

## DO Control in the Sludge Digestion Process

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Solids remaining after primary clarification and secondary wastewater treatment processes must be converted from highly organic solids to inorganic solids that can be safely applied to land or disposed of in sanitary landfills.

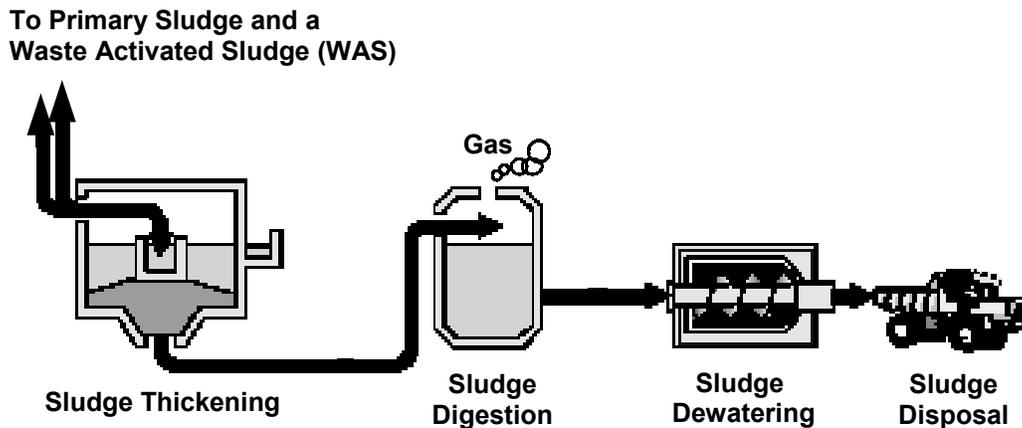
There are two modes of sludge digestion that most wastewater treatment plants use to reduce the volatile solids content of these organic solids from 70-80% to a final 45-55%:

**1. Anaerobic Digestion.** This process uses acid-forming bacteria and methane-fermenting bacteria to convert the solids. These bacteria

propagate in a high temperature environment, 92 to 98 °F, and only in the absence of dissolved oxygen (DO).

Unwanted oxygen is present in anaerobic digesters when mixing rates are too high, when re-circulation rates are too high, and/or when too much activated sludge is wasted. Operators should monitor DO in the digester to make certain there is no oxygen in the system. However, anaerobic digesters produce H<sub>2</sub>S gas that can poison traditional electrodes of conventional DO measurement systems.

Typical wastewater treatment and sludge digestion process



**2. Aerobic Digestion.** An aerobic digester uses aerobic bacteria to break down organic matter. When bacteria consume all of the organic matter, they become cannibalistic and revert to an endogenous respiration phase.

These bacteria will only consume organic solids in the presence of dissolved oxygen, so DO sensors should be used to maintain a level of 0.5 to 2 mg/l DO. However, sulfur-producing bacteria in the sludge can produce hydrogen sulfide gas that will poison traditional DO electrodes.

### **New technology solution**

The high solids concentrations found in digesters, typically from 3 to 5%, also make measuring DO

readings very difficult with standard technology. Solids quickly coat traditional sensors and render them useless.

HACH LDO™ is the only technology on the market today that can make DO measurements in the sludge digester application because the LDO Probe is not affected by H<sub>2</sub>S. It continues to measure DO in the presence of high solids concentrations, as long as oxygen can get through to the sensor. Adding a self-contained, air-blast cleaning system further reduces necessary cleaning and operator attention.



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