

# Media Filters Fundamentals

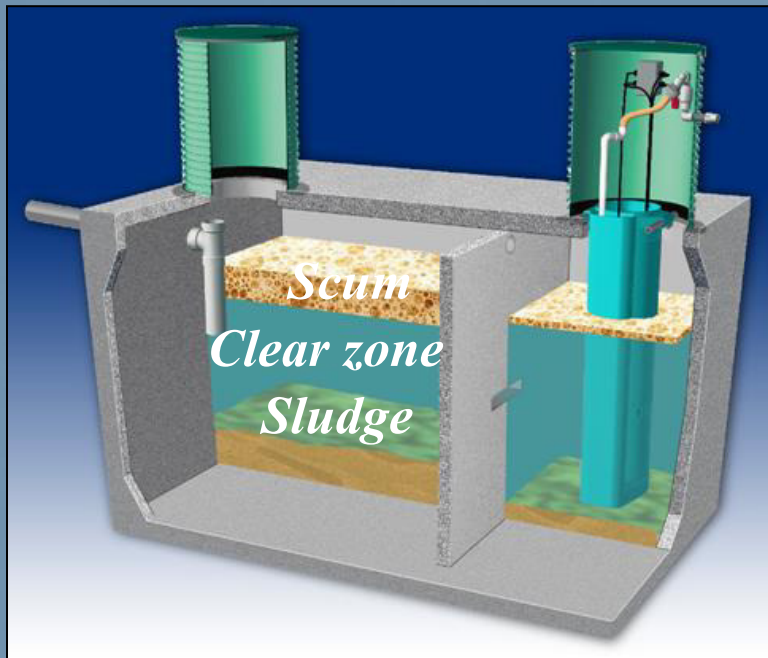
Napa Valley Wine Technical Group

March 25, 2010

Orenco Systems, Inc.

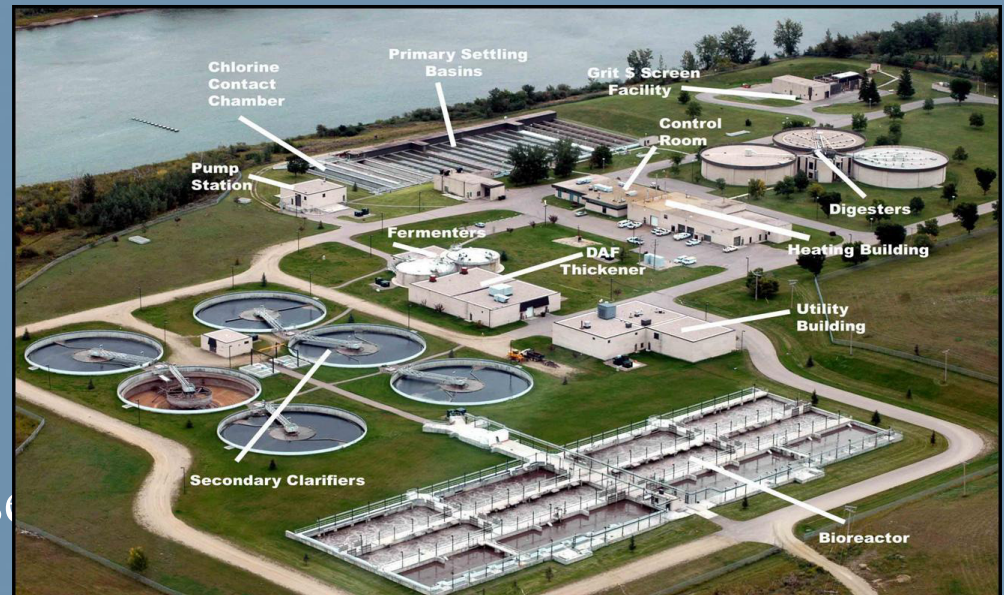
# Fundamental Processes of WW Treatment

- Physical
- Mechanical
- Biochemical



# Unit Processes of Wastewater Treatment

- Grit removal
- Primary sedimentation
- Aeration
- Final sedimentation
- Disinfection
- them turn it into inert gas (such as nitrogen)



# Wastewater Treatment

- Aerobic –

Carbon compounds + microbes + Oxygen =>  
Carbon Dioxide + Water + More microbes

- ~ With free oxygen
- ~ Rapid, efficient, more complete

- Anaerobic –

- ~ Without free oxygen
  - Oxidant may be Nitrate, Sulfate, etc.
- ~ Slow, inefficient, incomplete

