

Aerobic Treatment Units



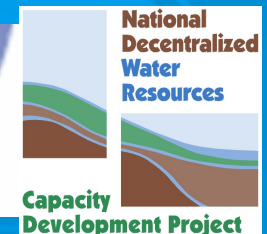
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ATU Treatment

- Remove substantial amounts of BOD and TSS
 - Nitrification of ammonia
 - Reduction of pathogenic organisms
 - Not Sterilized
 - May have denitrification as a component
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Components

- Trash tank
 - Trash Removal/Anaerobic Treatment
- Aerobic Treatment
 - Mixing of the Food & Bacteria
 - F/M ratio
- Air Supply
- Clarification
- Sludge Return

Operation and Maintenance

Form 7.2 Operational Checklist: Aerobic Treatment Unit (ATU)

- Your manufacturer may have a specific form
 - This will be covered in ATU specific training.

1. Type of ATU

- Suspended growth
 - Submerged attached growth/Fixed film media
 - Combination attached/Suspended growth
 - Sequencing batch reactor
 - Rotating biological contactor
- Manufacturer: _____

2. Conditions at the ATU

a. Evaluate the presence of odor within 10 feet of perimeter of system:

- None
- Mild
- Strong
- Chemical
- Sour

b. Source of odor?



2. Conditions at the ATU (cont.)

c. Was Foam/Residue observed outside of the unit?



3. ATU access

- a. Locate at grade
- b. If no, how deep is lid buried



Too Deep



Lid slightly buried

3. ATU access (cont.)

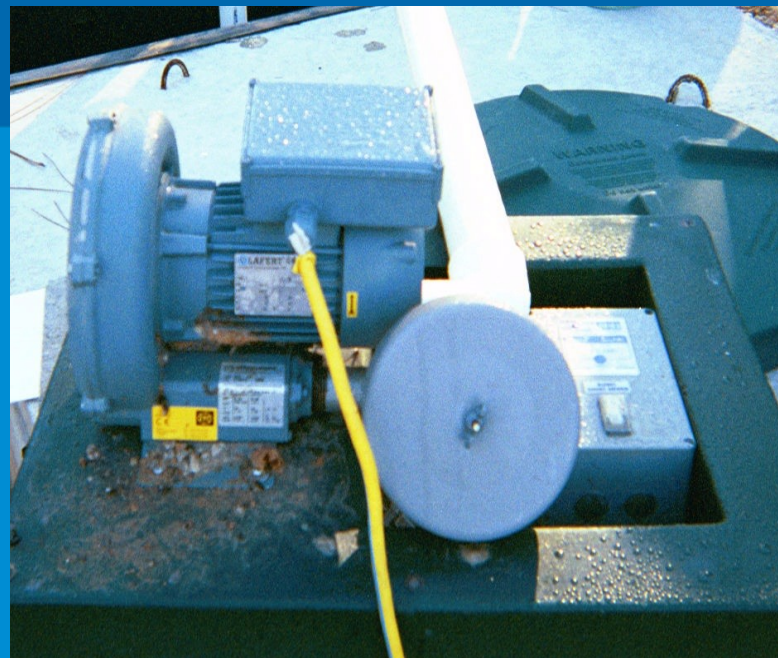
- c. Risers on tanks
- d. Evidence of infiltration in the risers
- e. Lids securely fastened
- f. Lids in operable condition



4. Venting/Air supply

a. Air supply method:

- Aspirator
- Aerator
- Compressor
- Blower



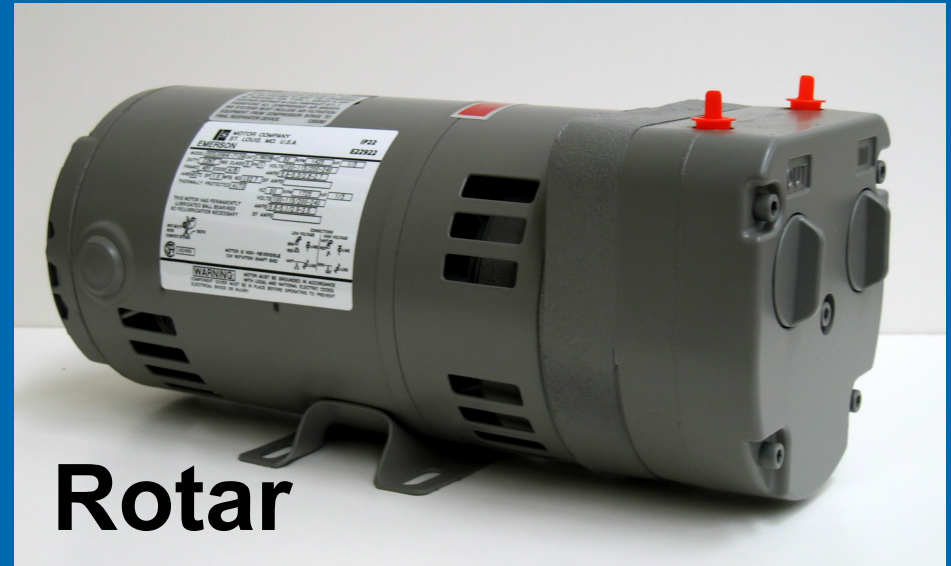
Aspirator/Aerator

- Vacuum pulls air into the water
- Spinning shaft or impeller causes the vacuum
- Check air flow
- Remove aerator
- Clean shaft



