Advanced Wastewater Treatment Plants

Delta Environmental Products™
Pentair Water

Agenda

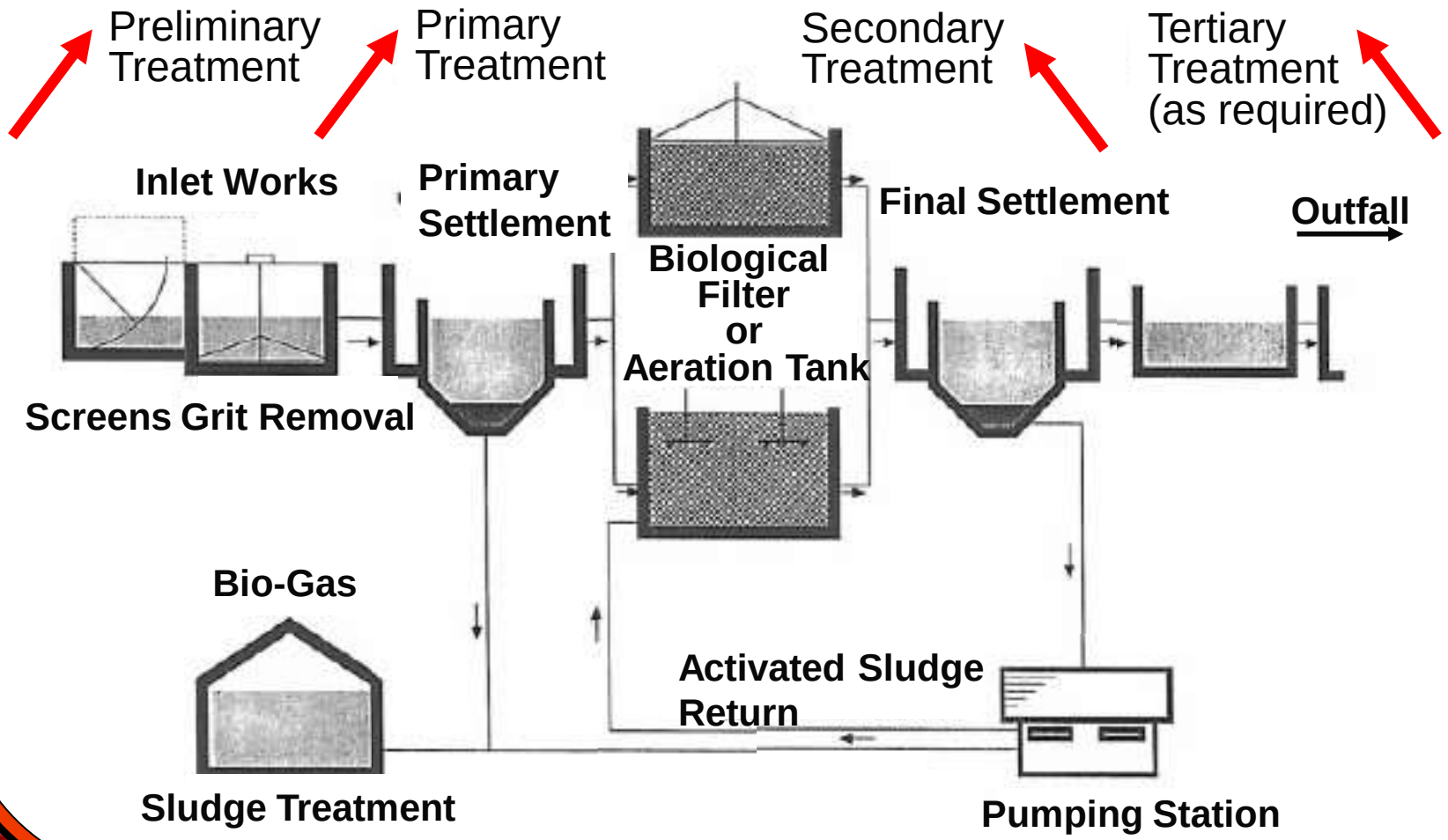
1. Conventional Wastewater Treatment Plant

