

Tomorrows Solutions  
Fairfax County, Virginia  
Gets a Head start on the Future



Summer 2008  
Anchorage Alaska

Clyde Wilber – Greeley and Hansen LLC

# Agenda

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- 💧 Drivers
- 💧 A History of Ever More Stringent Nitrogen and Phosphorus Control
- 💧 Nutrient Trading and Money
- 💧 MBBR
- 💧 Re-use
- 💧 Green Building Policy
- 💧 Landfill Gas for Solids Incineration
- 💧 Stormwater?
- 💧 Funding vs. Regulatory Driven
- 💧 Future Prepared?

# Drivers: Then and Now

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- 💧 Then: Lady Bird Johnson
  - 💧 Now County Supervisor Staffers
  - 💧 Future – Y Generation of Green Staff
- 💧 Then: Potomac River Algal Blooms Smell
  - 💧 Now: The Chesapeake Bay
  - 💧 Future: Transgender Fish
- 💧 Then: VDEQ Staff
  - 💧 Now: 7 Chesapeake Bay Governors + DC Mayor
  - 💧 Future: O-OECA?
- 💧 Then: 8 Million in Bay Watershed
  - 💧 Now: 15 Million
  - 💧 Future: 20 Million
- 💧 Then POTWs
  - 💧 Now: Agriculture and Urban Stormwater
  - 💧 Future: Power Plants
- 💧 Then: Dissolved Oxygen
  - 💧 Now: Dissolved Oxygen
  - 💧 Future: EDCs?



# A History of Ever More Stringent Nitrogen and Phosphorus Control

## 💧 THEN

- 💧 1971 - Potomac Enforcement Conference TN=1
- 💧 1970s-1990s – Consent Orders Allowing  $\text{NH}_3\text{-N} = 1$
- 💧 1980s – TP = 0.18 mg/l
- 💧 2000 – TN=8 by Grant Agreement (not in permits)

## 💧 NOW

- 💧 2010 – TN = 3 mg/l in Permits

## 💧 Future

- 💧 2013 TMDL??
- 💧 Stormwater Treatment???



# Nutrient Trading and Money

- Then – 1970s through 1990s
  - State Does a “308” Plan - Imposes Permit Limits
- Then – 2000
  - State Provides “Incentive” Grants
- Now
  - State Imposes Permit limits
  - Allows for Trading –
  - Quasi Private Virginia Exchange Created
  - No Grant unless you agree to trade

# The Trading Spin

- One View
  - Trading allows most economical projects to go first (least \$/pound)
  - Trading preserves limited Grant Dollars – total savings estimated at ???
  - Trading allows for projects to be spread out without exceeding available contracting capacity. Difficult to document
- The other view
  - Trading enables others to pollute
  - Rise of the legislative eco-staff

# The Future of Trading?

- Most big plants want to go first
- Without Grant threat – “green” elected officials refuse to go along?
- Prices must be kept low to keep small communities in the loop
- Dedicated Exchange Leaders Required

