

- Aeration redundancy
- Reactor redundancy
- Storm flow management



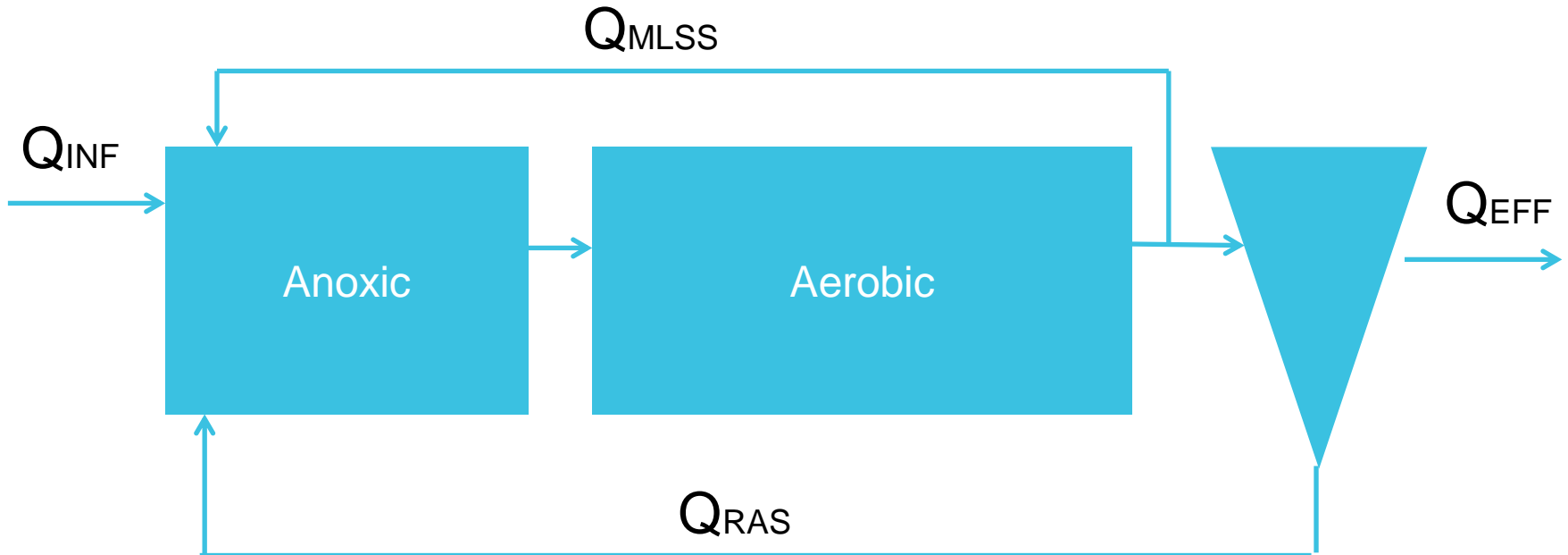
Advantages: Energy Efficiency

- Exceptional turn down capability
- True SND & oxygen transfer at low DO
- 20-30% higher energy efficiency in comparison with other horizontal mechanical aerators



