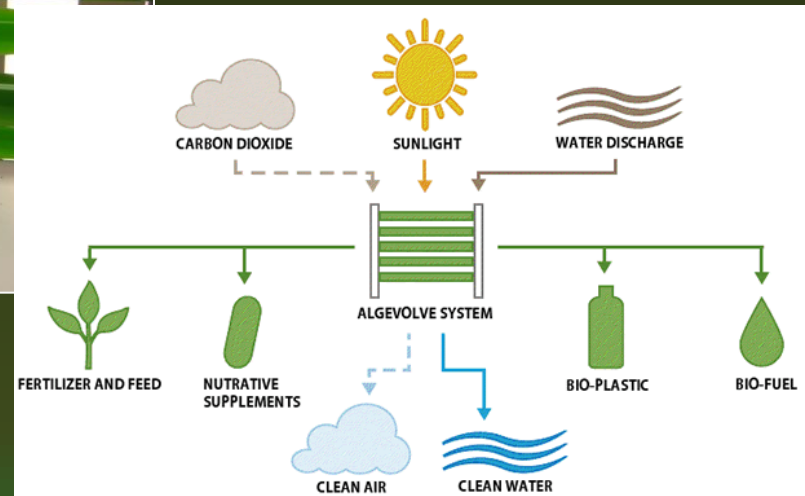
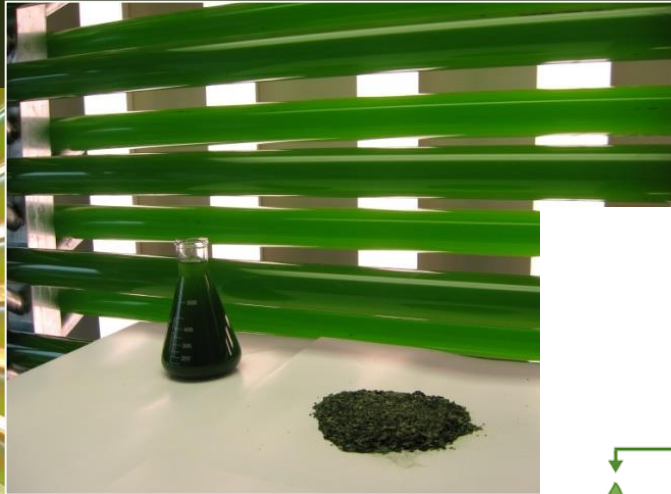