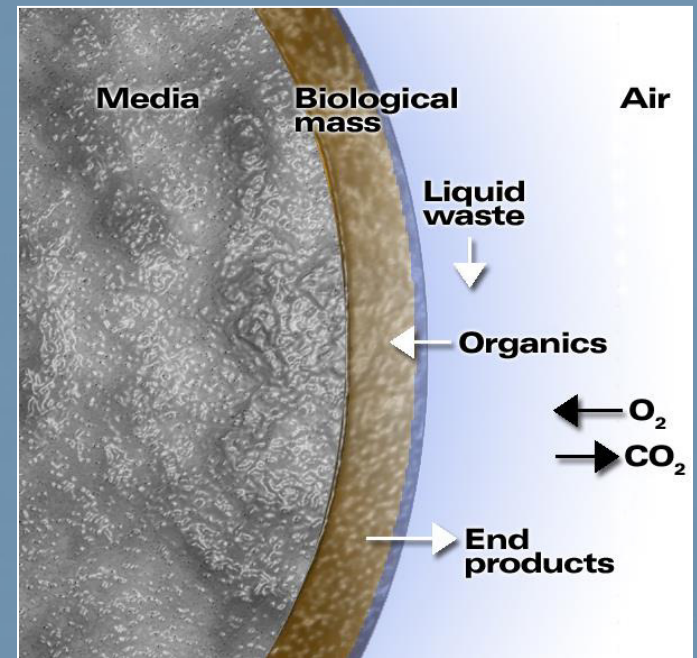
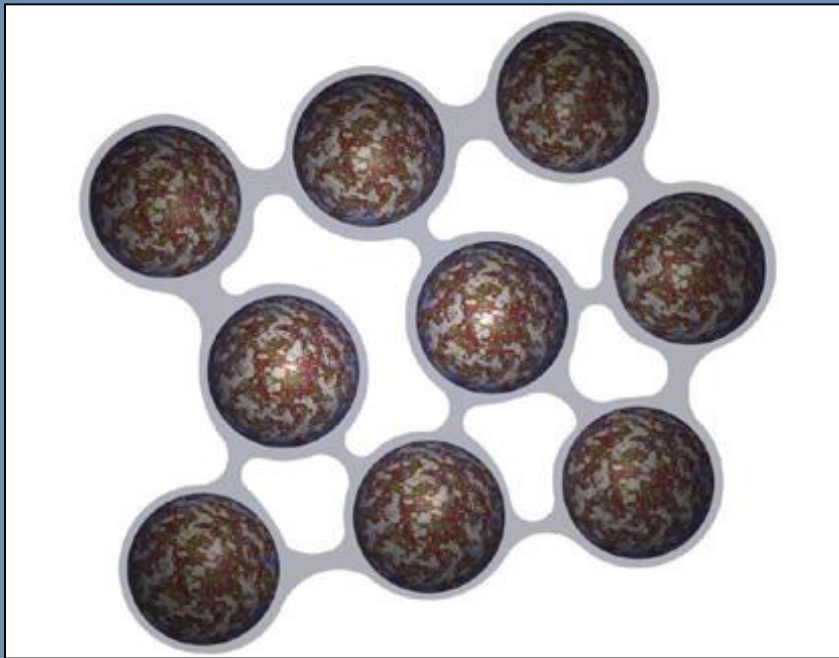
# Media Filters ... What Are They?

- Media filters (PBFs) are ...
  - ~ Secondary treatment units
  - ~ Designed to follow primary treatment in a septic tank
  - ~ A passive aerobic system
  - ~ Categorized as “fixed-film” treatment technology
- Example: Sand filter, AdvanTex™

# Media Filter Treatment Process

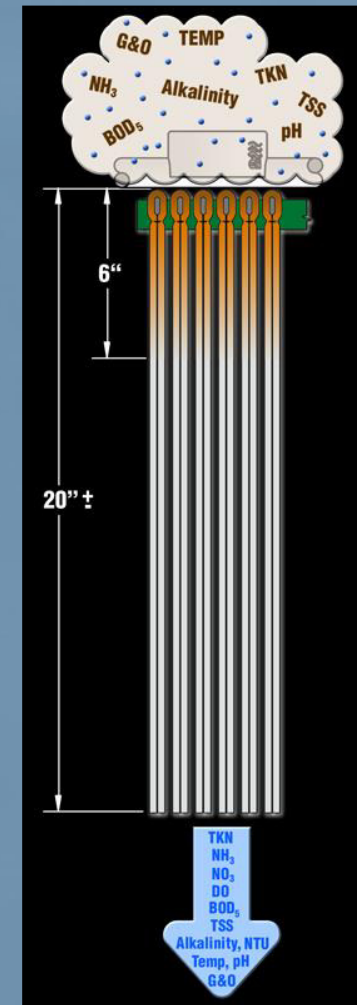
- Wastewater is applied in small doses
- It percolates over media in a thin film
- Organisms on media come in contact with wastewater
- Air is maintained in media pores
- Oxygen is transferred into the thin film and to organisms
- Aeration may be active or passive

