

# Engineering a Flexible High Performance Industrial Wastewater Treatment Facility

A Case Study of a Leading Chocolate Manufacturer Wastewater Treatment Project



# Agenda

**About Veolia Water Technologies**

**Common Drivers for Industrial Pretreatment**

**Project Background**

**Wastewater**

**Facility Virtual Tour**

Key Technology Highlights

**System Performance Results**

**Q&A**



# About Veolia Water Technologies







# FOOD & BEVERAGE WASTEWATER CAPABILITIES

Veolia Water Technologies is world class at solving wastewater challenges by engineering and installing reliable treatment processes that meet the environmental and business objectives of our customers.

**35+** Years of Industry Experience

**150+** North American Industrial Wastewater References

**100%** Committed to Ensuring a Successful Project





# Providing Wastewater Treatment Solutions for Leading Companies

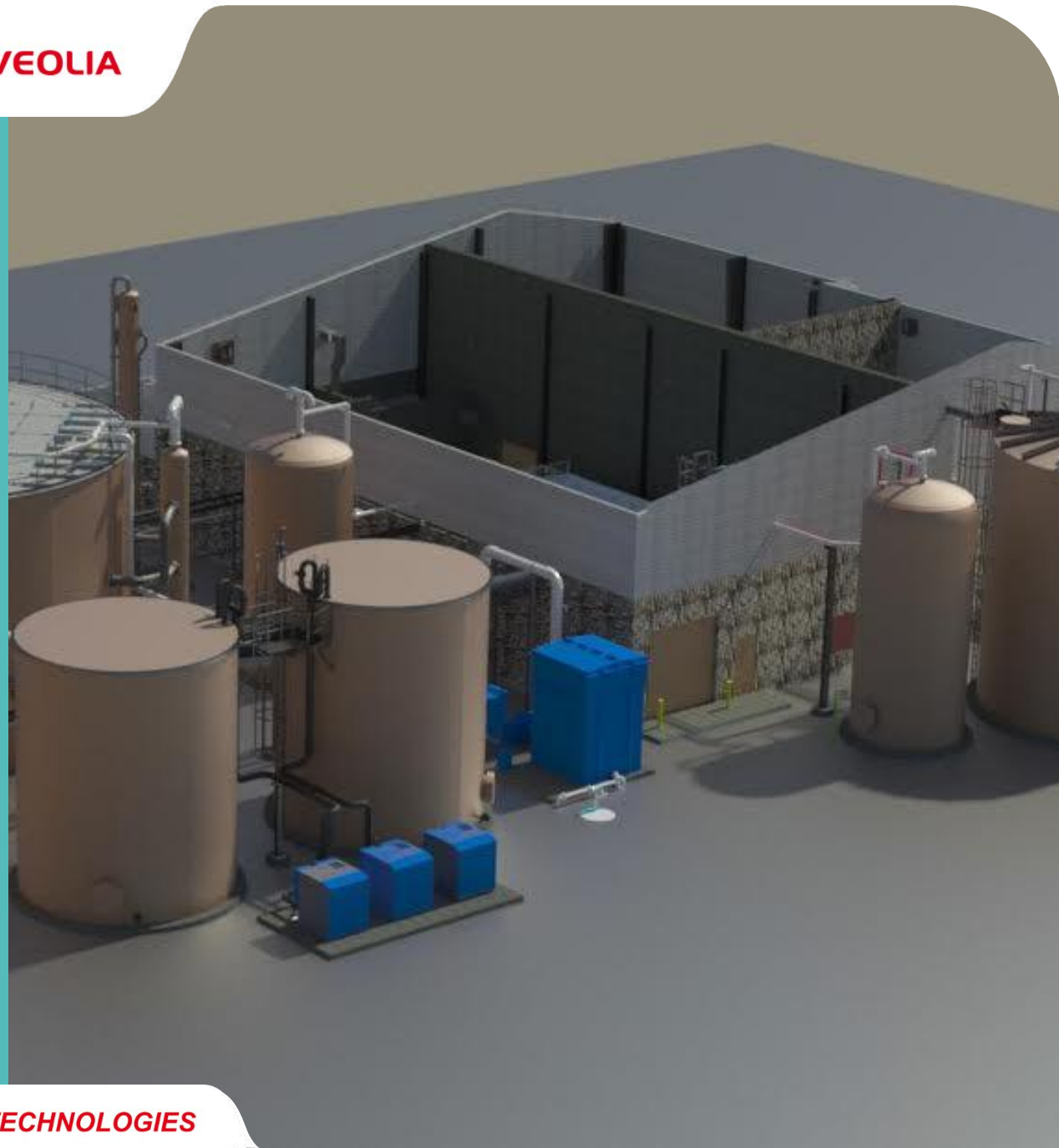