Compressors

- Greater pressure
- Lower air flow
- Two distinct types of compressors
 - Rotary
 - Linear
- Listen for operation
- Check operating pressure
- Clean Filters
- Rebuild as necessary



Rotar

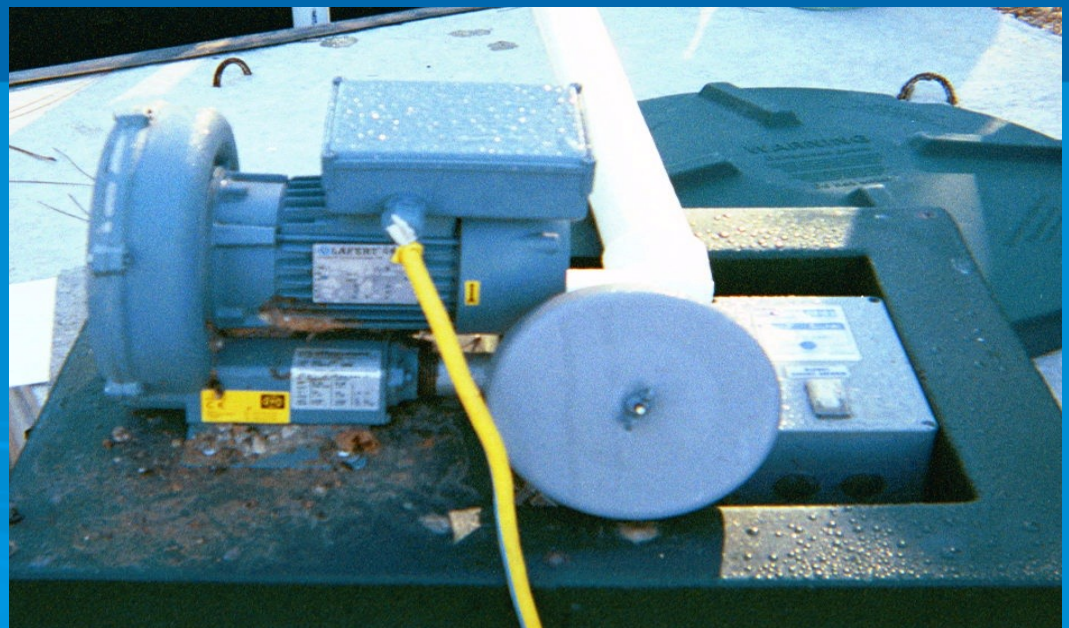


Linea

r

Blowers

- Greater air flow
- Lower pressure
- Check inlet screens/filters
- Air flow discharge from unit



4. Venting/Air supply (cont.)

- b. Operation:
 - Continuous
 - Timed

- c. Air supply unit operating properly?



Air Dispersion



Perforated Pipe



Porous Stone Diffuser

- Introduces air into the water
- Supply lines
- Dispersion methods
 - Holes
 - Slots
 - Porous material
- Potential for plugging in the orifices that could reduce air flow

4. Venting/Air supply (cont.)

d. Pressure at air supply unit:

Where

Measured at the unit

Pressure gage

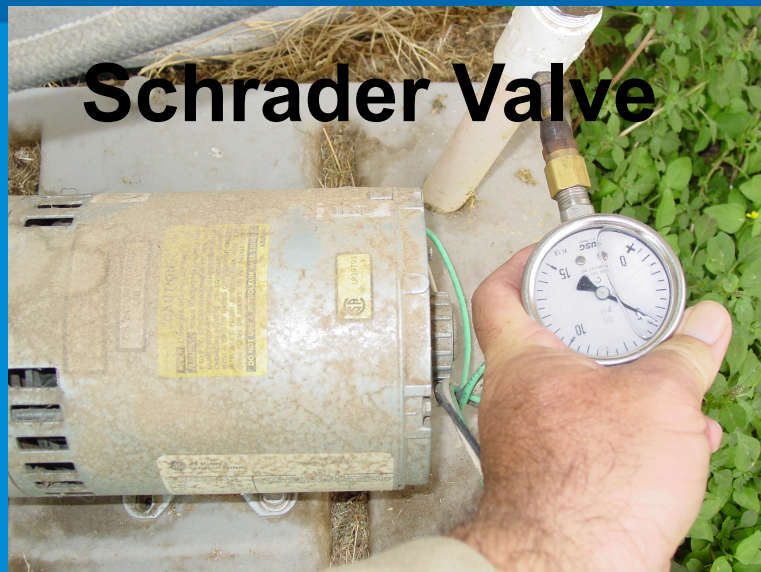
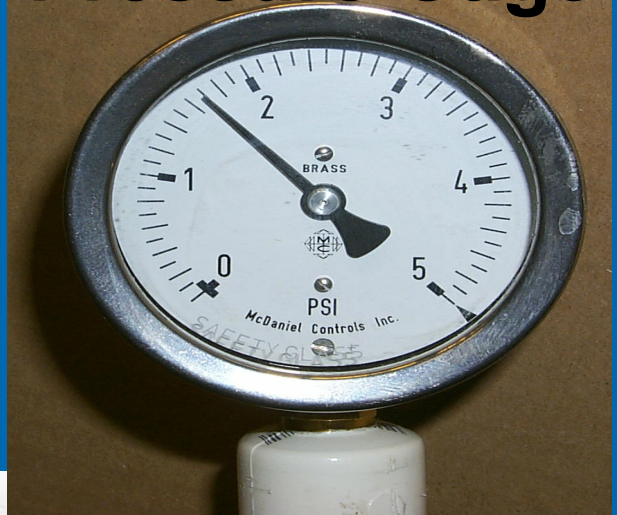
Schrader valve