2. Future Development in Wastewater Treatment Plant

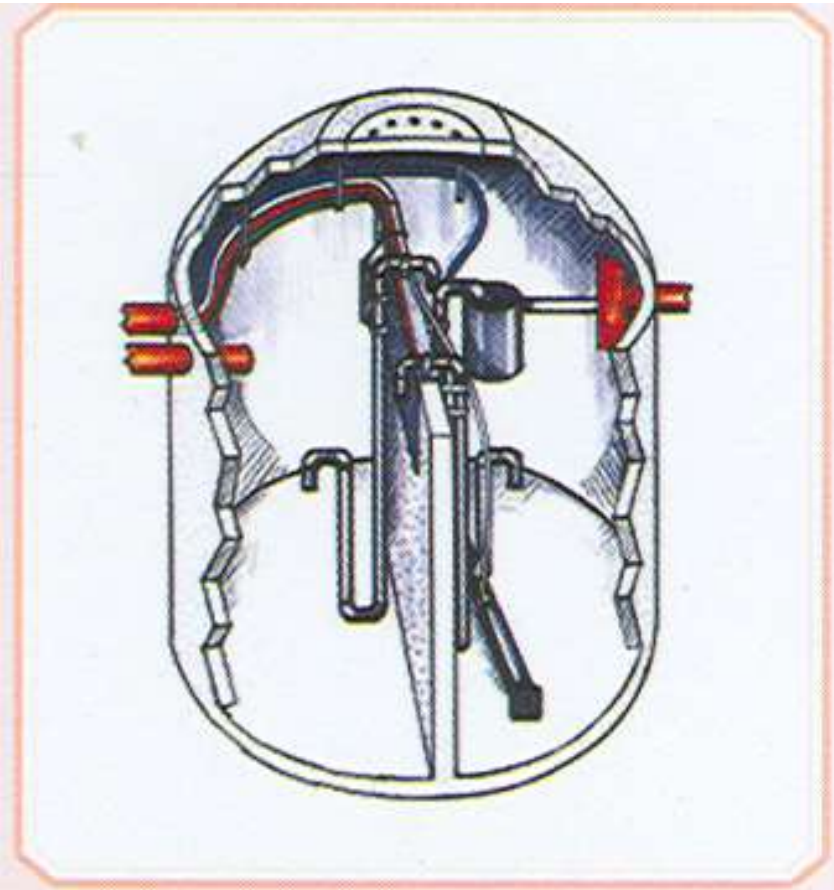
3. What are the problems created by wastewater ?

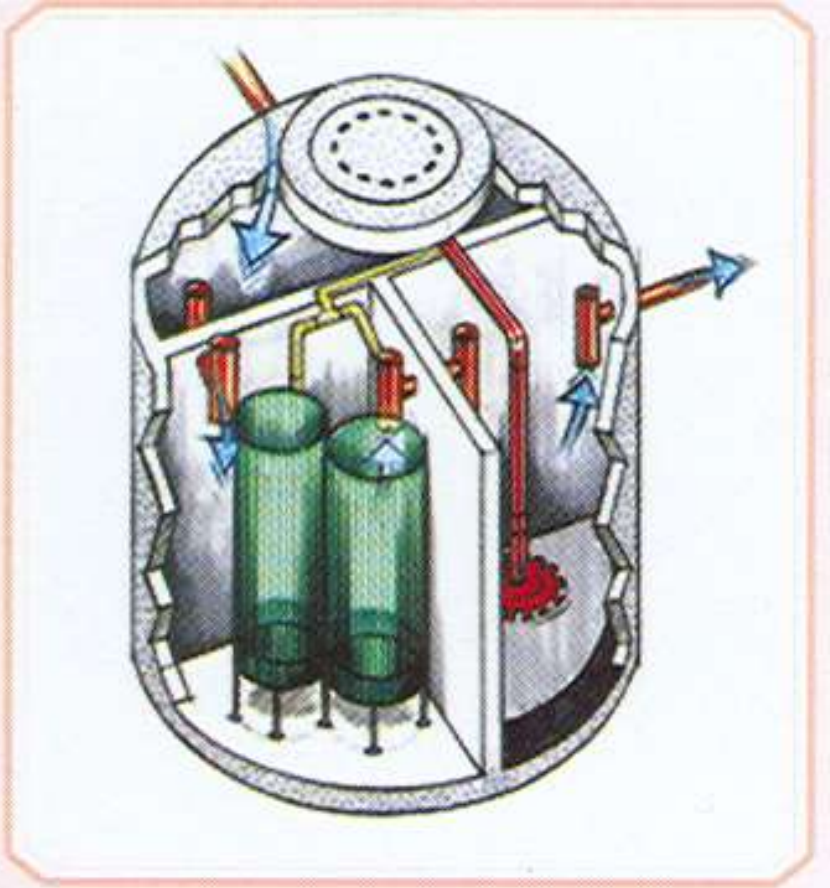
4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