ANHEUSER-BUSCH



DIAGEO

# Common Drivers for Industrial Pretreatment





# Most Common Industrial Key Project Drivers





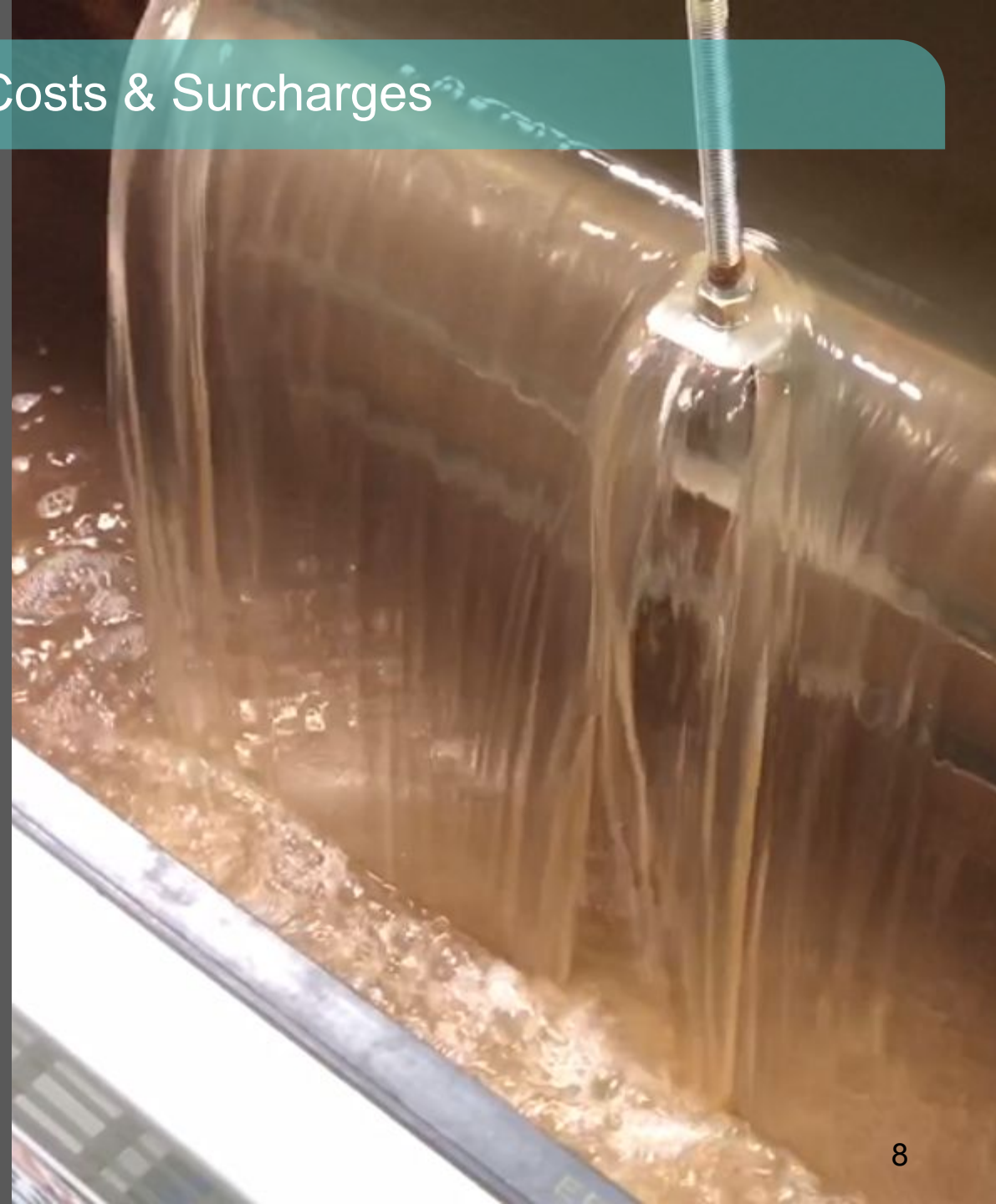
# Main Ways to Reduce Wastewater Treatment Costs & Surcharges

**Water audits** to reduce wastewater generation (flow and load)

**Reduce TSS/FOG surcharges** – solids removal with DAF (Dissolved Air Flotation)

**Reduce BOD surcharges** – biological treatment technologies (anaerobic and/or aerobic)

**Reducing other surcharges/limits** (TDS, COD, N and P) may require full treatment – get off the sewer?



# Project Background

*“First-of-its-kind” Wastewater Treatment Facility*





# Project Overview

## About the Project

A leading chocolate manufacturer was looking to enhance the quality of its effluent and secure the manufacturer's current and future wastewater treatment needs at its flagship manufacturing campus.