# Fairfax County's Nutrient Controls

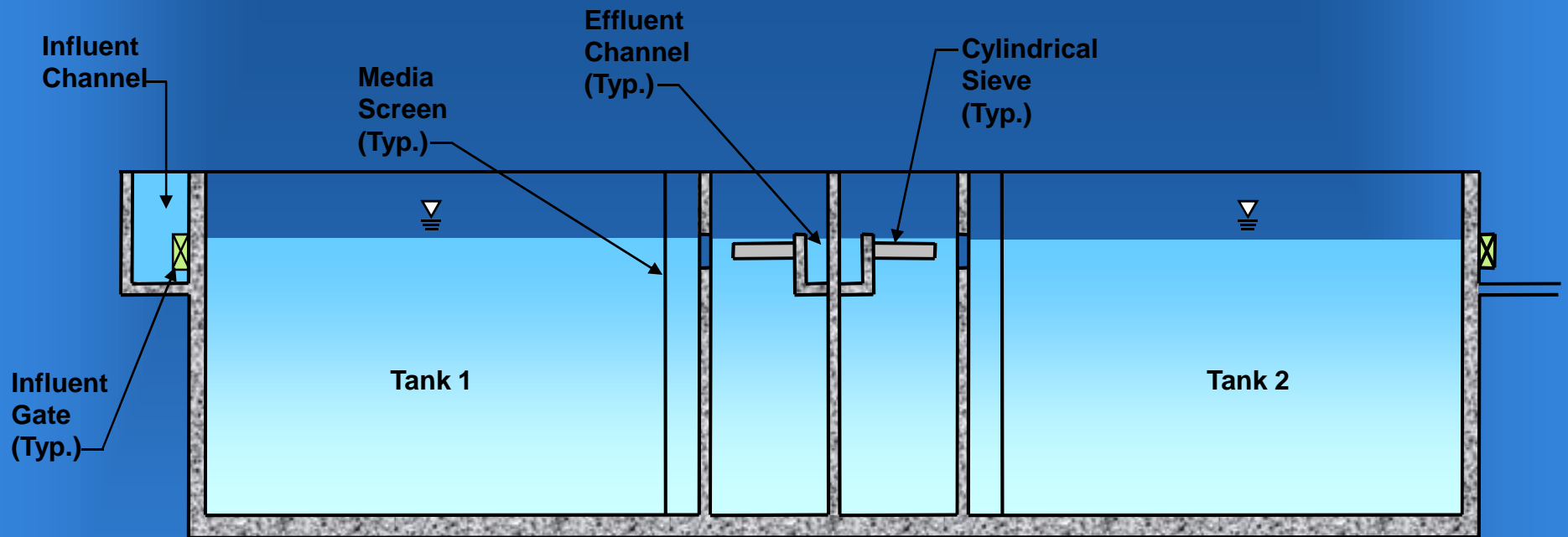
- Step Feed Aerobic/Anoxic Process
- Moving Bed Biofilm Reactor
- Water Reuse