# Inland Empire Paper Company



DO TMDL Advisory Committee Update

Ryan Ekre, PhD

*April 15, 2012*

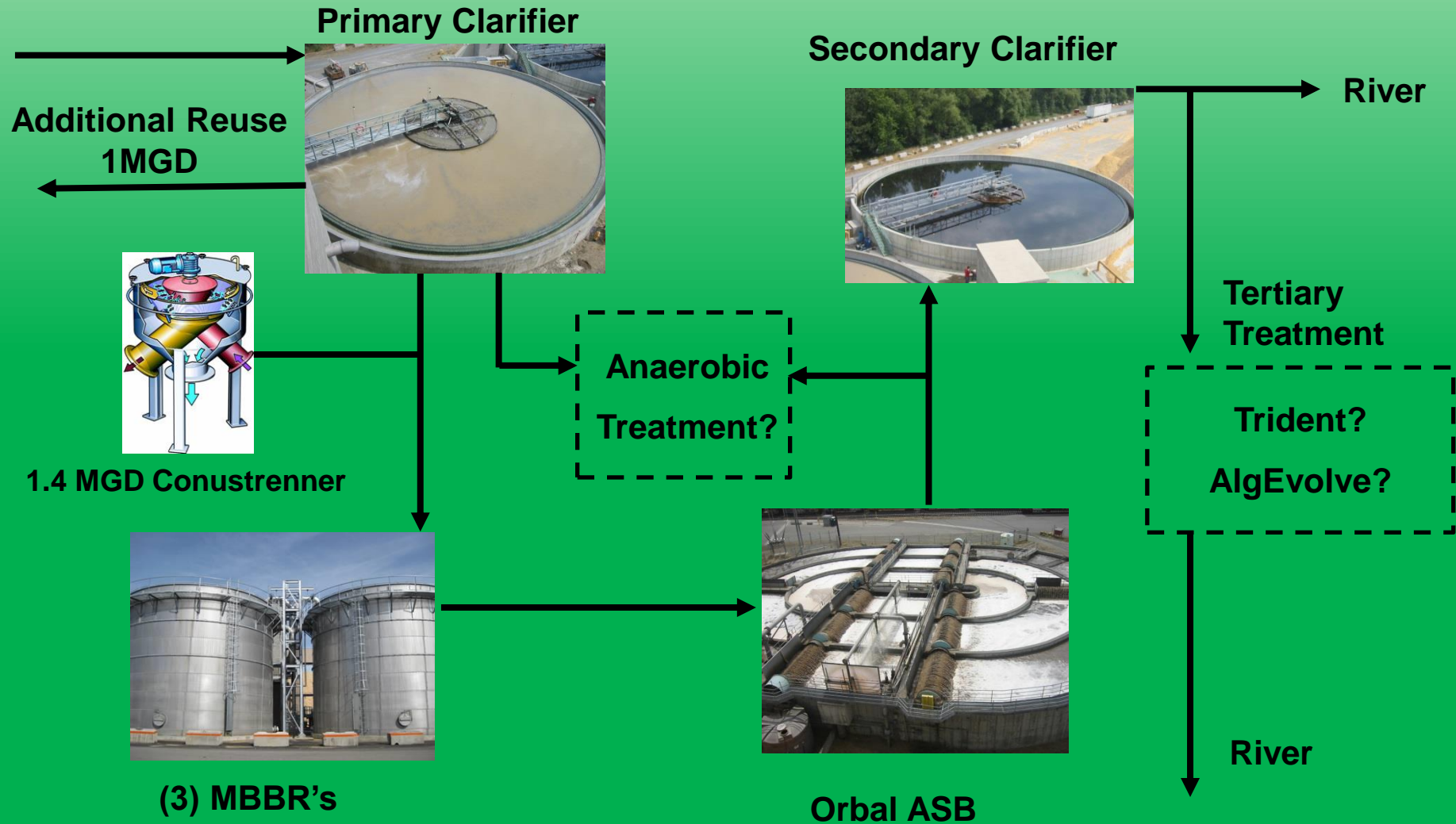


# Overview of Update

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- Overview of Wastewater Treatment System
  - Water Reclamation/Reuse
- Tertiary Treatment Options
  - Trident HS
  - AlgEvolve
- Summer Piloting
  - Membrane Systems
  - Harvesting Equipment
  - Trident Trials