**KEY DRIVERS:** Future Proofing & Replace Outdated Wastewater Facility

## PROJECT DESIGN BASIS

### Influent Parameters

Influent Flow: 500-850 gpm

Peak Flow: 1 MGD

Total COD: 20,000-35,000 lb/day

TSS: 200-500 mg/l

FOG: 25-75 mg/l

Temperature: 85-95° F

### Effluent Parameters

BOD5: <10 ppm

TSS: <10 ppm

Ammonia: <5 ppm

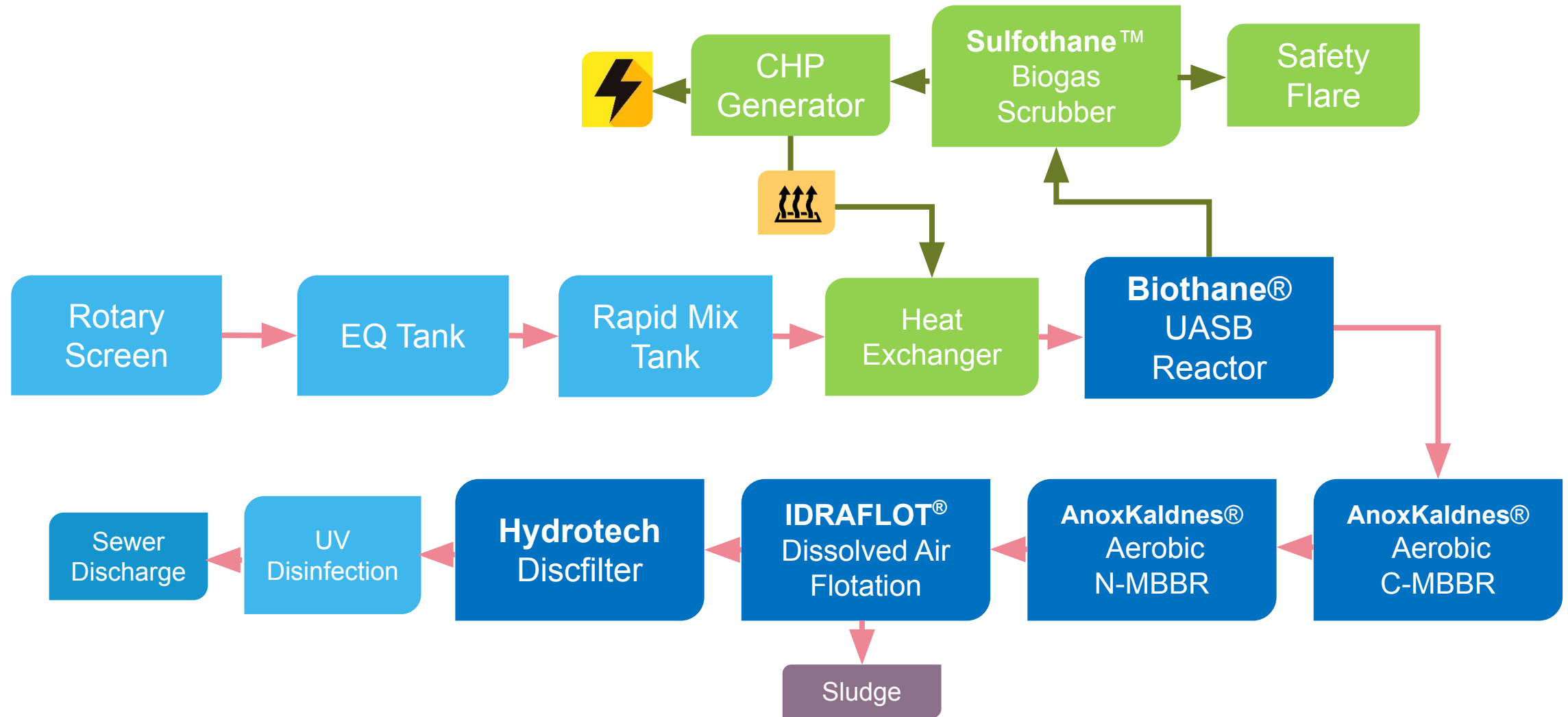
TP: <2 ppm

pH: 6-9

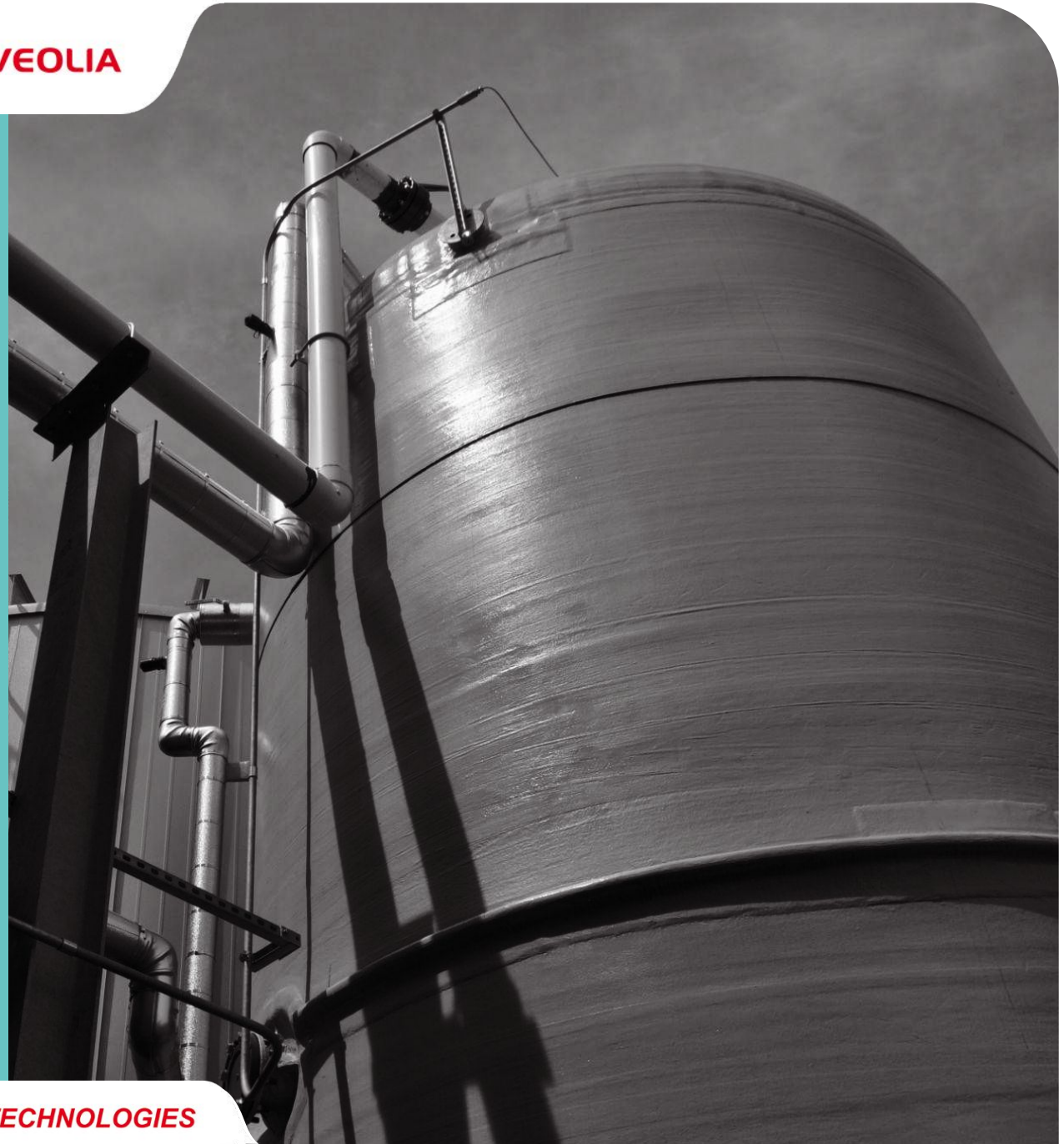




# Project Process Flow Diagram



# Virtual Tour and Technology Review





# Virtual Tour

A5

## Equalization Tank

Volume: 632,000 gal  
62 ft (diameter) x 28 ft (height)