What should it be?

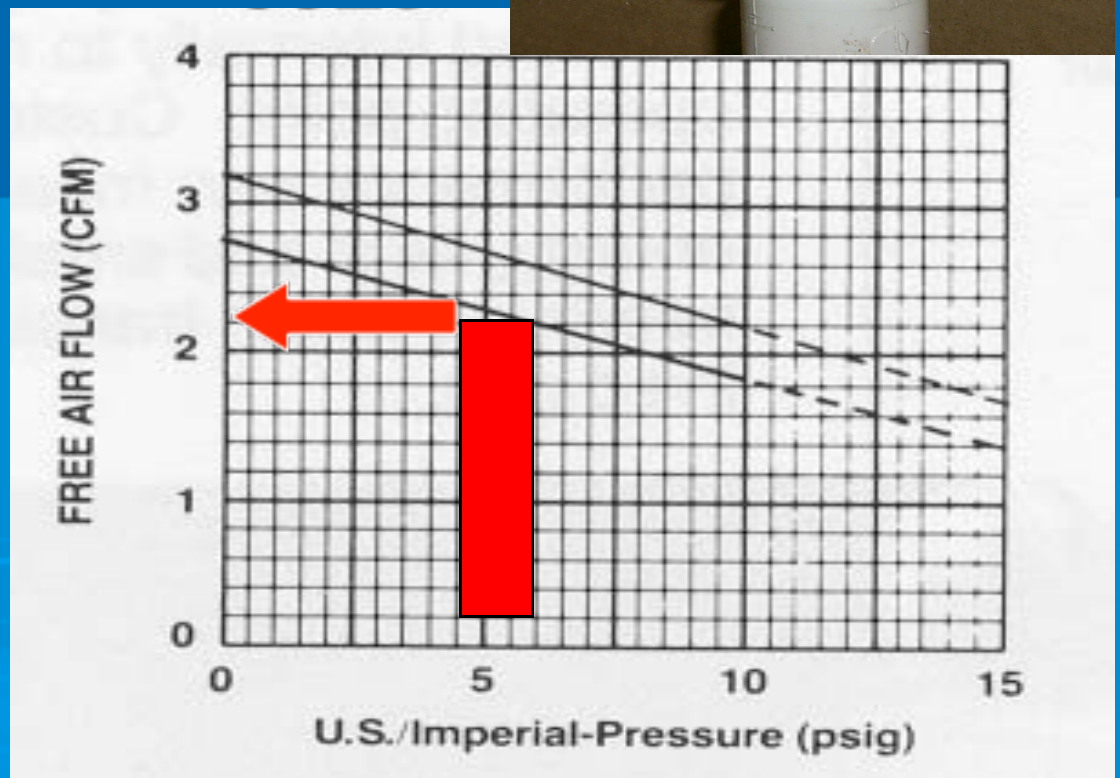
Flow pressure curve

How to read it

Pressure Gage



Schrader Valve



Venting/Air supply (cont.)

e. Air flow at air supply unit:

Measured at the supply unit

Positive pressure

Compressor

Blower

Vacuum

Aspirator



4. Venting/Air supply (cont.)

f. Air filter/screen:

Cleaned

Washed/Dried

Replaced

Every Time

Yearly

Filter Locations

Internal

External



4. Venting/Air supply (cont.)

g. Venting appears operable

Air entering system
Air must exit
somewhere
Unit
House vent
Biofilter



5. Aeration chamber

a. Mixing in aeration chamber

- Rolling motion

b. DO in aeration chamber

- 2 mg/L

c. pH in aeration chamber

- 7.0

d. Temperature in aeration chamber

- Room temperature

➤ Collect sample from aeration chamber

- Measure items



5. Aeration chamber (cont.)

e. Settability test

➤ 30 Minute Settleability Test

- Beaker with 10 even gradations
- Fill beaker with sample from aeration chamber.
- Let stand for 30 minutes and read level of clear zone.

