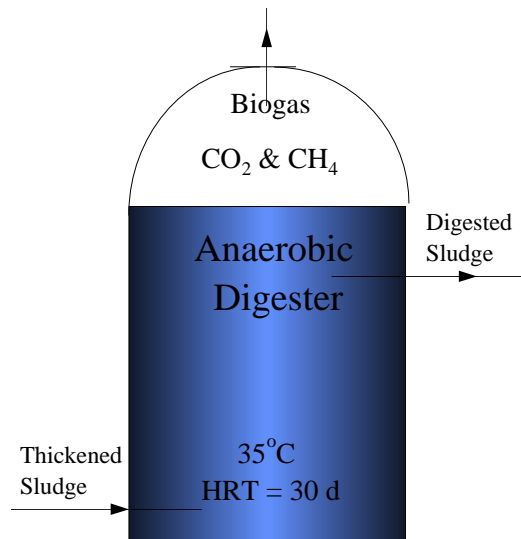


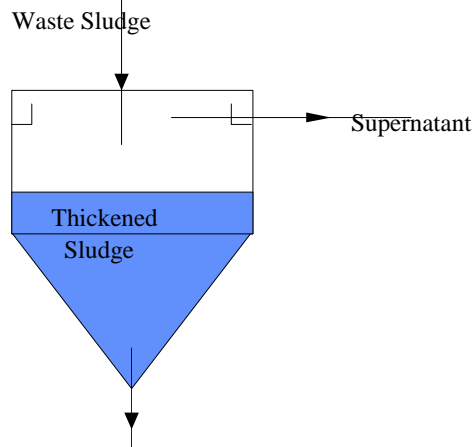
Sludge Treatment

The basic processes for sludge treatment are as follows:

- **Thickening:** c _____ sludge using gravity or f _____ methods. Primary sludge can be thickened to a maximum of about 10% solids and secondary sludge



Gravity Thickener

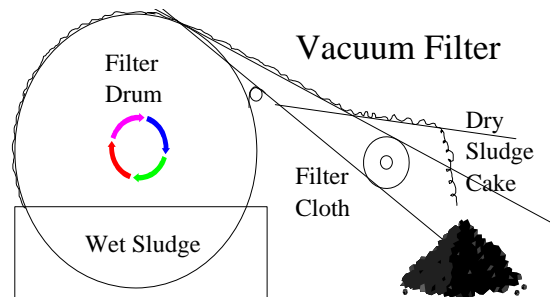


to a maximum of about 6% solids.

- **Stabilization:** converting the o _____ in the sludge to more stable (inert) forms so they can be handled more easily (more d _____, less potential for odors) and used as soil conditioners. Typically stabilization involves **anaerobic** or **aerobic digestion**. During digestion considerable v _____ s _____ destruction occurs

- **Conditioning:** Addition of c _____ to allow better separation of the water and the solids. Ferric c _____ and organic and inorganic p _____ are frequently used for sludge conditioning.

- **Dewatering:** V _____, pressure, or drying methods for removing w _____ from the solids. Typically about 25 to 35% solids can be achieved.



- **Volume Reduction:** Drying and p _____, C _____, or I _____ of sludge with ash residual for ultimate disposal.

Biosolids are t _____ s _____; there are two different classes:

- Class A: no detectable levels of p _____ and meets m _____ regulations, requires controlled treatment process involving high pH, temperature, or both; no permit required for land application
- Class B: have been t _____ but may contain some pathogens and metals, requires p _____ for land application

Processes for generating Class A biosolids:

- sludge p _____
- t _____ treatment (55°C for 24 h)
- temperature p _____ anaerobic digestion, TPAD (55°C digester followed by 35°C digester) developed at ISU