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 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.

- **Reduction:** I_________________ of sludge with ash residual for ultimate disposal.

Biosolids are t_________ s_________; there are two different classes:

- Class A: no detectable levels of pathogens and meets m_________ regulations, requires controlled treatment process involving high pH, temperature, or both; no p__________ required for land a__________________

- Class B: have been treated but may contain some p__________ and metals, requires permit for land application — **approximately ____% of all biosolids are land applied**

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 results in Class A biosolids with stable performance and low odors.