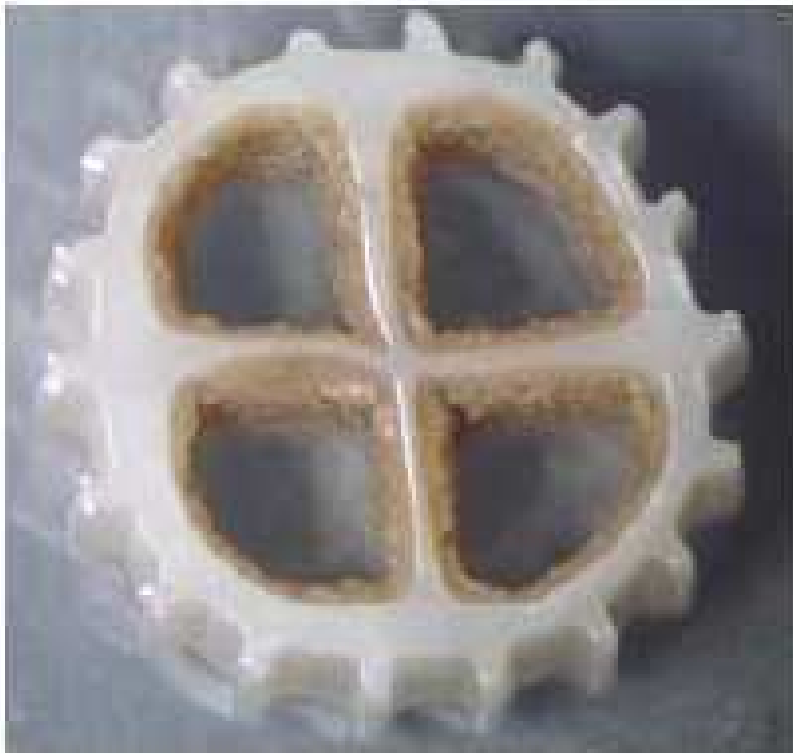


# MBBR

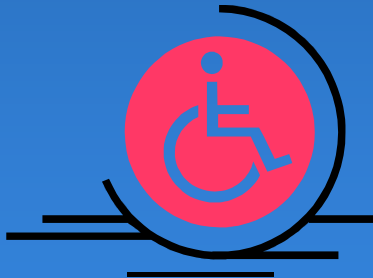
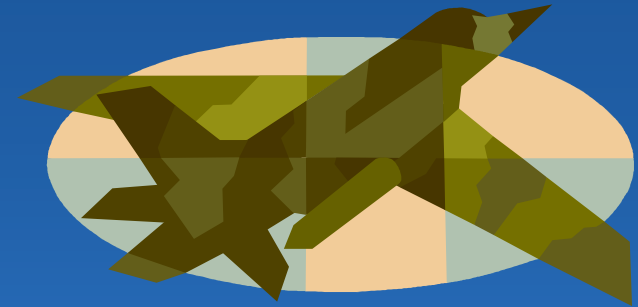
## Moving Bed Biofilm Reactor

# MBBR Tanks – Section





# Re-use Have a Big User



# Getting Re-use

- Regulations in Place?
- User Motivated – NOT Regulated
- Funding
- Re-structuring the Fee
- Intra-inter-extra-governmental Agreements
- Getting Nutrient credit?



# Green Building Policy To Green City



## PROJECT FACTS



# Landfill Gas – Electric Power Generation and WWTP Incinerator Fuel

### Refuse in Place

Currently 18 million tons

### Gas Collection System

350 gas wells are drilled into the landfill and connected with a network of pipes to the power plant

### Generator Packages

Eight Caterpillar 3516 gas engines

### Net Power Produced

6 Megawatts (MW)

3 mile Pipe - \$1 M/ Yr

### System Energy Savings

Equal to 600,000 barrels of oil per year or the equivalent of removing the emissions of 56,000 cars

**Landfill Gas at the Wastewater  
Treatment Plant**

# Chesapeake Bay Nutrient Controls Coming to Your local Theater Soon!

- Come see how this movie turns out in your Watershed!
- Will it be?...
  - A Tragedy!
  - A Mystery!
  - A Teen Slasher
  - French Farce
- You Get a Part!
  - Mr. Potter? Mr. Smith? Serpico? Machiavelli?



# How the POTWs Got Theirs

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- 175 Million Pounds/year – 7 states – 16 million People
- POTWs, Agriculture, Air Deposition (Power Plants/Cars) – Urban Stormwater
- Gang of 7 – POTWs get 3 mg/l at 2010 flows
- Virginia General Assembly
  - Don't steal our property! = 3 mg/l at Design Capacity (2010)VAMWA - Potomac Plants (NCPCP) 3 mg/l N at design Capacity. OK!
- But did we really get anything?....

Most Import  
Rule  
Show UP!

# Will Stormwater Pay the Piper?

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- Zero Sum Game
  - Must add to 175 Million #s/yr
- EPA 2004 Virginia Cost:
  - \$1 Billion for POTWs (2010 flows at 3 mg/l)
  - \$ 900 Million for Agriculture
  - \$ 500 Million for Stormwater
- 2007 Estimates
  - \$ 1.2 Billion of POTWs (Design Flows at 3 mg/l)
  - \$ 900 Million for Agriculture
  - \$ 5 Billion for Stormwater and rising

# Stormwater/Regulations/Permits

## MEP???

- Virginia Stormwater Permits
  - Monitor  
EVERY SINGLE DOG PARK???
  - Meet TMDLS (to come)
  - Have a plan
- Future
  - Maximum Extent Practical?
  - 5 X POTW cost?
  - Your Park, Street, Yard
  - VAMSA -

# Fairfax Stormwater

- No Impervious Fee
  - Give them a penny Instead
- 22 Watershed Plans - \$500 Million?
- Incidental Nitrogen
- Fecal/Ecoli TMDLS
- Four Mile Run TMDL
  - \$200 million





# Show me the Money!

Regulators  
Must Join Our  
Pain!

# Prepare for What Future?

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- 💧 Y Generation of Green Staff
- 💧 O-OECA?
- 💧 Transgender Fish
  
- 💧 Greening The Eco-City
  - 💧 Electricity (Coal-Trash-Biosolids-Water)
  - 💧 Land Use
  - 💧 Your: House - Car – Lawn – Commute
  - 💧 Urban Stormwater
  - 💧 Water Footprint – GHG – Gallons/capita