**Section 370.845 High pH Stabilization**

a) General

Alkaline material may be added to liquid primary or secondary sludges for sludge stabilization in lieu of digestion facilities, to supplement existing digestion facilities, or for interim sludge handling. Inasmuch as the high pH stabilization process does not reduce organic matter but rather increases the mass of dry sludge solids, so that additional volumes of sludge will be generated in the absence of supplemental dewatering, the design shall account for the increased sludge quantities for storage and handling, transportation and disposal methods and associated costs. Alkaline material may be added to dewatered sludges for stabilization pursuant to Section 370.520(b).

b) Operational Criteria

Sufficient alkaline material shall be added to liquid sludge in order to produce a homogeneous mixture with a minimum pH of 12 after 2 hours of vigorous mixing. Facilities for adding supplemental alkaline material shall be provided to maintain the pH of the sludge during interim sludge storage periods.

c) Odor Control and Ventilation

Odor control facilities shall be provided for sludge mixing and treated sludge storage tanks that are located within ½ mile of residential or commercial areas. Indoor sludge mixing, storage and processing facilities shall have ventilation that meets the ventilation requirements contained in Section 370.410(g)(1-4) and (6) and shall comply with the safety precautions contained in Section 370.560. Adequate facilities shall be provided to condition the exhaust air to meet the applicable substantive and permitting requirements of 35 Ill. Adm. Code Subtitle B: Air Pollution.

d) Mixing Tanks and Equipment

1) Tanks

Mixing tanks may be designed to operate as either a batch or continuous flow process. A minimum of two tanks of adequate size to provide a minimum of 2 hours of contact time in each tank shall be provided. The following factors shall also be taken into account in determining the number and size of tanks:

A) Peak sludge flow rates;

B) Storage between batches;

C) Dewatering or thickening performed in tanks;

D) Repeating sludge treatment due to pH decay of stored sludge;

E) Sludge thickening prior to sludge treatment;

F) Type of mixing device used and associated maintenance and repair requirements.

2) Equipment

Mixing equipment shall be designed to provide vigorous agitation within the mixing tank, to maintain solids in suspension and to provide for a homogenous mixture of the sludge solids and alkaline material. Mixing may be accomplished by either diffused aeration or mechanical mixing. For diffused aeration, an air supply of 30 cfm per 1000 cubic feet of mixing tank volume with the largest blower out of service shall be provided. Nonclogging diffusers designed to permit continuity of service should be used. Mechanical mixers shall be designed to assure continuity of service during freezing weather conditions and shall be equipped with impellers designed to minimize fouling from debris in the sludge.

e) Chemical Feed and Storage Equipment

1) General

Equipment used for handling or storing alkaline shall be designed to provide operator protection from eye and tissue damage. Refer to Section 370.560 for proper safety precautions. Material storage, slaking and feed equipment shall be sealed as airtight as practicable to prevent contact of alkaline material with atmospheric carbon dioxide and water vapor and to prevent the escape of dust material. All equipment and associated transfer lines and piping shall be accessible for cleaning.

2) Feed and Slaking Equipment

The design of the feeding equipment shall be determined by the treatment plant size, type of alkaline material used, slaking required and operator requirements. Automated or batch equipment may be used. Automated feeders may be volumetric or gravimetric, based on accuracy, reliability and maintenance requirements. Manually operated batch slaking of quicklime (CaO) should be avoided unless protective clothing and equipment are provided. At small plants, for safety reasons the use of hydrated lime (Ca(OH)[2]) over quicklime is recommended. Feed and slaking equipment shall be sized to handle a minimum of 150% of the peak sludge flow rate, including sludge that may need to be retreated due to pH decay. Duplicate units shall be provided.

3) Chemical Storage Facilities

Alkaline materials may be received in either bag or bulk form. Materials delivered in bags must be stored indoors and elevated above floor level. Bags should be multi-walled and moisture-proof. Dry bulk storage containers must be as airtight as practicable and shall contain a mechanical agitation mechanism. Storage facilities shall be sized to provide a minimum 30-day supply of alkaline materials. Adequate provisions shall be made to meet the applicable substantive and permitting requirements of 35 Ill. Adm. Code Subtitle B: Air Pollution.

f) Sludge Storage

Refer to Section 370.870 for general design considerations for sludge storage facilities. The design shall incorporate the following considerations for the storage of high pH stabilized sludge:

1) Liquid Sludge

Liquid high pH stabilized sludge shall be stored in a tank or vessel equipped with rapid sludge withdrawl mechanisms for sludge disposal or retreatment and may not be stored in a lagoon. Provision shall be made for adding alkaline material in the storage tank. Mixing equipment meeting the requirements of subsection (d)(2) above shall be provided in all storage tanks.

2) Dewatered Sludge

On-site storage of dewatered high pH stabilized sludge shall be limited to 30 days. Provisions shall be made for rapid retreatment or disposal of dewatered sludge stored on site in case of sludge pH decay.

3) Off-Site Storage

There shall be no off-site storage of high pH stabilized sludge unless the Agency has issued a permit for off-site storage.

g) Disposal

Methods and options for immediate sludge disposal should be used in order to reduce the on-site sludge inventory and the amount of sludge that must be retreated to reduce odors when sludge pH decay occurs. Where land application is used, the sludge must be incorporated into the soil within 24 hours after application.

(Source: Added at 21 Ill. Reg. 12444, effective August 28, 1997)