1. Conventional Wastewater Treatment Plant

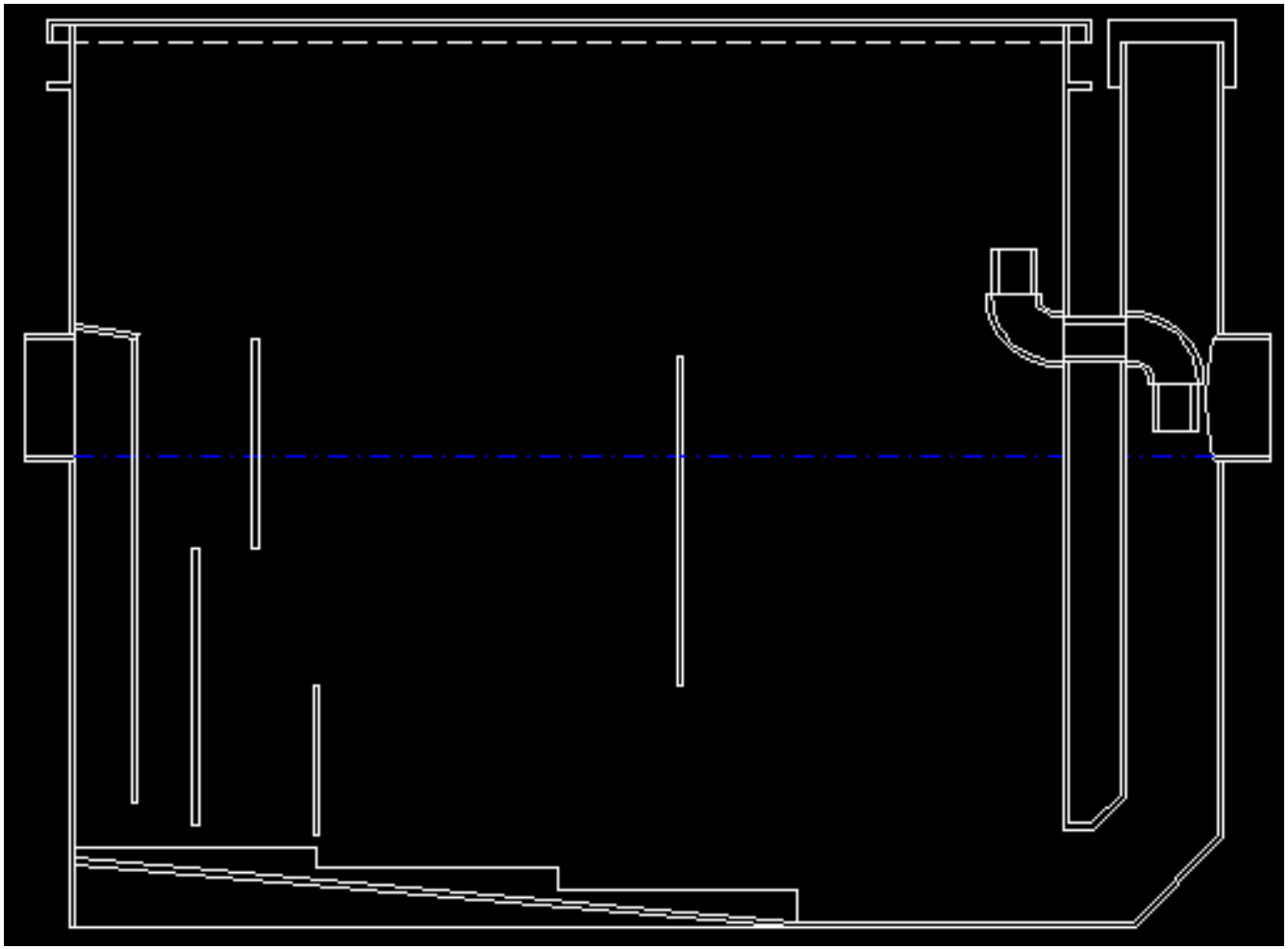


1. Conventional Wastewater Treatment Plant
Septic Tank

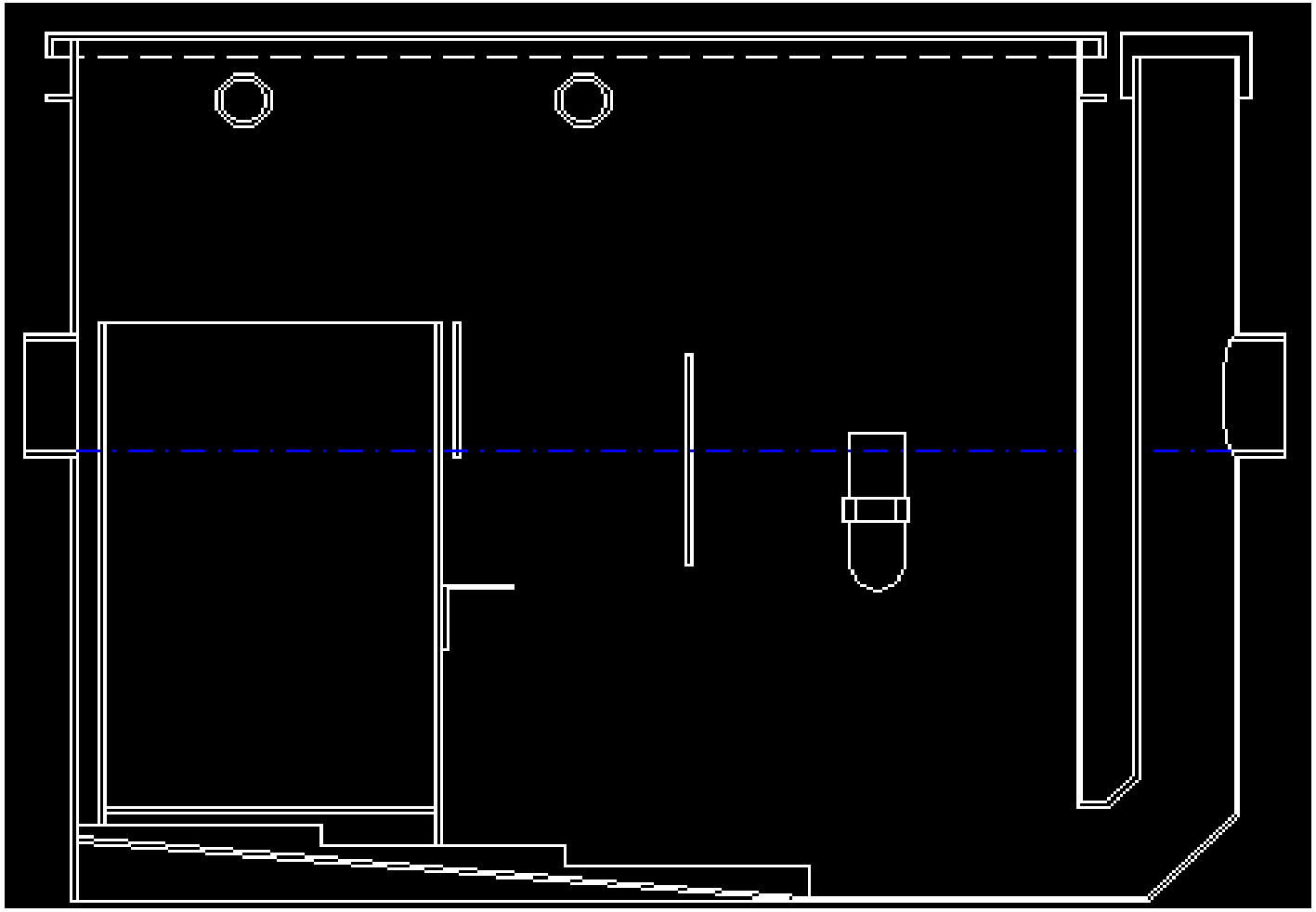




1. Conventional Wastewater Treatment Plant Grease Interceptors



1. Conventional Wastewater Treatment Plant Oil Interceptors



2. Future Development in Wastewater Treatment Plant

- In recent years the use of biological aerated filters (BAFs) and reed beds has developed.
- The BAF is a submerged fixed-film reactor into which air is bubbled.
- Also, the radiation pulse treatment is a new disinfection system and is successfully treated the sludge.
- Any new technologies and process improvements will be influenced by a variety of factors including climate, geography, and more importantly by the investment in existing assets.

2. Future Development in Wastewater Treatment Plant

- When limited areas of land are available in urban locations there will have to be a choice between pumping the wastewater inland to a conventional treatment works or constructing a covered urban installation.

