



# The Green Solution for Pretreatment of H<sub>2</sub>S & FOGs

## EPA – New England 14<sup>th</sup> Annual Pretreatment Workshop

### **BOC Treats Whole Collection System**

- Eliminate FOGs & slime layers
- Control H<sub>2</sub>S levels, odors & corrosion
- Maintain high dissolved oxygen levels
- Lower bod & ammonia levels
- Replace toxic chemicals
- Achieve major cost and energy savings

### **Bio-Organic Catalyst: Some Basics**

- Contains no live bacteria
- Is a concentrated liquid
- Functions at small dosage levels: ppm
- Completely non-toxic & biodegradable

### **Green chemistry: Bio-organic Catalyst**

- Combines surfactants with a unique fermentation intermediate
- Forms fine oxygen-rich micro-bubbles in presence of turbulence
- Raises the dissolved oxygen content of water
- Accelerates gas transfer
- Allows greater biological oxidation in wastewater
- Rapidly degrades slime layers & FOGs at the molecular level

### **Green Products for Pretreatment**

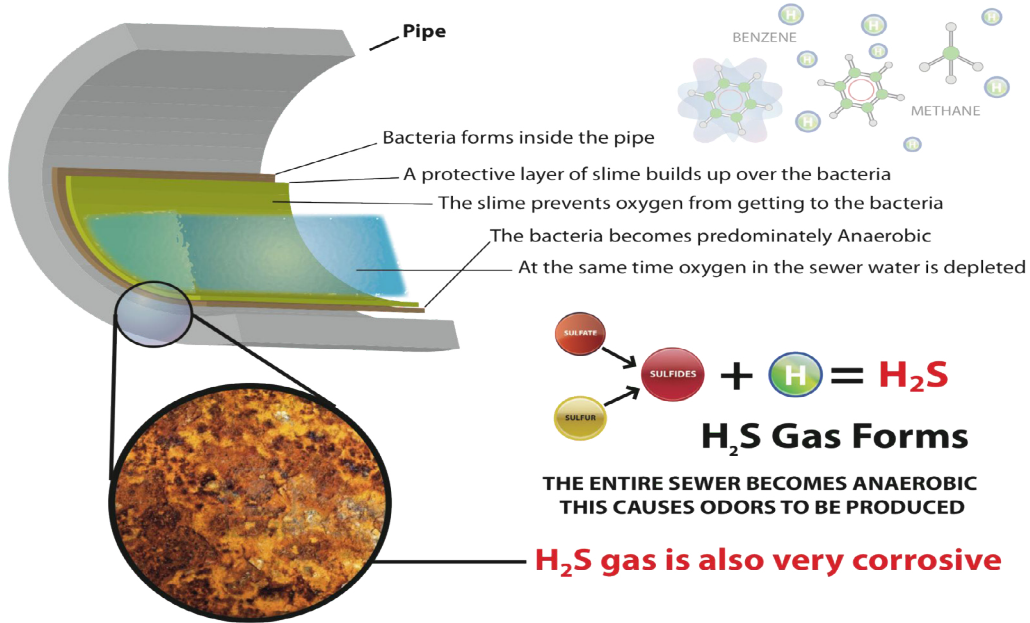
- EcoCatalyst®
  - Pretreatment of FOGs
- EcoSystem Plus®
  - Pretreatment of H<sub>2</sub>S and Noxious Gases

### **Collection System Maintenance**

- Slime layers and FOGs are chronic in all collection systems
- Severity depends on system design, flow, grease interceptors
- Hydraulic dynamics – turbulence - releases H<sub>2</sub>S
- Chronic H<sub>2</sub>S corrodes infrastructure
- Maintain DO above 1.0 mg/L and H<sub>2</sub>S gas is minimized