➤ Generally, 20% to 60% is ok.

- This will be ATU specific



5. Aeration chamber (cont.)

f. Biomass color in aeration chamber

- Clear
- Brown
- Black

g. Sludge pumping recommended



6. Additional tasks for attached growth- media evaluation

a. Plugging

b. Floating

c. Media washed

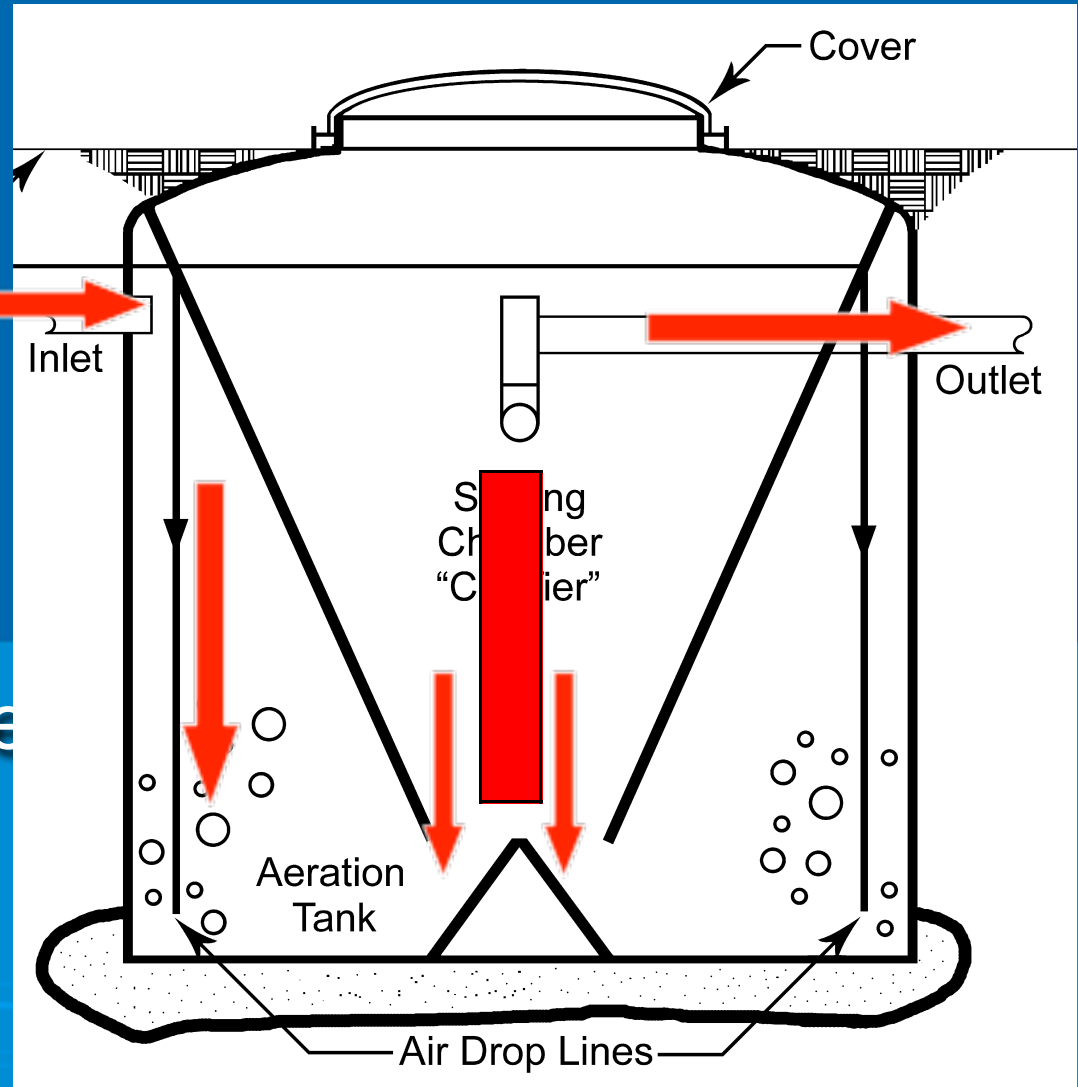