SND COMPARISON

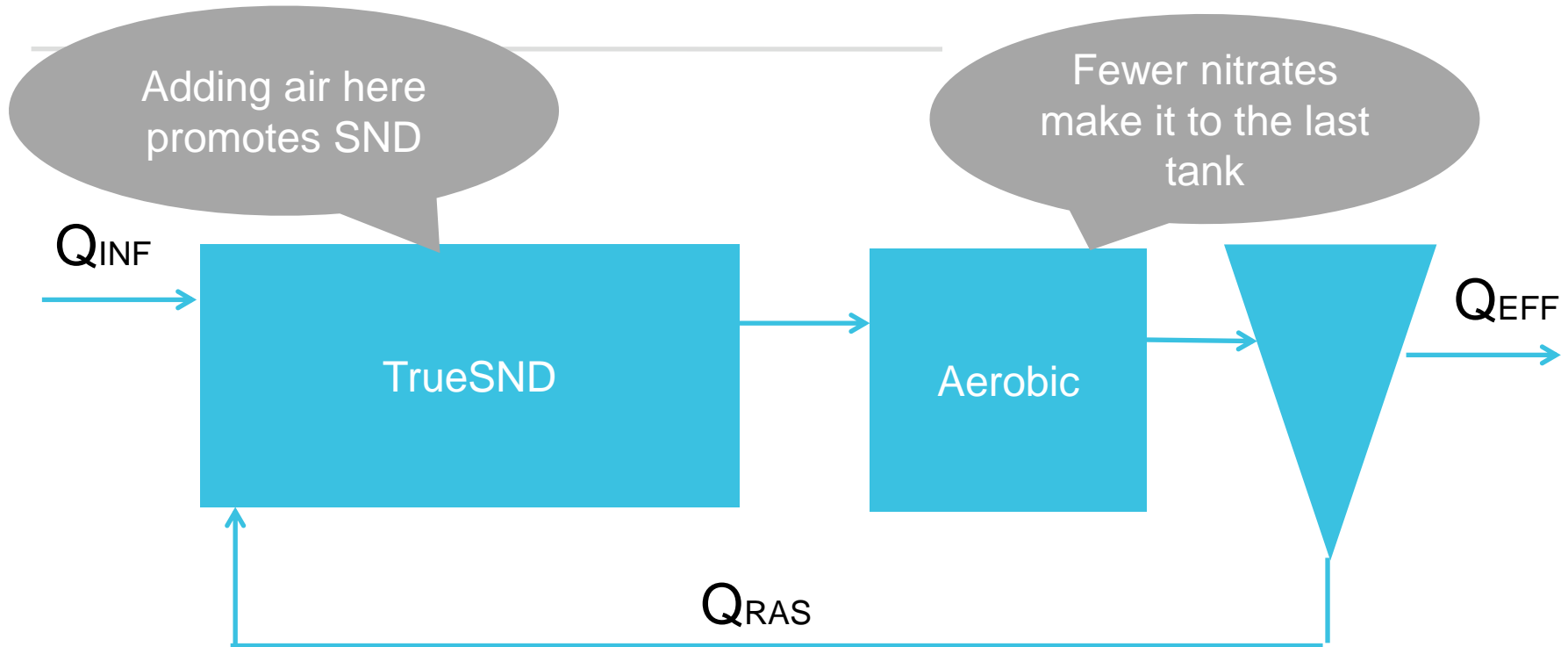
Nitrogen Removal Basics – MLE Process



- Large Volume
- Additional Tankage
- Additional Mixer (s)
- Additional 2Q-4Q IR recycle pumps



True SND Nitrogen Removal



- Reduced volume
- No need for additional tanks
- No need for dedicated mixers
- No need for IR pumps



Less Pumping and Mixing Required for Total Nitrogen Removal

TrueSND

- 75% denite
- RAS = 1Q

TrueSND W/ IR

- 87% denite
- RAS = 1Q

MLE

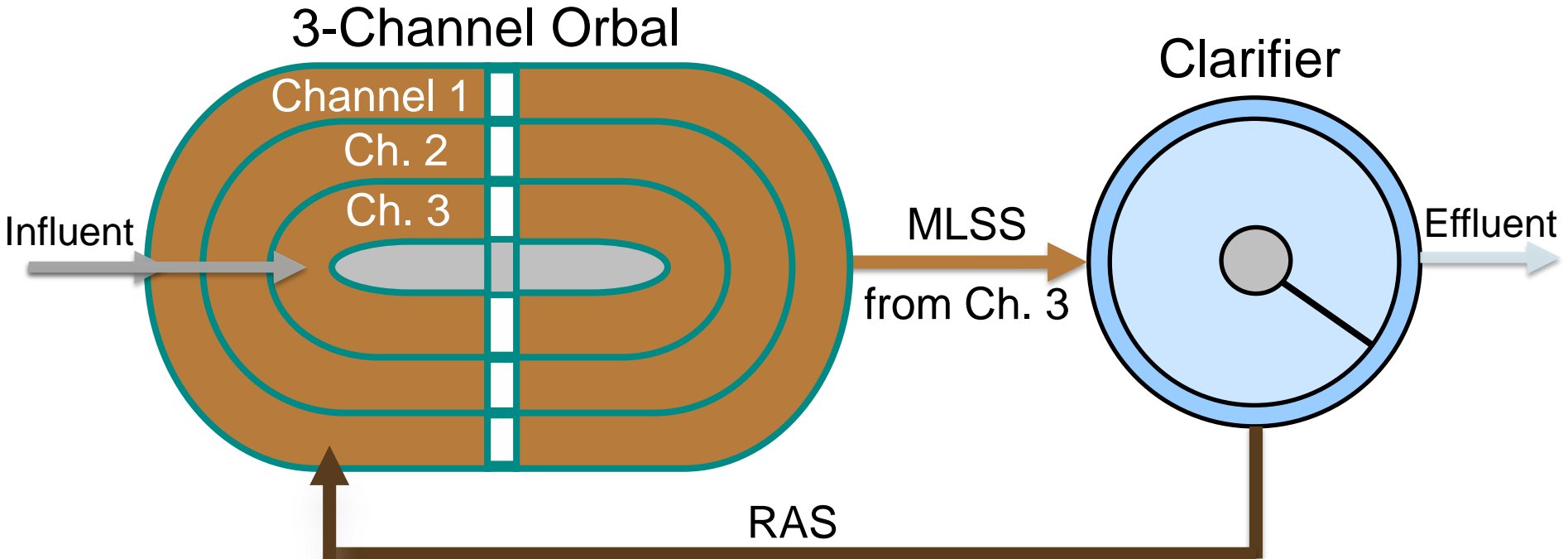
- 75% denite
- RAS = 1Q

- MLSS recycle = 0
- MLSS recycle = 2Q
- Mixing Energy = 0
- Mixing Energy = 0
- Reduced Volume
- Reduced Volume