Two specific developments are worthy of mention:

- 1. Use of membrane separation as an alternative to biological secondary treatment, followed by disinfection for coastal sites, and
- 2. Membrane bioreactor systems

3. What are the problems created by wastewater ?

- **1. Sewerage Systems Odors Control**

  Physical means and/or **Chemical means**

- **2. Disinfection**

  The purpose of disinfection is to selectively destroy disease-causing organisms.

- **3. Chemical Precipitation**

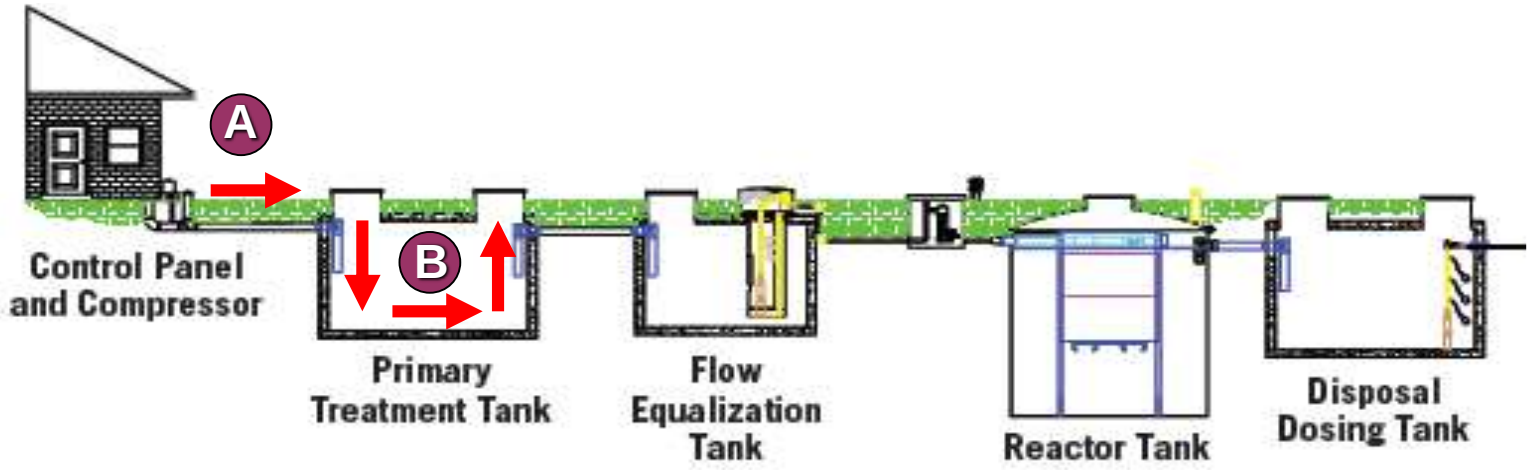
  Chemical precipitation is used to remove phosphorus and to enhance suspended-solids removal in sedimentation processes.

- **4. Adsorption**

  In wastewater treatment, adsorption, using granular activated carbon (GAC), is utilized to remove organics not removed and other chemical treatment processes.

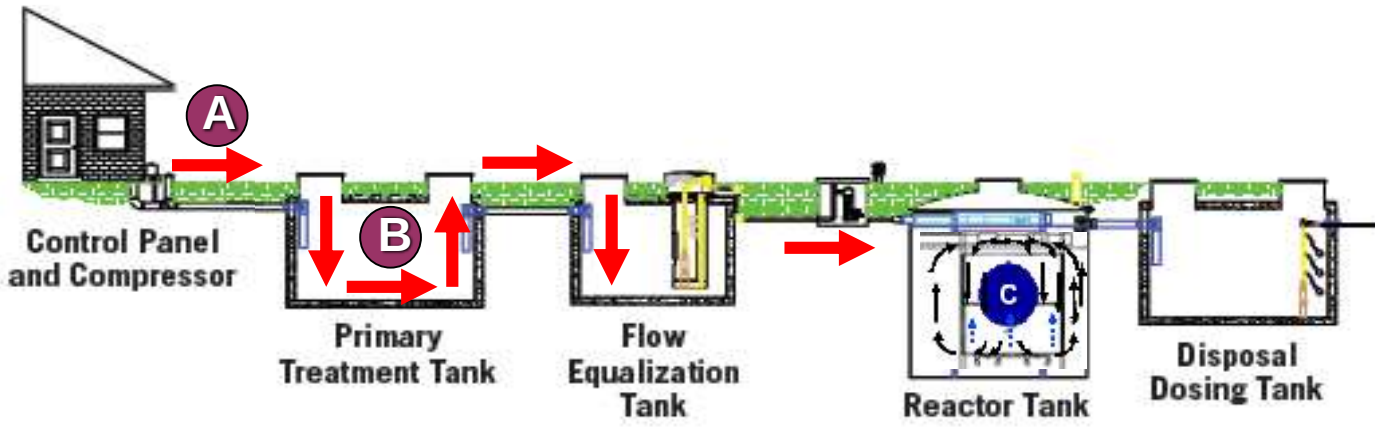
4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