- Air
- Water

d. Media replaced



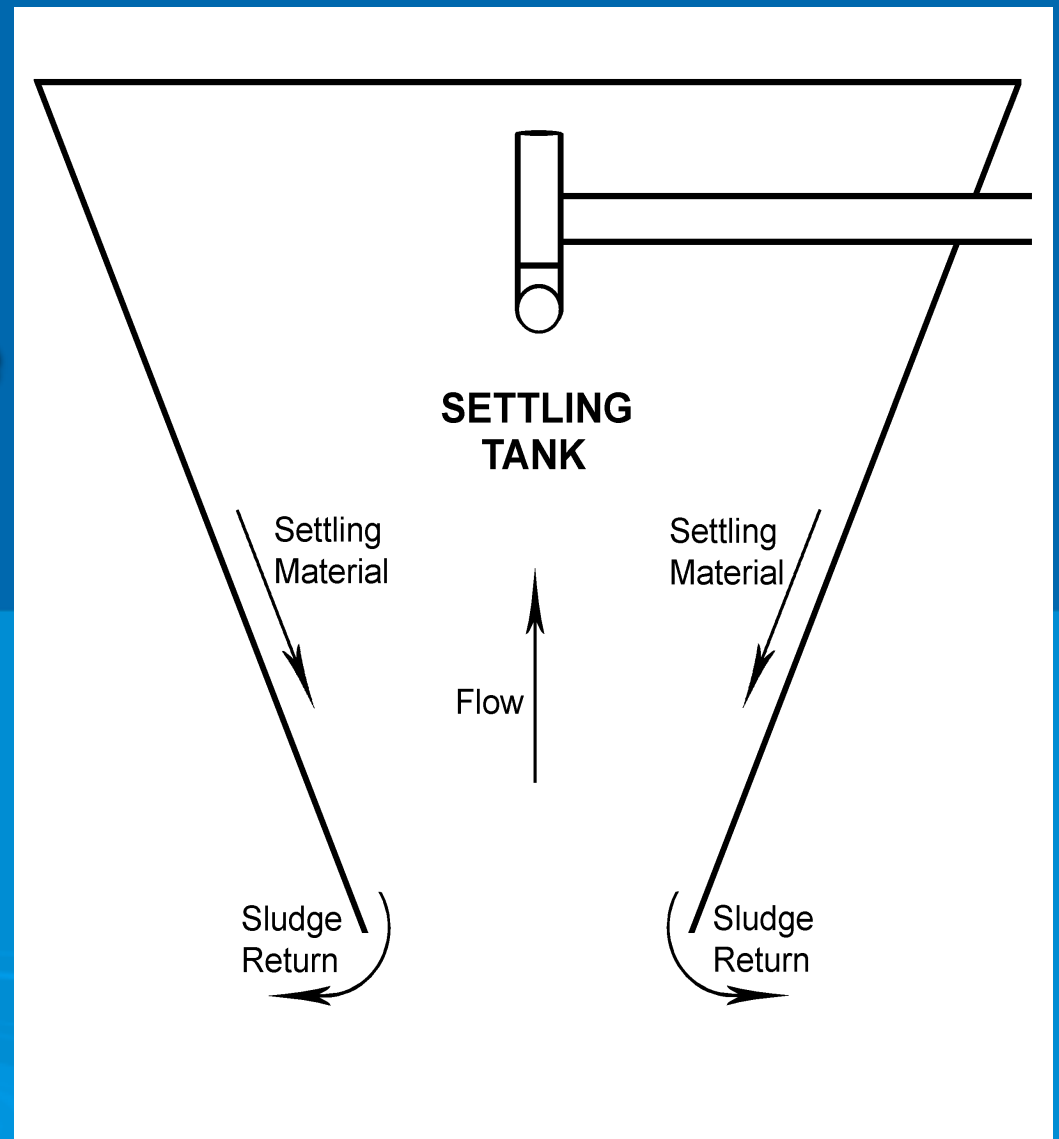
7. Clarification chamber

- Process occurs in a “clarifier”
- Clarification is the process where the microbes, cell waste and biomass settle out of the water.
- Sludge blanket in the bottom and a clear zone below the discharge point