# IEP's “*New & Improved*” WWTS

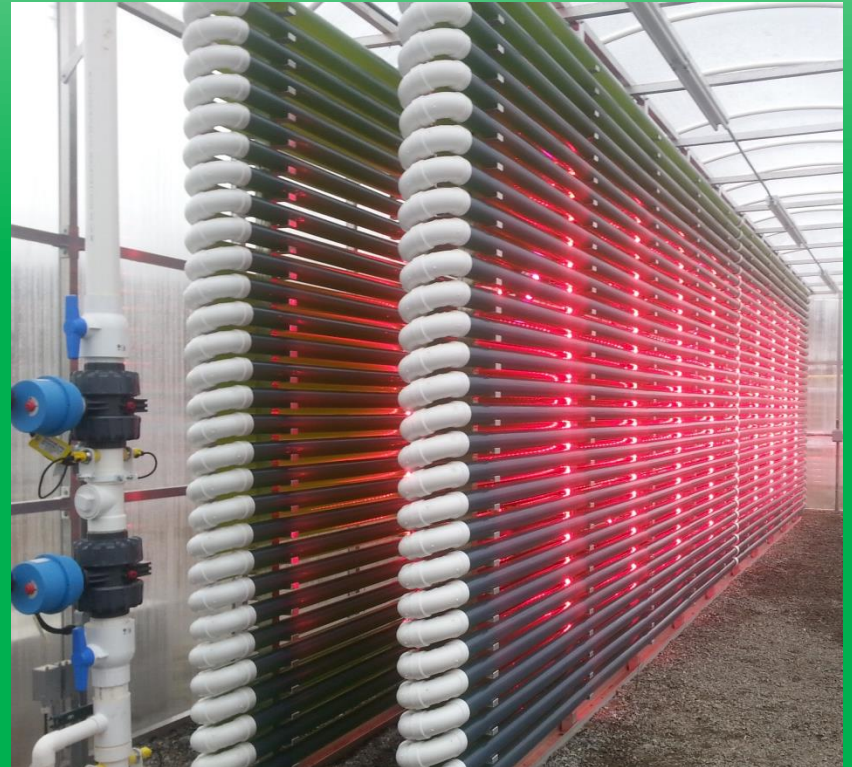


# Tertiary Treatment Options

Trident HS



AlgEvolve





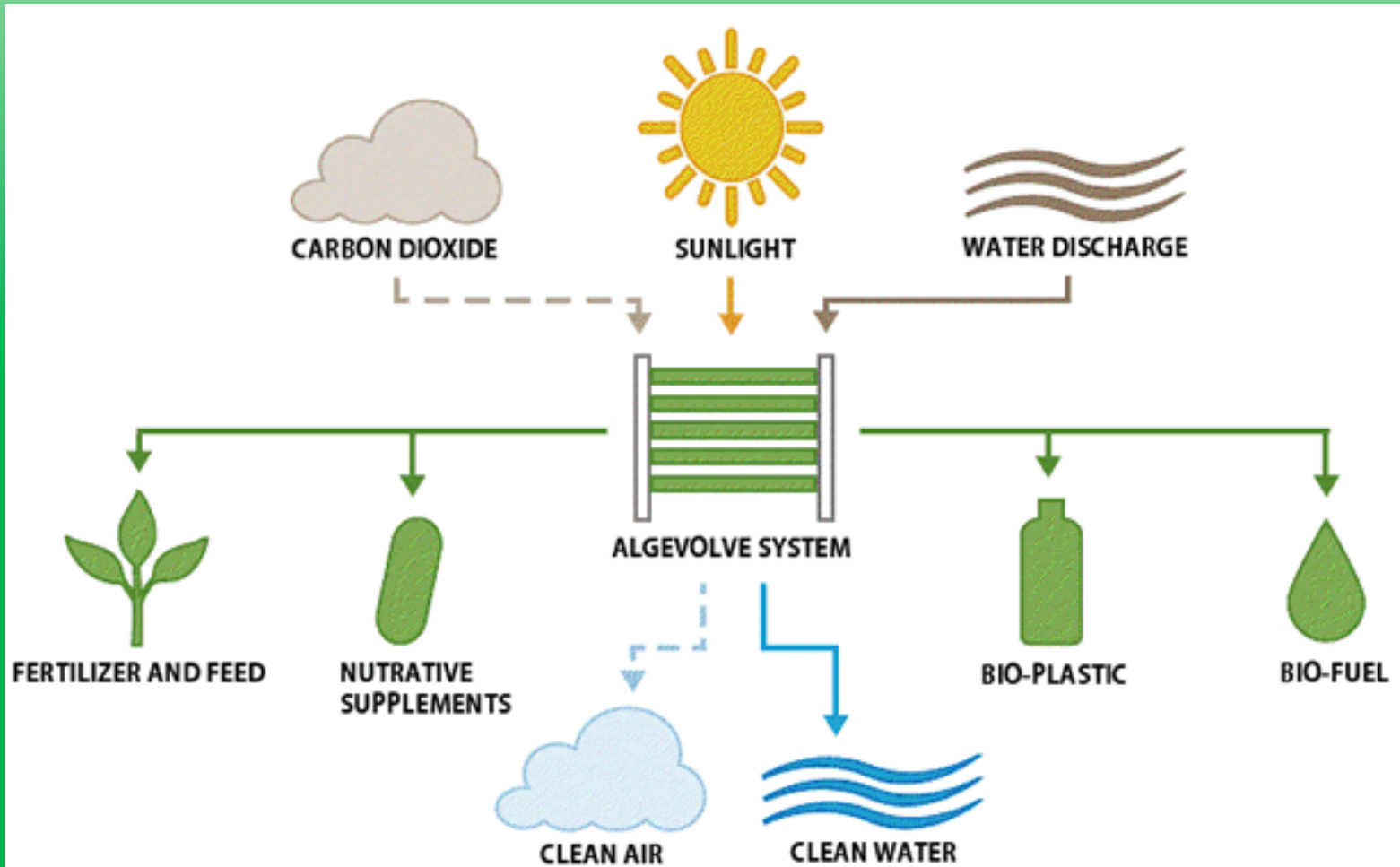
# Trident Troubles & Tribulations

- System Issues
  - Screen Issues
  - Rebuild
- Reject rate & Sludge
  - What to do with sludge?
  - Alum usage