A4

## Calamity Tank

Volume: 100,000 gal  
25 ft (diameter) x 28 ft (height)

A1

## Raw Influent Sump

Volume 7,000 gal  
10 ft (diameter) x 12 ft (deep)

A3

## Screened Sump

Volume 4,700 gal  
10 ft (diameter) x 8 ft (deep)

A2

## Rotary Screen

Large Solids Removal





# Virtual Tour

Calamity Tank

Raw Influent Sump

Screened Influent Sump

Rotary Screen  
(Located inside main building)

EQ Tank





# Virtual Tour



B

## Biothane® Advanced UASB Reactor

*Upflow Anaerobic Sludge Bed*

Volume: 395,000 gal  
49 ft (diameter) x 28 ft (height)

**Biobed® Advanced Settler**  
*Inside the reactor, the proprietary settler allows biomass to remain in the reactor while separating effluent and biogas*



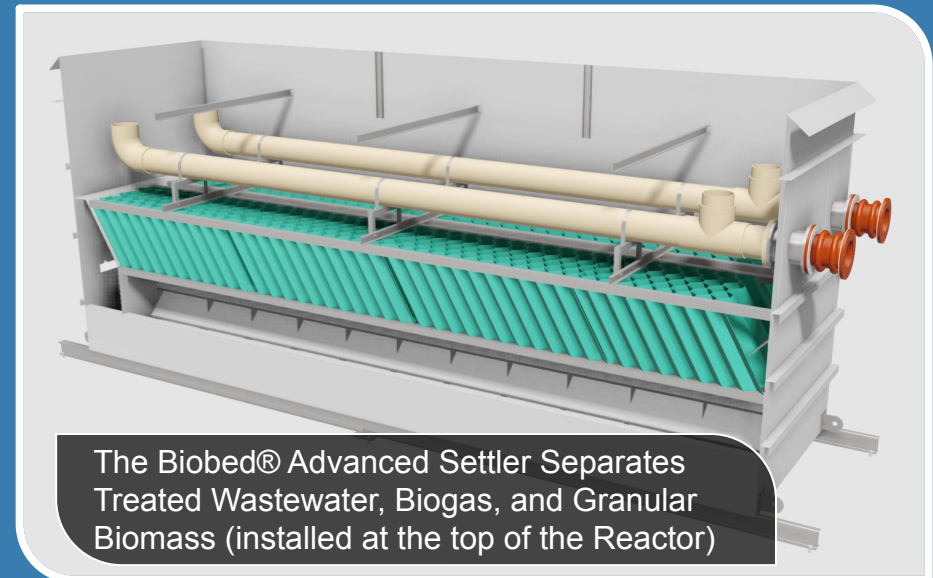


# Virtual Tour

Biothane® UASB Anaerobic Reactor with Advanced Settler



Feed Distribution Piping for the Biothane® UASB

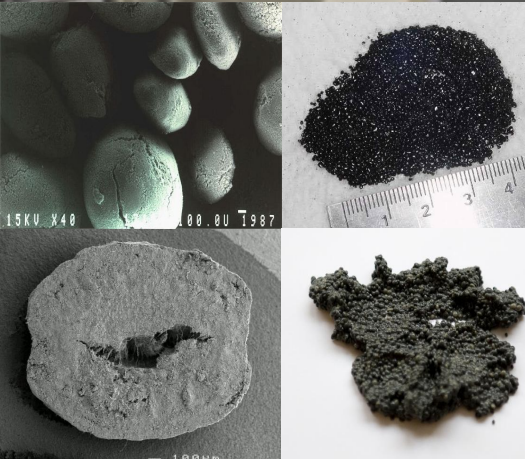
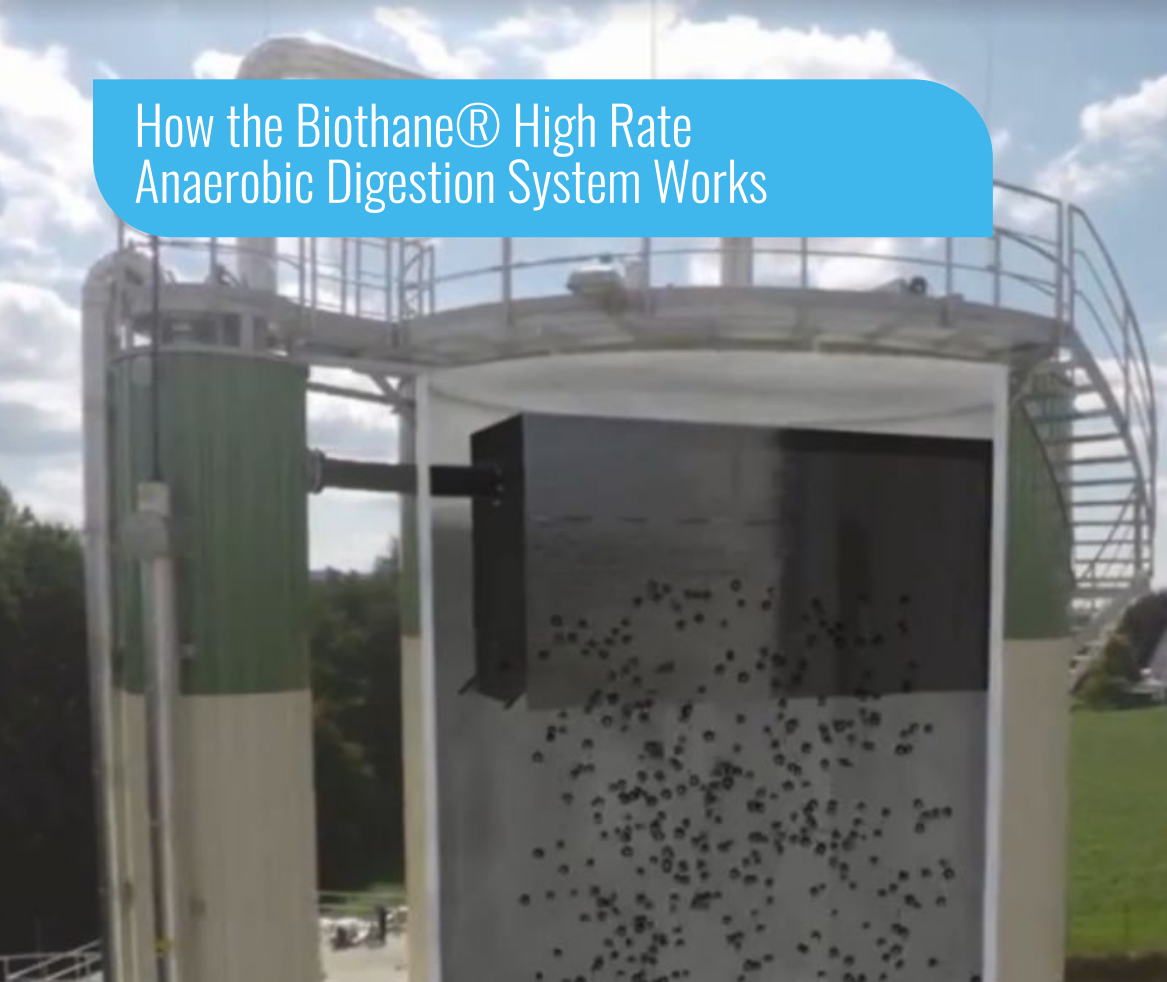