- MLSS recycle = 2Q
- Mixing energy = 40 hp / Mil gal
- Large Volume

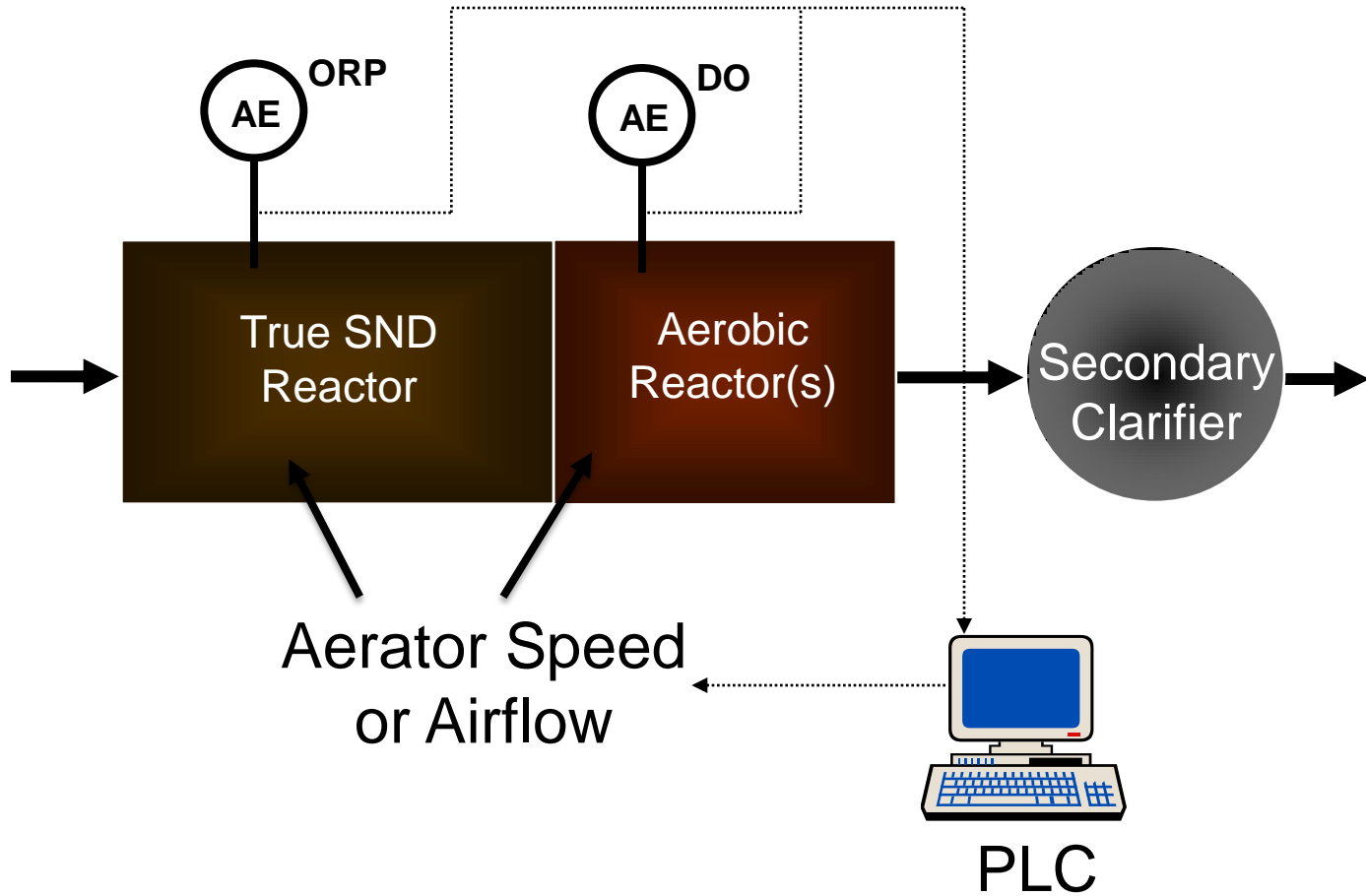
OPERATION MODE

ORBAL PROCESS: StormFlow Mode –



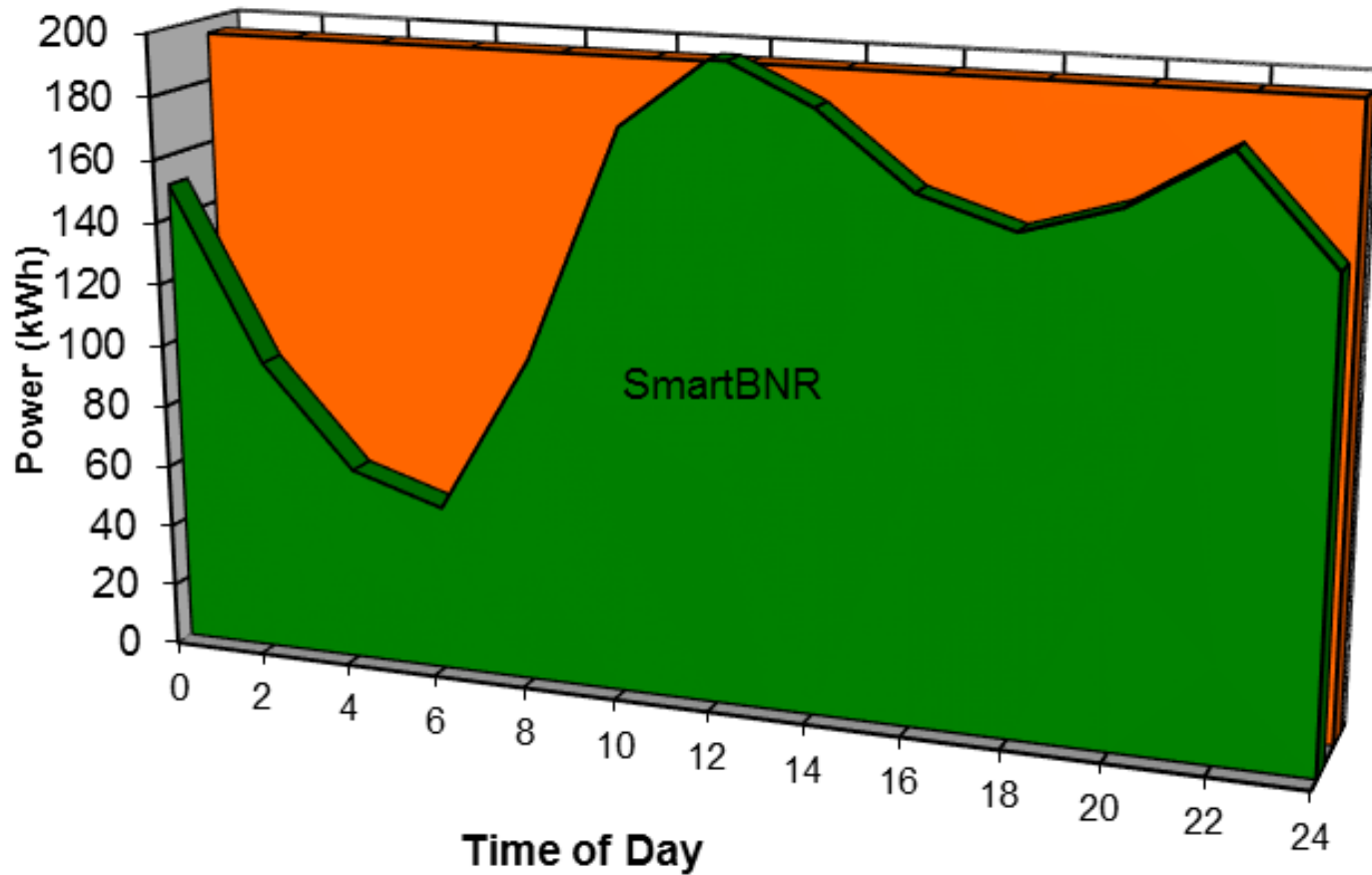
StormFlow Mode: RAS in Channel 1, Influent in Channel 3
Normal Operation: RAS + Influent into Channel 1

SmartBNR – Aeration Control



Smart BNR – Operating Cost Savings

kWh w/ Typical Diurnal Flow Pattern



TrueSND with Disc Technologies

- Proven process with over 800 installations around the globe
- Exceptional turn down capability
- Reduced basin volume and energy consumption
- Can meet any effluent requirements
- Simplistic operation and maintenance





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WATER TECHNOLOGIES

THANK YOU FOR
YOUR ATTENTION

Contact Information:
Freddy Kade, M.S., P.E.
Fred.kade@evoqua.com
Phone: 262-422-7129

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