- A. Wastewater enters the Primary Tank from facility/system
- B. Debris and setteable solids settle to the bottom of the primary Tank, where anaerobic decomposition begins



4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

- C. Wastewater enters the reactor chamber (BIOPOD) where it flows over the attached growth media. Aerobically-changed bacteria on the media digest the biodegradable waste, converting it to carbon dioxide and water. An external air compressor is used to feed air to the system for the aerobic bacteria.



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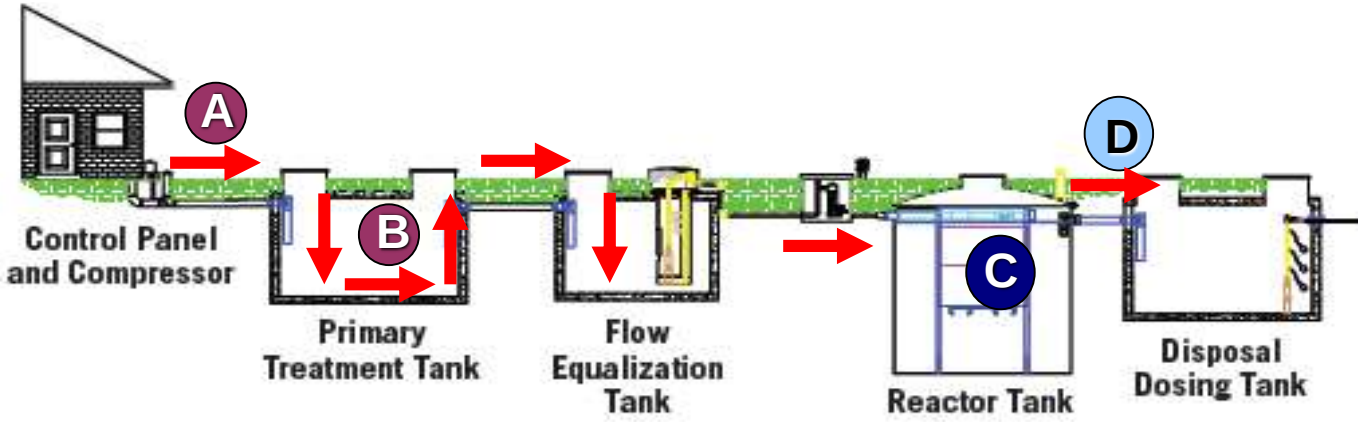
- D. Chemical effluent exits the tank to move to the disposal system.



4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Advantages of ECOPOD-C® system:

- Small commercial treatment plants
- Aerobic utilizing the attached growth process
- Low initial cost and capital cost
- Minimum routine maintenance
- Can be used in conjunction with:
  - Direct surface discharge
  - Spray irrigation
  - Leaching chamber system
  - Low pressure pipe systems
  - Conventional drain fields

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Advantages of ECOPOD-C® system:

- No air diffuser required
- Low sludge production
  - No sludge return operation
  - No rising sludge
  - No external clarifier required
- Modular units can be shut down during times of low usage in order to save energy
- Simpler and less expensive to operate than competitor options

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Model Capacity (gallons per /day /m^3/day)