The Biobed® Advanced Settler Separates Treated Wastewater, Biogas, and Granular Biomass (installed at the top of the Reactor)





# How the Biothane® High Rate Anaerobic Digestion System Works



## Healthy Granular Biomass

Biomass has a Very fast settling velocity within the reactor

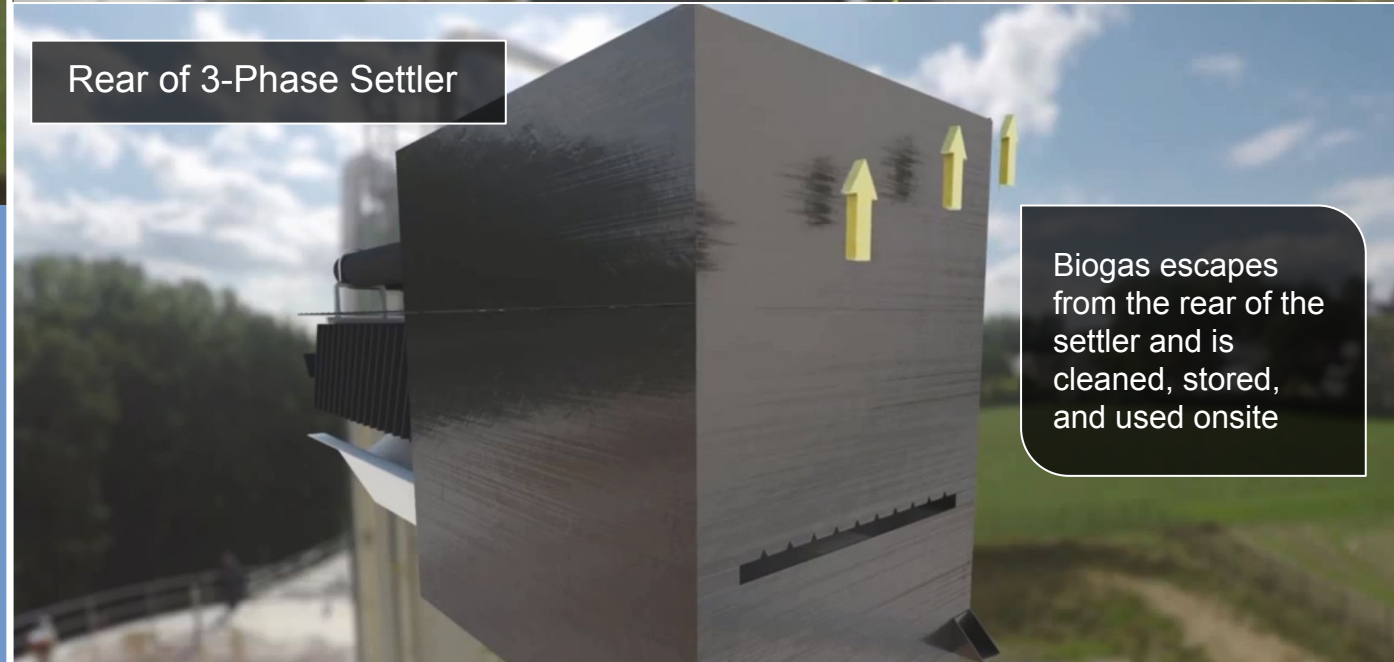
## Front of 3-Phase Settler



Effluent Weirs

Tilted Plates for Enhanced Biomass Settling, but allows Biogas to pass through

## Rear of 3-Phase Settler



Biogas escapes from the rear of the settler and is cleaned, stored, and used onsite



# Virtual Tour

C

## AnoxKaldnes® MBBR

*Moving Bed Biological Reactors with K5 Media*

C1

### BOD REMOVAL

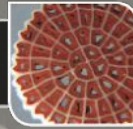
Volume: 62,000 gal  
21 ft (diameter) x 24 ft (height)

C2

### NITRIFICATION

Volume: 62,000 gal  
21 ft (diameter) x 24 ft (height)