# How H<sub>2</sub>S Forms

## SLIME LAYER FORMATION AND ODOR GENERATION

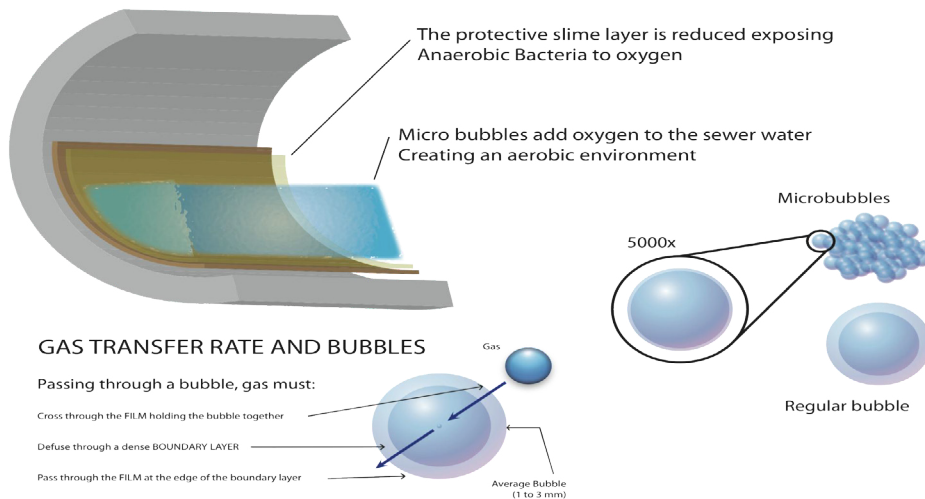


## BOC Odor Control and Slime Layer Degradation

- BOC creates a highly enriched layer of dissolved oxygen
- BOC-DO layer oxidizes noxious gases released from solution
- Acts like a bio-filter to immediately reduce noxious odors
- Movement of wastewater surface activates BOC-DO layer
- Scrubs off slime layers inside collection system
- Scrubbing action degrades floating and adhered grease

## How BOC Functions

### DEGRADATION OF SLIME LAYERS WITH BOC



**With continuous use of BOC the pipe is cleaned and flow is increased, eliminating the possibility of odor blooms at the same time preventing corrosion**

## BOC Eliminates FOGs & Grease Blockages

- Lipid ester bonds in fat molecules are rapidly cleaved
- Fats are reduced to glycerol and essential fatty acids
- Fat molecules cannot reform
- Glycerol is water soluble and readily degraded by micro organisms
- Essential fatty acids metabolized by bacteria as a high energy food
- Carbon boosts nitrification reduction and anaerobic digestion

## BOC Delivers Better Wastewater to WWTP

- Increases Dissolved Oxygen in severely overloaded systems
- Can lower BOD by 80% in wastewater arriving at WWTP
- Saves energy in WWTP aeration by 25 to 60%
- Increases biogas production in anaerobic digesters by 60 to 80%
- Creates a rich source of carbon for nitrification reduction processes

## BOC Needs Proper Oxygenation

- BOC can be applied with sufficient existing oxygenation:
  - Normal turbulence in gravity flow lines
  - Immediately upstream of any large pumps
- BOC can be applied with additional oxygenation:
  - Power washer
  - Jet truck
  - Coarse air diffuser
  - Mister or aerator
  - Firehose
  - Regenerative blower