- E200/1 2,000/7.6
- E200/2 4,000/15.2
- E200/3 6,000/22.7
- E200/4 8,000/30.3
- E200/5 10,000/37.9

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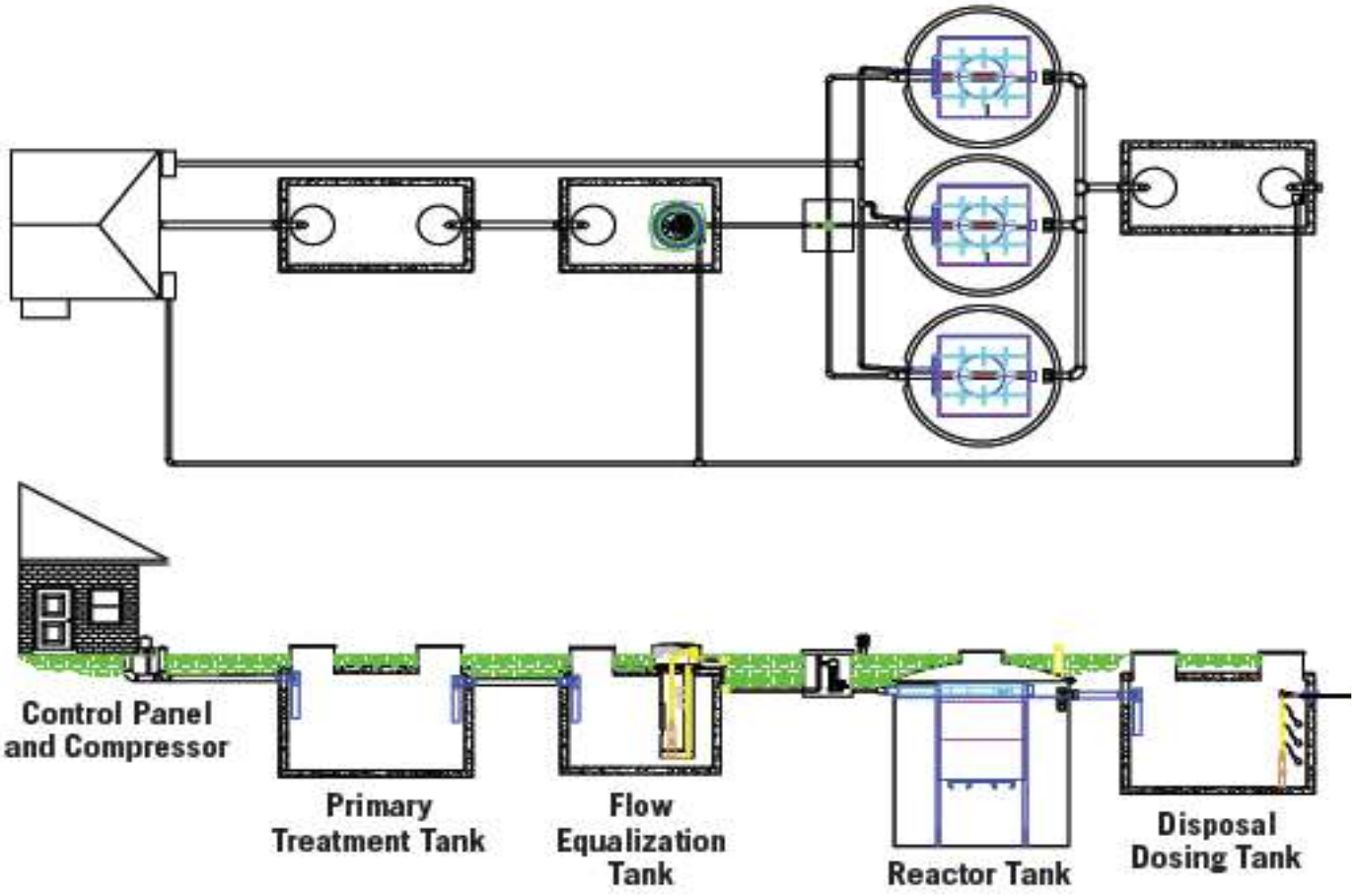

E200/3 6,000 gallons per day capacity

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Typical Treated Water Quality

- 5 day Biochemical Oxygen Demand (BOD5)

  6 mg/l (Conventional system 20 mg/l)
- Total Suspended Solids (TSS)

  8 mg/l (Conventional System 30 mg/l)
- Ammonia nitrogen is one of the contaminants. Wastewater nitrification of the ammonia and de nitrification of nitrates occur within the bacteria masses.
- A 60%+ removal rate of total nitrogen is common without any type of recirculation or cycling of the blower.