AnoxKaldnes®  
K5 MBBR Media



C1

C2





# Virtual Tour

AnoxKaldnes® 2-Stage Moving Bed Biofilm Reactors



## What's Inside the Reactors?

The aerobic reactors are filled with the Anox K5 Media. The media provides a protected surface for the biofilm to grow while maximizing surface area





# MBBR Internal Components (example)

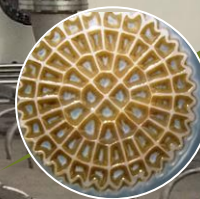
**Sieves**  
(Keep Media In)

**Tank**  
new or existing,  
concrete, steel

**Aeration  
Downpipes**  
(Air from Blowers)

**Aeration Grid**

**Biomedia**





# Virtual Tour



D

**IDRAFLOT® - Dissolved Air Flotation**

**SOLIDS REMOVAL POST MBBR**

Volume: 20,300 gal  
Length: 24 ft





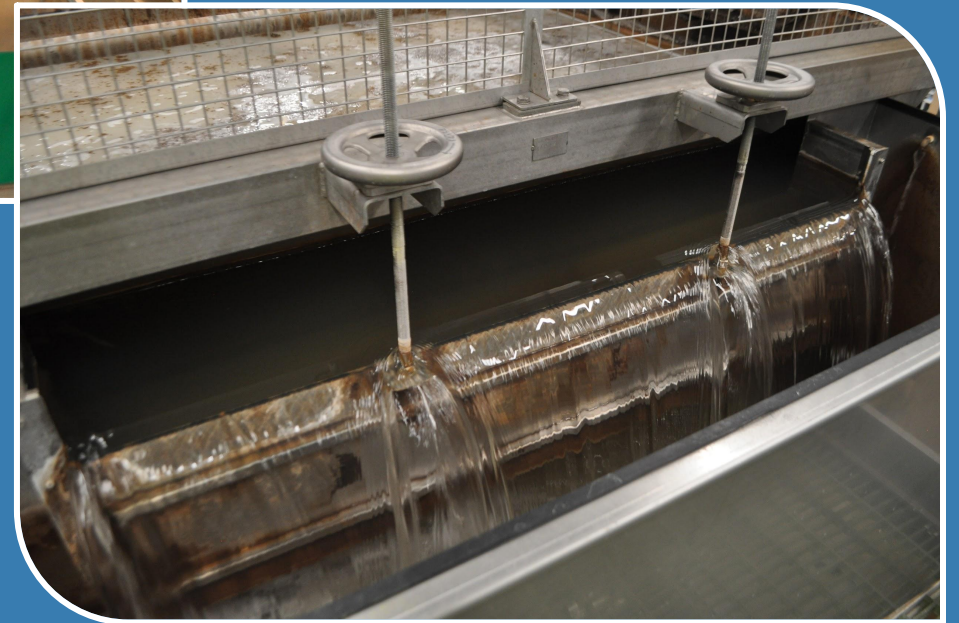
# Virtual Tour

IDRAFLOT® DAF Unit  
(Top View)