## Case Study #1 H<sub>2</sub>S Odor Control at Gillette Stadium / Retail Complex

### Benefits of BOC at Gillette Stadium

#### Situation:

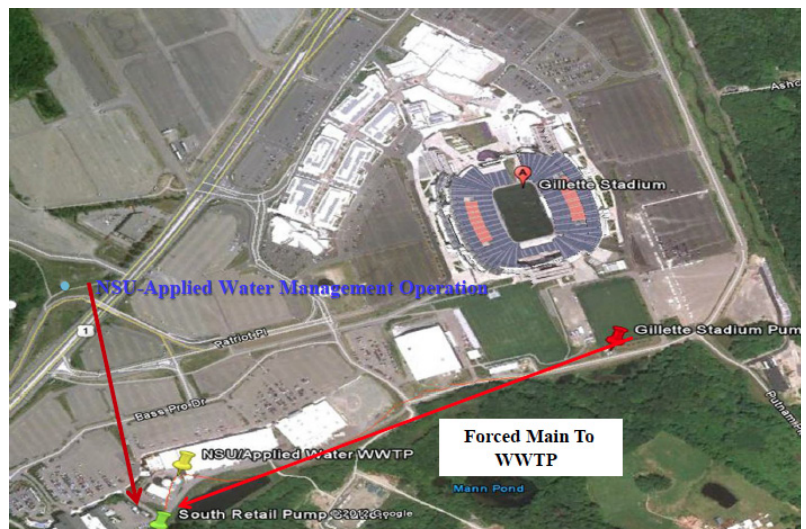
- SBR Membrane System operated by NSU-Applied Water
- Used Bioxide and VX-456 to control odors
- Community complaints re odors

#### Treatment:

- EcoSystem Plus injected with aeration into two wet wells

#### Results:

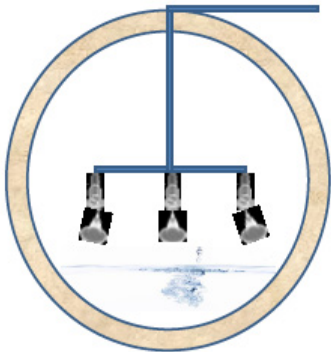