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

ECOPOD-C® System Features

- Sizes to meet daily flow requirements
- Furnished with fiberglass housings
- All the components of the treatment system are included except primary tank, flow equalization tanks, and dosing pumps.
- Units are modular – increased flow rates require only additional treatments pods in parallel
- Optional UV treatment is available

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

ECOPOD-C® Easy to Maintain

- Ensure all mechanical and electrical components (air compressor and control panel) remain operative.
- Keep air filters, screens, air intakes and vents clean.
- Check sludge level in the bottom of the reactor chamber and clean out as necessary.

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Raw Water **Aeration Tank** **Effluent Water**

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

In Singapore Membranes are Being Used to Produce Potable Water from Wastewater

4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

NEW Advanced Wastewater Treatment System

- Exceptional, High Quality Effluent
- Minimal Sludge Production
- Flow ranges of 3,000 (11.4 m^3/d) -500,000 (1,893 m^3/d) + gpd
- Operator Friendly
- Requires small foot print area
- Residential & Commercial Applications
- Modular Design
- Skid mounted, movable components

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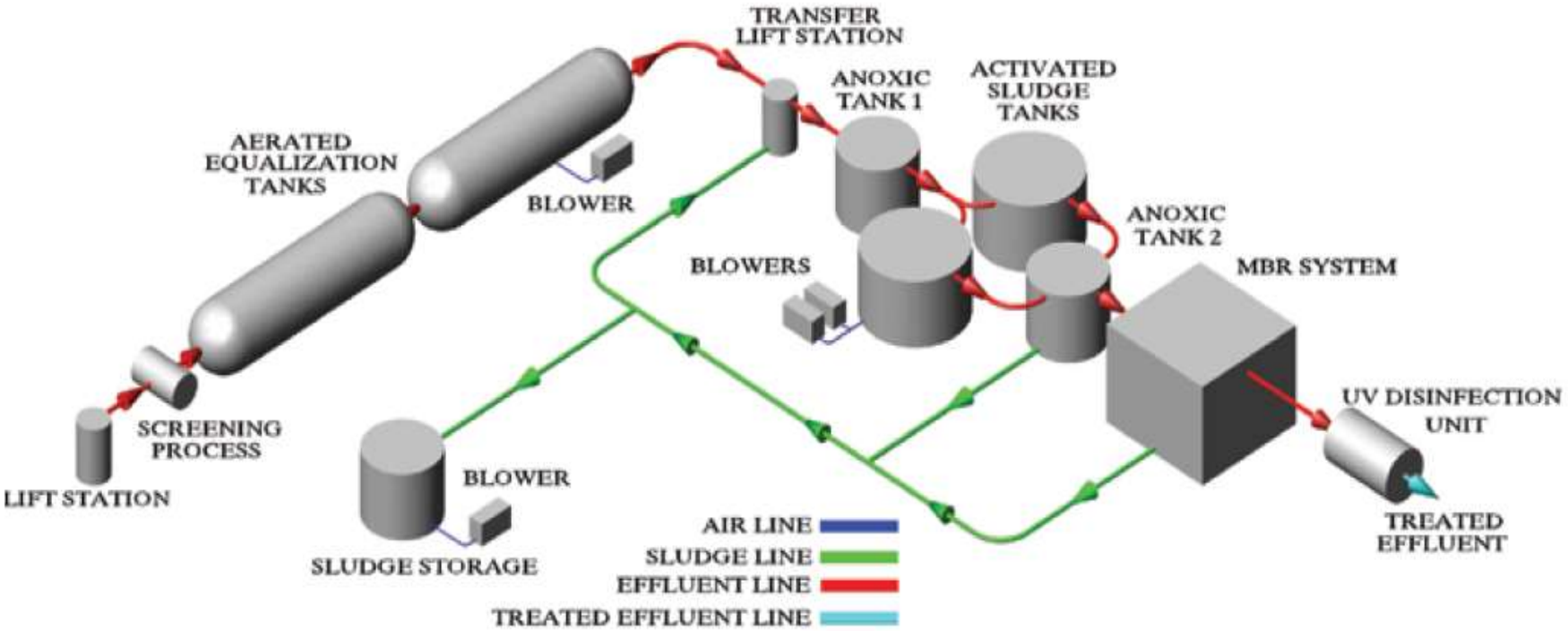
NEW Advanced Wastewater Treatment System



4. Why Use ECOPOD-C® Advanced Wastewater Treatment Plant?

Application Areas

- Chemical processing
- Food processing
- Refining and petrochemical
- Textile
- Mining
- Pulp and paper
- Cheese plants
- Resorts
- New Development Areas

Any Questions

THANK YOU

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