Top Photo  
Side view of IDRAFLOT®

Bottom Photo  
Treated Effluent from IDRAFLOT®  
DAF Unit





# Virtual Tour



E

**Hydrotech Discfilter**  
*Solids polishing*  
Filters particles  $\geq 10\mu\text{m}$

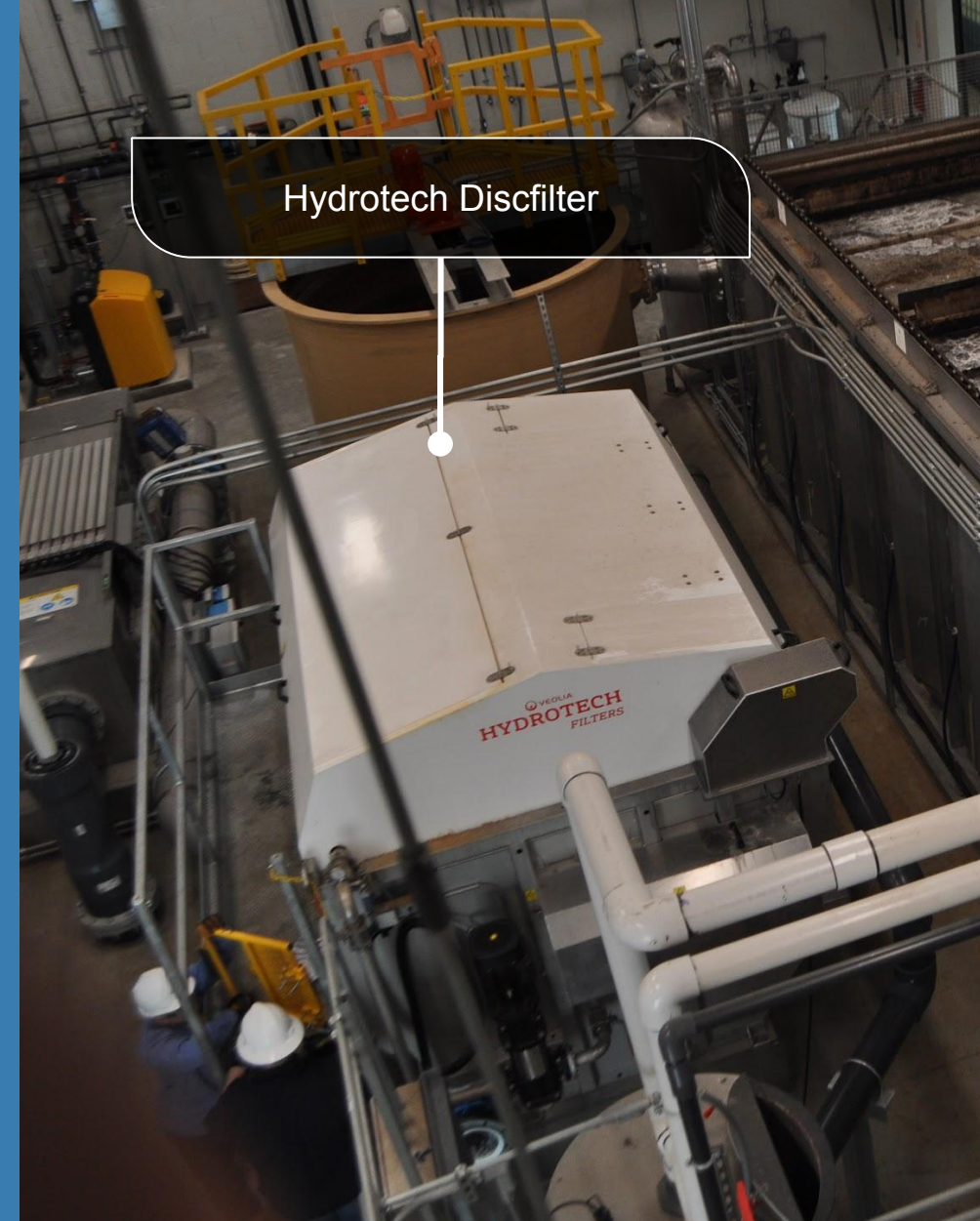




# Virtual Tour

Top Photo  
Hydrotech Discfilter side  
view

Bottom Photo  
The inside-out filtration  
panels are assembled  
inside the Discfilter unit to  
provide TSS polishing





# Virtual Tour



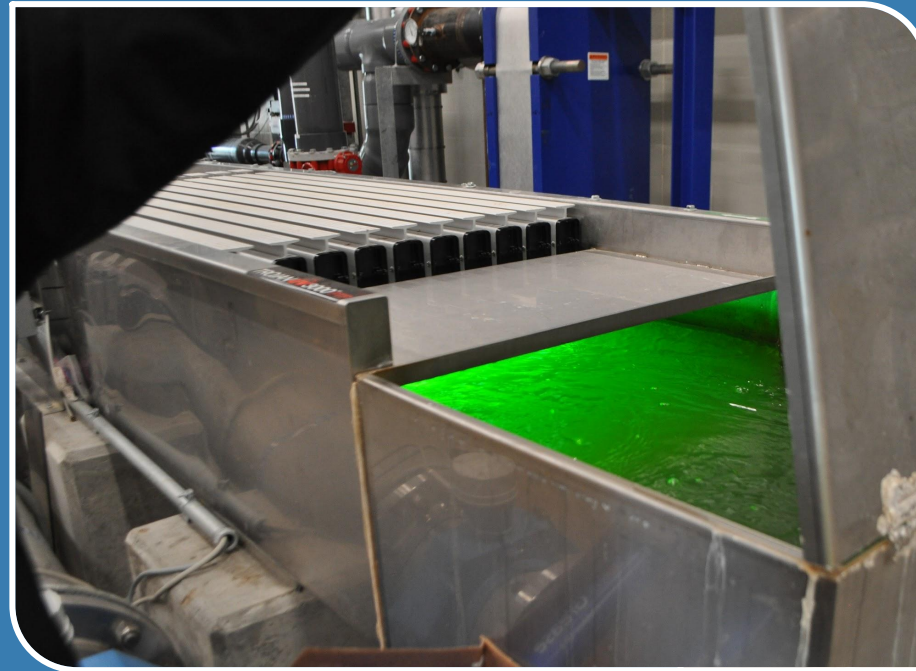
F  
UV Disinfection  
Prior to discharge





# Virtual Tour

UV Disinfection is the final step to neutralize microorganisms prior to the effluent being discharged to the municipality.