- H<sub>2</sub>S Odors Eliminated
- Community Satisfied
- Reduced H<sub>2</sub>S Treatment Cost ~ 50 to 60%
- Reduced FOG Removal & Hauling Cost



## Case study #2

### H2S Reduction Kiewit Construction Sewer Relining Project Fountain Valley, CA

Portable system for odor and h2s control injected 1.5 miles upstream from relining pit



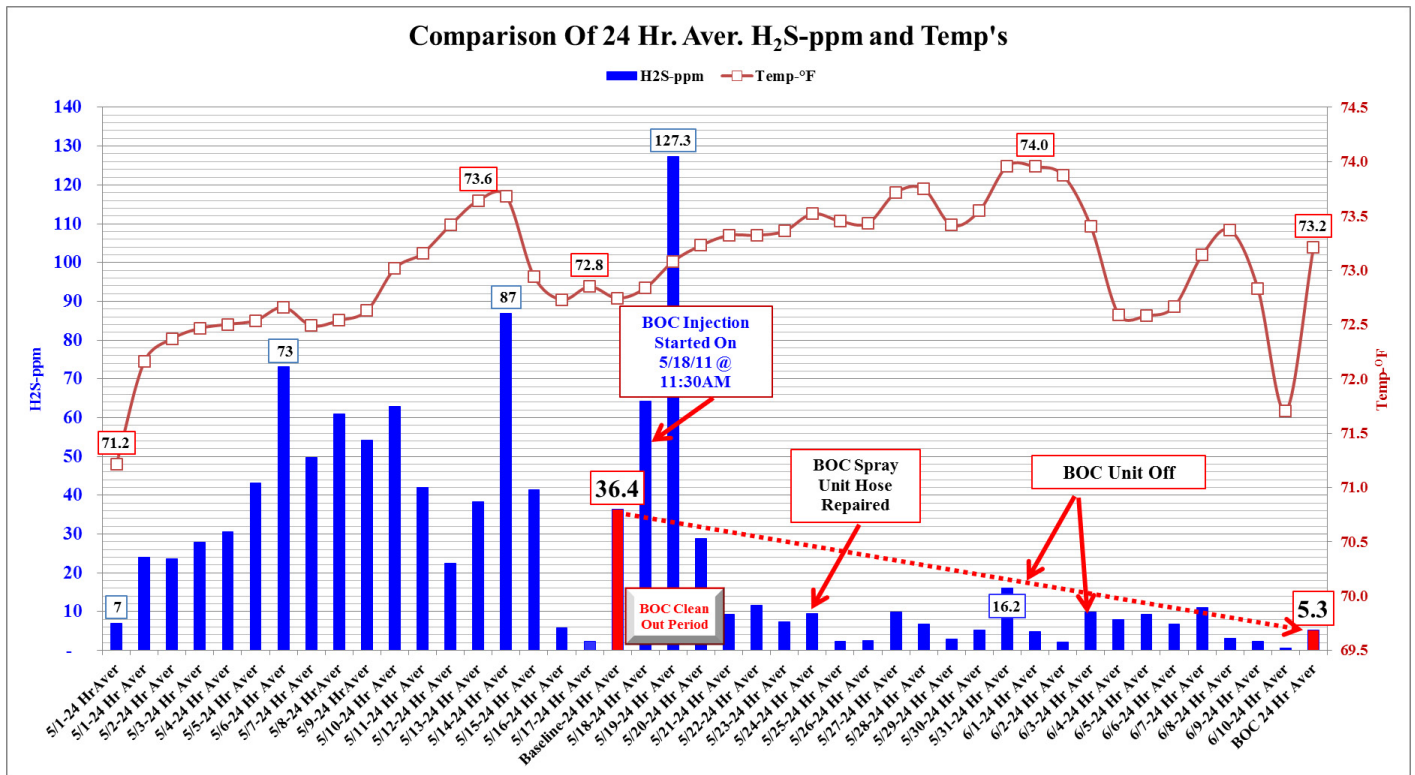
#### General Spray Nozzle Concept - Misting and Fogging Nozzles