# Fixed Film Treatment



# Packed Bed Filter Biofilms

- Oxygen is diffused from the air that fills the unsaturated voids into the effluent and biofilms
- After the carbonaceous demand is met in the upper levels of the media, autotrophic bacteria reduce inorganic constituents (such as ammonia) through nitrification (the conversion of ammonia to nitrate) in the lower region of the media

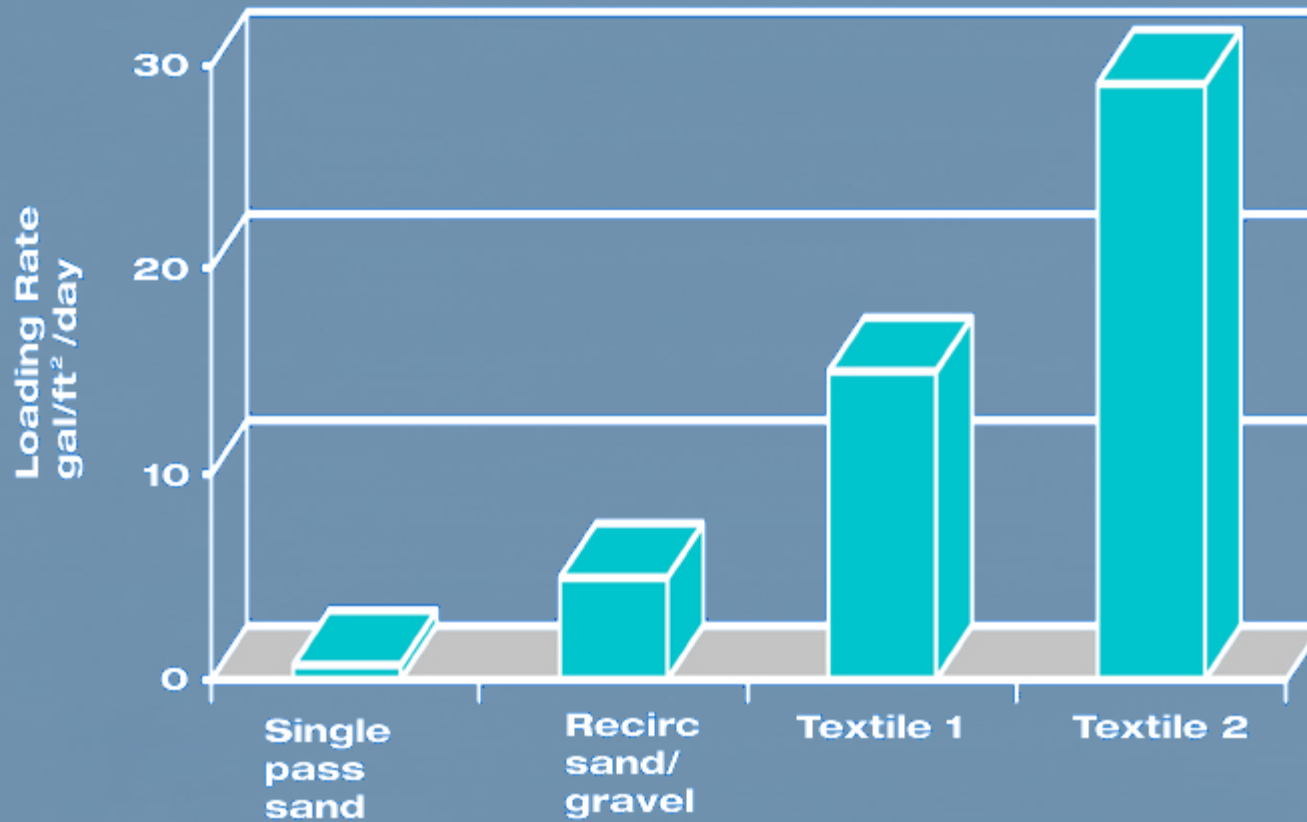




# Manufactured Media Types

- Textile fabric
- Open-cell foam cubes
- Hard plastic
- Crushed recycled glass
- Chipped recycled tires
- Processed slag

# Media Loading Rates



# Textile Filters

- They are recirculating media filters
  - ~ Like a recirculating sand filter
- They use textile instead of sand or gravel
- They require approximately 1/5 the area of an RSF and approximately 1/25 the area of an ISF
- The units arrive as pre-plumbed “pods” (plug and play)
  - ~ Just add electricity and sewage

# Examples of Media Filter Applications







# Some Considerations

- All wastewater treatment systems require routine maintenance for proper performance
- Watertight tanks are a MUST for all wastewater treatment systems



# Conclusions

- AdvanTex<sup>®</sup> textile filter systems can...
  - ~ be affordable for smaller flows on capital cost, O&M, and power consumption
  - ~ be used for phasing and “smart growth” of a facility
  - ~ provide high-quality effluent for a number of purposes, including reuse or irrigation