# AlgEvolve Process





# Biological vs Chemical

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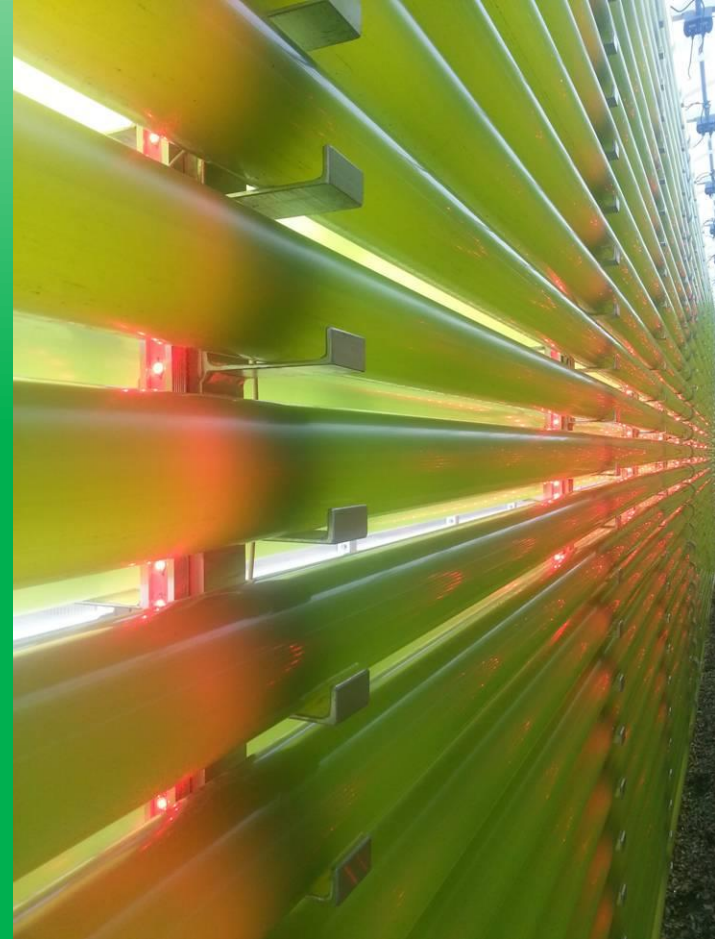
- Advantages of Algae-base Process over Chemical:
  - Not chemically intensive
  - CO<sub>2</sub> sequestration
  - Produces pure O<sub>2</sub> as by-product
  - Produces algae as a commodity by-product
  - Low energy
  - May provide additional benefits such as PCB removal
- Challenges:
  - Green field technology
  - Economics
  - Reliability
  - Optimization of biological and filtration processes

# AlgEvolve: Demo Scale System





# AlgEvolve: Photobioreactor



# AlgEvolve: Previous Membranes





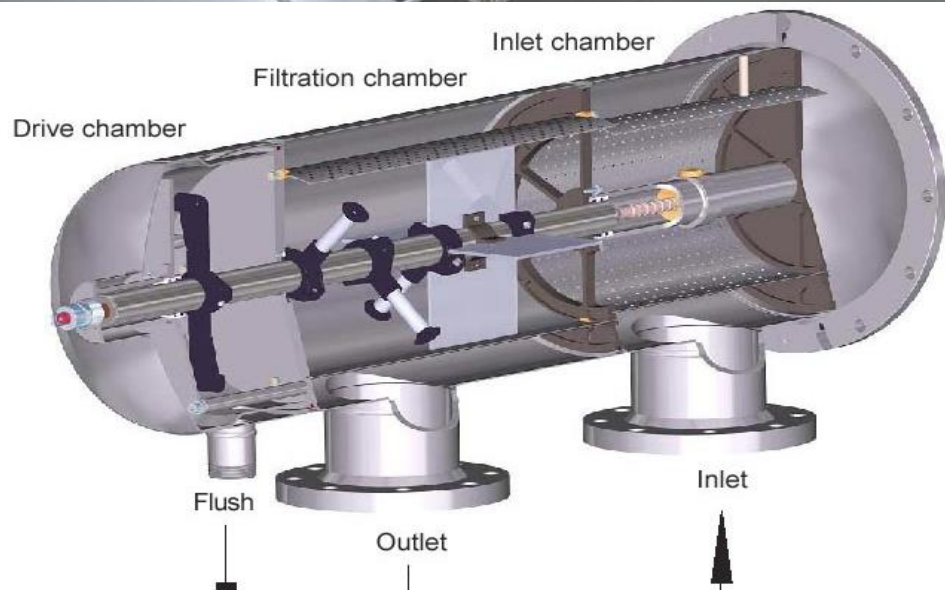
# AlgEvolve: Current Status

- Previous Membrane Issues
- Testing and Homework
  - Chemical Finger Printing
  - Bench testing
  - Membrane trials
- Prescreening
- Harvesting Equipment



# Summer Piloting

- Four Pilots
  - Koch
  - Ovivo/Microdyn Nadir
  - Membrane Specialists
  - Westec
- Harvesting Equipment
  - Chemical free process
  - Concentrates algae
- Prescreening
  - 100um, 50um





# Questions?