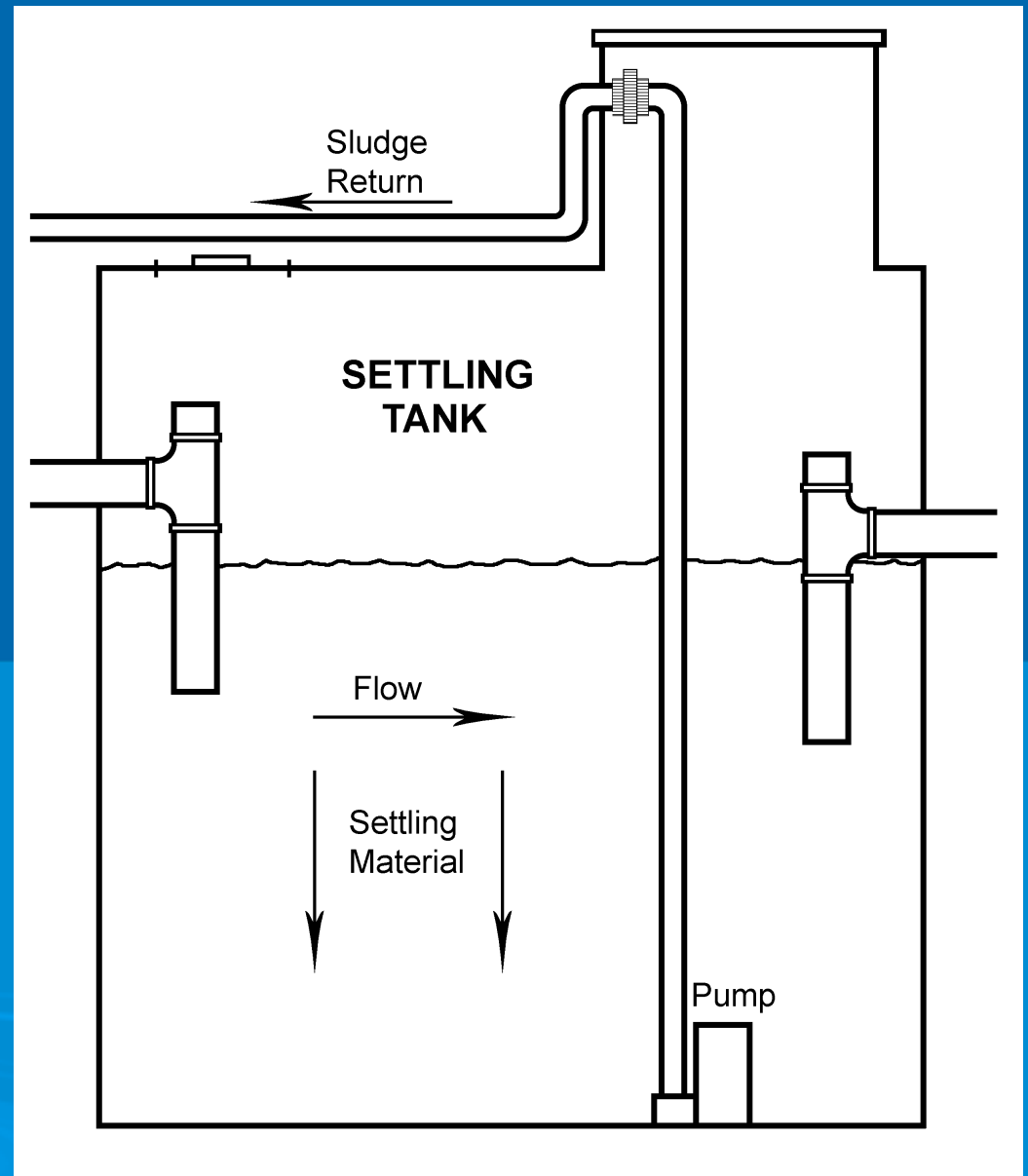
Vertical Settling Chamber

- Flow is vertical through the chamber
- Upward flow rate must be less than the settling rate



Horizontal Settling Chamber

- Flow is horizontal through the chamber
- Particles must settle below flow line



7. Clarification chamber (cont.)

- a. Scum Layer
- b. Clear zone depth below outlet
- c. Effluent screen/tertiary filter cleaned
- d. DO in clarifier
- e. pH in clarifier



7. Clarification chamber (cont.)

f. Temperature in clarifier

g. Effluent odor after passing through unit:

None

Mild

Strong

h. Effluent color after passing through unit:

Clear

Brown

Black

i. Effluent turbidity



8. Sludge return operating



- Settled solids passing into a previous treatment chamber
- Passive system
 - Settled solids passing through the bottom opening
- Active system
 - Settled solids blanket below the outlet baffle