# Virtual Tour



G1

**Sulfothane®**  
Biogas H<sub>2</sub>S Removal System

G4

**Safety Flare**

G3

**Combined Heat & Power System**

Max Electric Output: 750 kW/hr  
Max Heat Output: 300 million BTU/hr

G2

**Biogas Storage System**





# Virtual Tour

Sulfothane® Biogas  
H<sub>2</sub>S Removal System

Combined Heat/Power  
Generator System Building

Inside the CHP Building

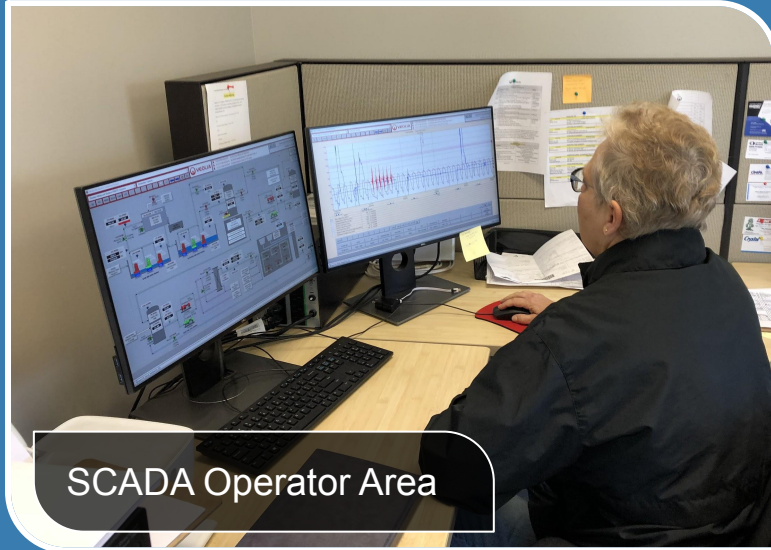
Biogas Storage System

Enclosed Safety Flare





# Virtual Tour (Additional Photos)



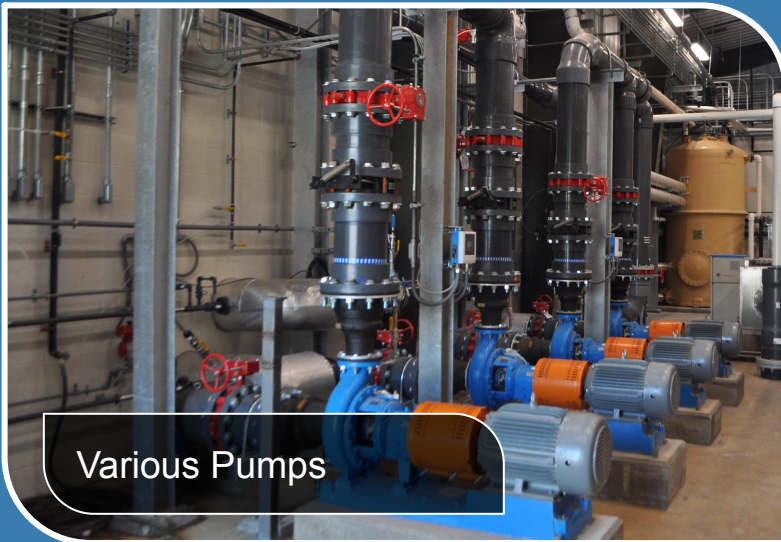
SCADA Operator Area



Inline Analysis Equipment



WWTP from Street  
View shows how tanks are minimally visible



Various Pumps



Odor Management System



Onsite Lab





# Key Takeaways

*For Industrial Wastewater Projects*

## Identify Key Drivers

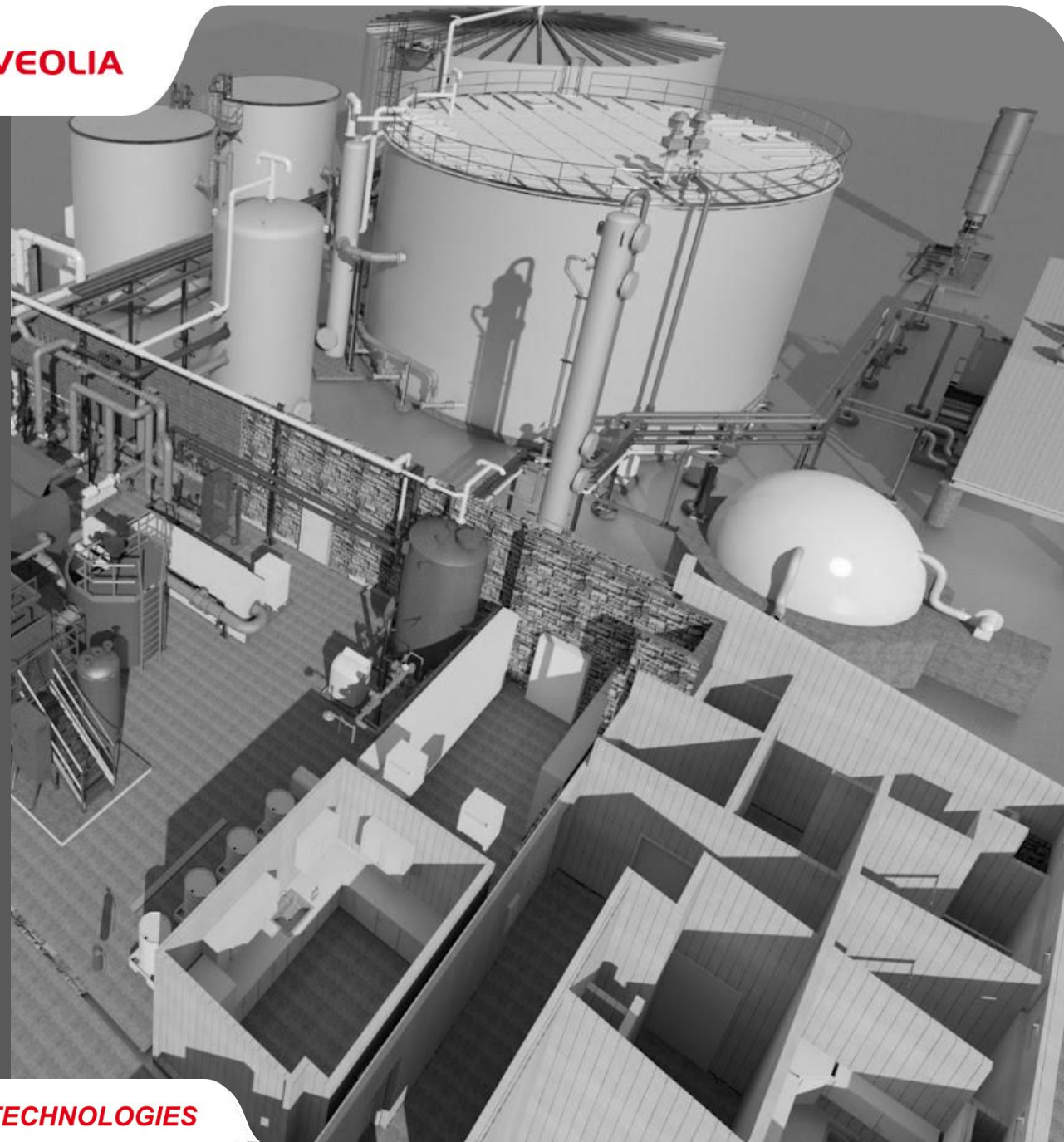
What are the costs and risks related to water / wastewater (OPEX, Regulatory, Flow limitations, etc.)

## Collect “Good” Site WW Data

**Engage potential technology partners early in the process**

## Tax and Energy Advantages

There is existing and pending government tax incentives that will significantly shorten the ROI for Anaerobic Digestion Projects





# Questions & Answers?

## Contact Info:

### Graig Rosenberger

*Vice President - Veolia Water  
Technologies Philadelphia Office*

[Graig.Rosenberger@veolia.com](mailto:Graig.Rosenberger@veolia.com)

+1 856 438-1769

