



Minnesota  
Pollution  
Control  
Agency

Water Quality

Wastewater  
Technical  
Review and  
Guidance

# AEROBIC SLUDGE DIGESTION – REVIEW CHECKLIST

Water/Wastewater/#5.02, May 2001

FACILITY NAME

DATE

CONSULTING ENGINEER

SITE INSPECTION (DATE & INSPECTOR)

PLANNING OR DESIGN PHASE

## General

The aerobic sludge digestion system shall include provisions for digestion supernatant separation, sludge concentration, and any necessary sludge storage. These provisions may be accomplished by separate tanks or processes, or in the digestion tanks.

To achieve PSRP sludge, sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for mean cell residence time and temperature shall be between 40 days at 20°C and 60 days at 15°C.

Vector attraction reduction requirements of section 503.33 of federal regulation should also be met.

Influent sludge characteristics:

a) Primary, secondary, waste activated or combination

b) Solids concentration

%

c) Sludge flow per day

gal/day

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## Multiple Units

Multiple digestion units capable of independent operation are desirable and shall be provided in all plants where the design average flow exceeds 100,000 gallons per day. All plants not having multiple units shall provide alternate sludge handling and disposal methods.

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Average flow to plant \_\_\_\_\_ gal/day

Volatile Suspended Solids (VSS) loading  
(less than 0.1 lbs VSS/C.F/day) \_\_\_\_\_

No. of units? \_\_\_\_\_

If only one unit, Is an alternate sludge handling and disposal  
provided? \_\_\_\_\_

Indicate alternate sludge handling/disposal method \_\_\_\_\_

### **Tank Capacity**

The digestion tank capacities should be based on a solids concentration of 2 percent with supernatant separation performed in a separate tank. If supernatant separation is performed in the digestion tank, a minimum of 25 percent additional volume is required. These capacities shall be provided unless sludge thickening facilities are utilized to thicken the feed solids concentration to greater than 2 percent. If such thickening is provided, the digestion volume may be decreased proportionally.

a) Dimensions \_\_\_\_\_

b) Volume \_\_\_\_\_

c) Temperature \_\_\_\_\_

d) Solids Retention Time \_\_\_\_\_

### **Mixing**

Aerobic digesters shall be provided with mixing equipment which can maintain solids in suspension and insure complete mixing of the digester content.

Total Air Capacity for Mixing  
(0.75 to 1.5 hp/1000 ft<sup>3</sup>) \_\_\_\_\_

### **Air Requirements**

Sufficient air shall be provided to keep the solids in suspension and maintain dissolved oxygen between 1 and 2 milligrams per liter (mg/l). For minimum mixing and oxygen requirements, an air supply of 30 cfm per 1000 cubic feet of tank volume shall be provided with the largest blower out of service. If diffusers are used, the nonclog type is recommended, and they should be designed to permit continuity of service. If mechanical turbine aerators are utilized, at least two turbine aerators per tank shall be provided to permit continuity of service. Mechanical aerators are not recommended for use in aerobic digesters where freezing conditions will cause ice build-up on the aerators and support structures.



- 1) Type \_\_\_\_\_
- 2) Number of blowers \_\_\_\_\_
- 3) Total air capacity \_\_\_\_\_

### **Supernatant Separation and Scum and Grease Removal**

#### **Supernatant Separation**

Facilities shall be provided for effective separation or decanting of supernatant. Separate facilities are recommended; however, supernatant separation may be accomplished in the digestion tank provided additional volume is provided as indicated under Tank Capacity (page 2). The supernatant drawoff unit shall be designed to prevent recycle of scum and grease back to plant process units. Provision should be made to withdraw supernatant from multiple levels of the supernatant withdrawal zone.

- a) Volume \_\_\_\_\_
- b) Is multiple level of supernatant withdrawal provided \_\_\_\_\_
- c) Point of discharge \_\_\_\_\_

#### **Scum and Grease Removal**

Facilities shall be provided for the effective collection of scum and grease from the aerobic digester for final disposal and to prevent its recycle back to the plant process and to prevent long term accumulation and potential discharge in the effluent.

- a) Is scum and grease withdrawal point provided? \_\_\_\_\_
- b) Final disposal \_\_\_\_\_

### **High Level Emergency Overflow**

An unvalved high level overflow and any necessary piping shall be provided to return digester overflow back to the head of the plant or to the aeration process in case of accidental overfilling. Design considerations related to the digester overflow shall include waste sludge rate and duration during the period the plant is unattended, potential effects on plant process units, discharge location of the emergency overflow, and potential discharge of suspended solids in the plant effluent.

- a) Is an unvalved high level overflow and any necessary piping provided? \_\_\_\_\_
- b) Discharge location of the emergency overflow \_\_\_\_\_



**QUESTIONS**

1) What is the method of ultimate treatment and/or disposal?

\_\_\_\_\_

2) Is a method of sampling or measuring supernatant provided?

\_\_\_\_\_

3) Are any problems anticipated with heavy metals, pH, toxics, etc.?

\_\_\_\_\_