8. Sludge return operating (cont.)

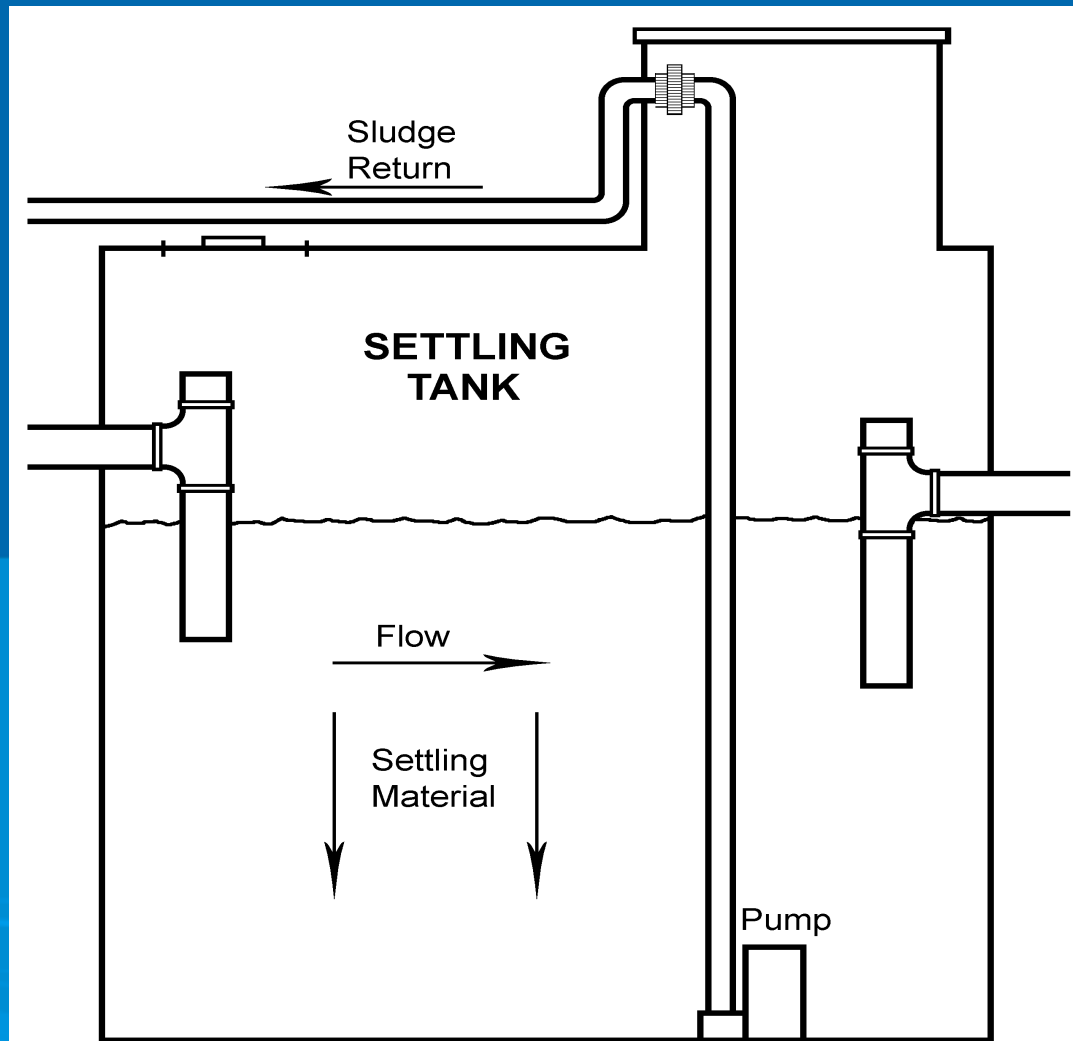
Note method for sludge return

Passive

Active

a. If active, pump was checked manually

b. Pump operating properly



9. Control panel

- a. Controls operating properly
- b. Is enclosure watertight
- c. Alarm test switch operating properly



9. Control panel (cont.)

d. At time of inspection,
control switch was
set to:

➤ N.A.

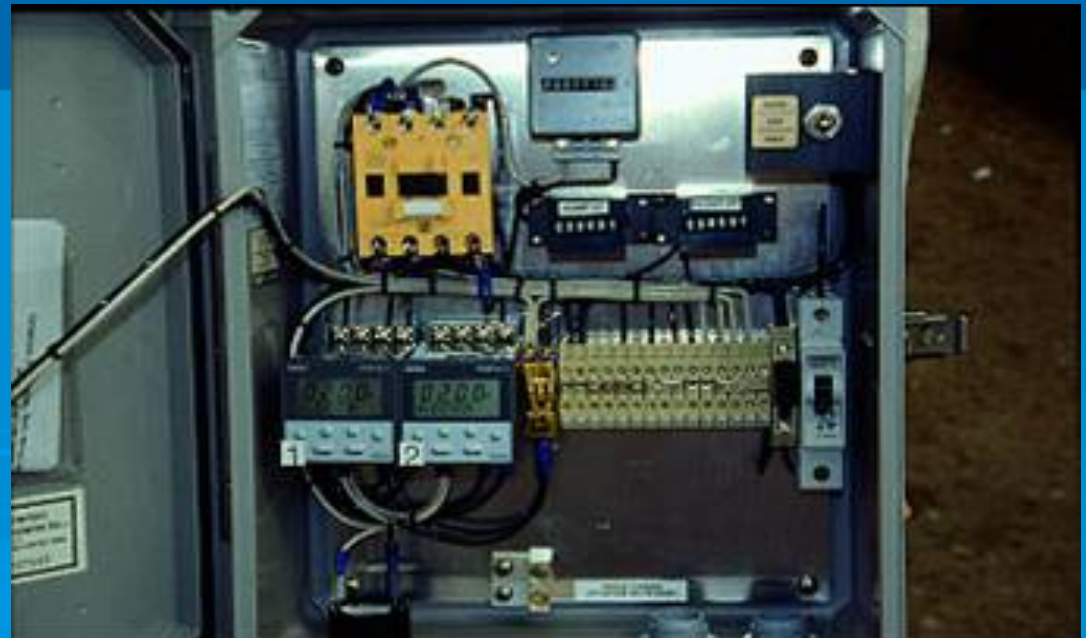
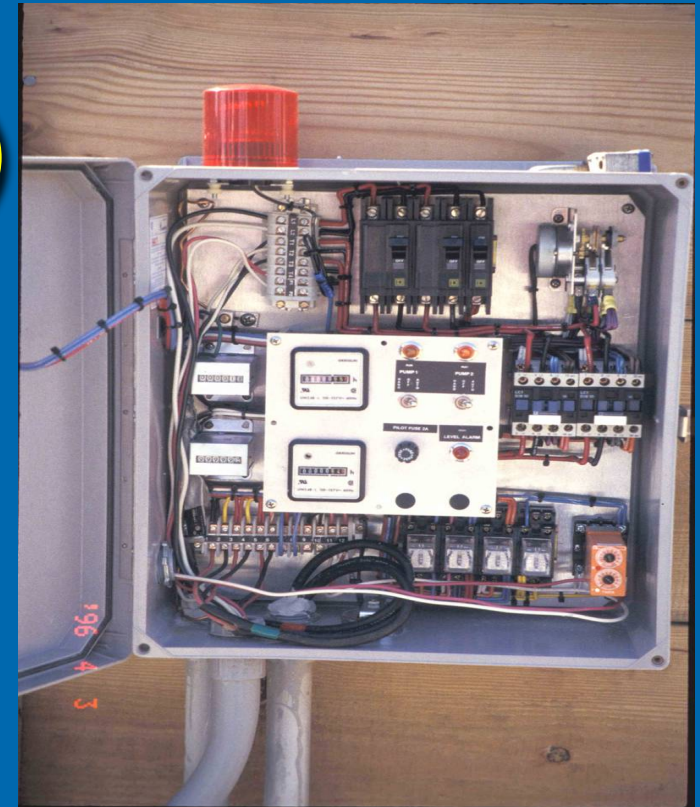
➤ Hand/Manual