Providing the smallest atomized spray droplets of all of our spray nozzles, All nozzles are easy to clean and have a strainer. Strainer has a brass body with stainless steel 120×120 mesh. Spray angle is 80° for full cone spray nozzles; Maximum pressure is 500 psi. Maximum temperature is 180° F. Connection is NPT male.



1,000 Liter Solution Tote Bin

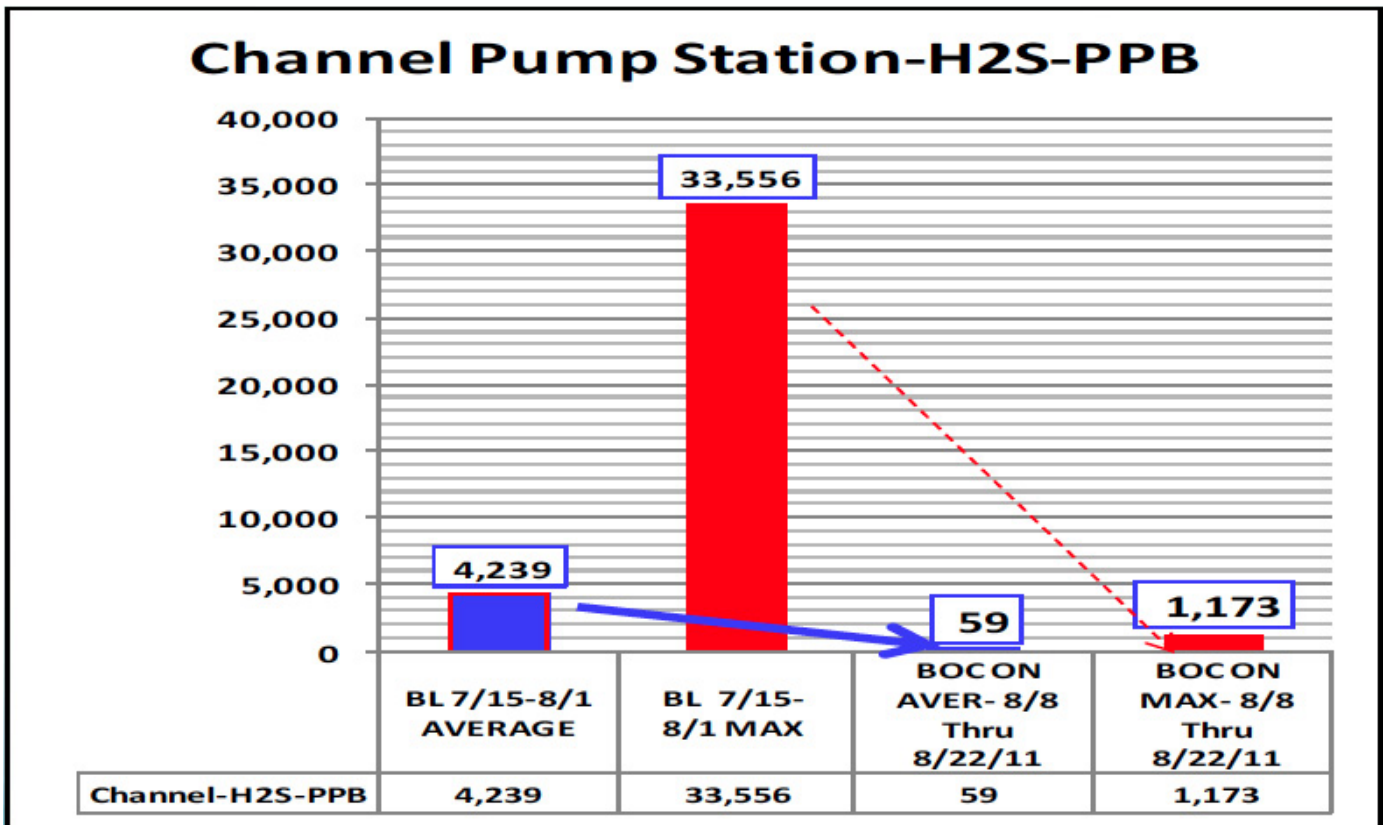
# BOC Dramatically Lowers H<sub>2</sub>S Levels



## Case Study #3 H<sub>2</sub>S Reduction in San Francisco System



## H<sub>2</sub>S Reduced in 5 miles of Collection System



### Case Study #4

Breakdown and Solubilization of FOGs MWRA, Deer Island, Boston Secondary Clarifier Influent Channel



### **Before Treatment**

#### **FOG mass was dense and hard.**

- 95' Long
- 6' Wide
- 5' Deep



### **After 11 Days**

- FOGs Eliminated
- FOGs Cannot Reform
- Floating Plastics Separated



### **FOG treatment with BOC**

- FOGs are completely solubilized
- FOGs will not reform
- FOGs = high energy food for bacteria
- Save on energy for aeration
- Boost anaerobic digestion
- Plastics & floating debris separated
- Odors eliminated

### **Economic Benefits of BOC for Pretreatment**

- 40-60 % less cost than conventional chemicals for odor treatment
- Eliminates FOG removal, hauling and disposal costs
- Labor savings
- Savings on infrastructure replacement from corrosion

### **Eliminate FOGs & slime layers**

- Control H<sub>2</sub>S levels, odors & corrosion
- Maintain high dissolved oxygen levels
- Lower bod & ammonia levels
- Replace toxic chemicals
- Achieve major cost and energy savings
- BOC makes collection system a treatment system

## **Current BOC Installations**

- Gillette Stadium - NSU/Applied Water Management
- San Francisco, CA
- Fountain Valley, CA - Kiewit Construction
- Ridgewood, NJ
- Brewster, NY
- Wappinger's Falls, NY - Severn Trent
- Carmel, NY - Severn Trent
- Market Basket - Demoulas Grocery Stores

*The authors would like to thank the EPA – New England 14th Annual Pretreatment Workshop for the opportunity to present this program on Bio-Organic Catalyst, the Green Solution for Pretreatment of H<sub>2</sub>S and FOGs.*

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