➤ Auto

e. If auto, setting:

➤ Time on (min)

➤ Time off (min)



10. Alarm(s)

a. Alarm(s) present

Types:

- High water
- Air pressure
- Remote

b. Alarms operating

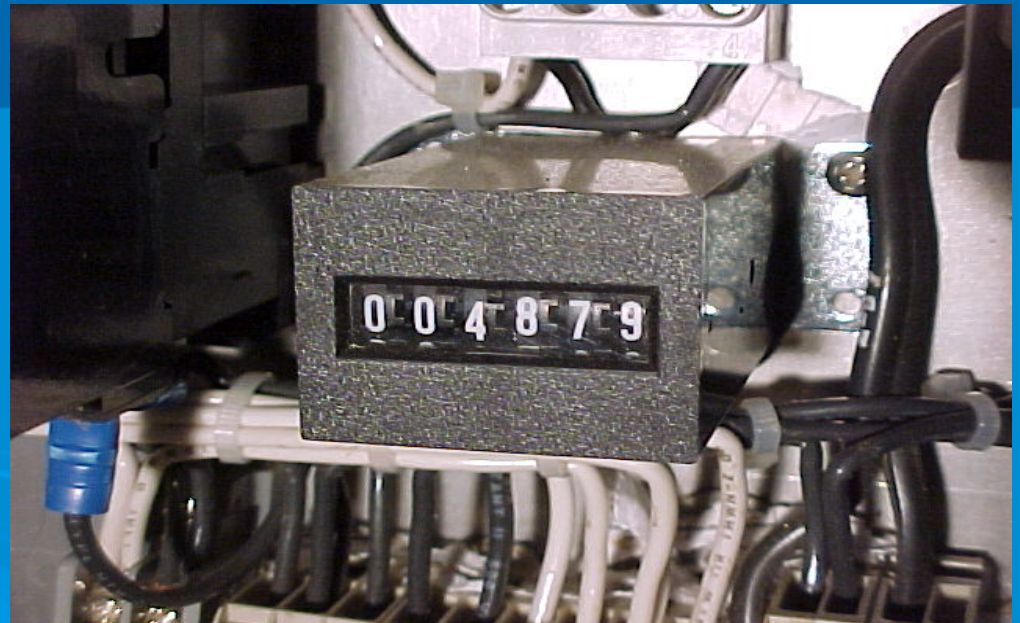
c. Alarm readings

i. Elapsed time meter

ii. Cycle counter

d. Battery backup charged

e. Telemetry operational



11. Manufacturer's required maintenance performed

- Generally manufacturers have specified maintenance for their proprietary products.
- Check with the manufacturer of the specific product for additional activities.
- Perform the additional specified operation and maintenance procedures.
- Document performance of the activities.
- ***Be sure to utilize only approved replacement parts.***

12. Lab samples collected for monitoring

- Constituent monitoring
 - Regulatory requirements
 - Manufacturer requirements
 - Designer O&M requirements
- Collect, transport and store samples using standard procedures.
- Utilize approved laboratory for sample analysis
- Report information to proper entities

Reporting Requirements

- Copies of your report to:
 - Owner (now ME) - Original
 - Health Department
 - Manufacturer
 - FOWA
- System failures must be reported ASAP
- Check regulations for requirements

Questions?

