ODOR CONTROL TECHNOLOGY SUMMARY

Technology: IRON SALTS (Ferrous Chloride, Ferrous Sulfate, Ferric Chloride)

Description:

Iron Salts are a chemical treatment for wastewater, often added to wastewater collection systems upstream from treatment plant influents to control hydrogen sulfide emissions. Iron Salts include Ferrous Chloride, Ferrous Sulfate and Ferric Chloride. Iron Salts are precipitants that oxidize and precipitate dissolved sulfides in wastewater to form iron sulfides. The iron sulfides are insoluble and cannot be stripped from the wastewater.

Chemical Addition System (with secondary containment)

Iron Salts are typically dosed with metering pumps upstream of treatment plants or in pumping stations. The dosage is usually in proportion to flow and dissolved sulfide concentrations or as required to control hydrogen sulfide emissions. Dosages may vary seasonally. The chemicals are normally stored in FRP or HDPE tanks and require secondary containment, since they are corrosive and may be considered hazardous. The chemicals have a relatively high freezing point (28^{o}F) and may require freeze protection.

Iron Salts are relatively inexpensive, but require special handling due to the highly corrosive nature. Protective clothing, gloves, and goggles are recommended when handling the chemicals. Iron Salts are generally the lowest cost chemicals (per gallon)

used for odor control because they are a waste by-product of the steel industry. However, they generally require significantly higher dosages than other alternatives, such as Bioxide. Iron Salts have a practical treatment limit of approximately 0.5 mg/L dissolved sulfides, as compared to a practical treatment limit of approximately 0.1 mg/L dissolved sulfides for Bioxide.

Applicable Treatment Processes:

Pump Stations, treatment plant headworks.

Typical Design Criteria:

Dosage	1.64 pounds Fe^{++} per pound of dissolved sulfides (3.3gal $FeSO_4$/lb dissolved sulfide)

Major Design Considerations:

a. Location of injection

The chemical should be injected just upstream from the treatment plant to enhance precipitation in the plant processes and decrease hydrogen sulfide loadings at the plant.

b. Special Handling

The chemical requires storage tanks with secondary containment because it is a hazardous chemical which is highly corrosive, therefore appropriate site location must be considered. The chemical has a freezing point of $-4^{o}F$, therefore freeze protection may also be required.

c. Metals

Iron salts commonly contain traces of other metals that will settle out in the biosolids at wastewater treatment plants. These metals could affect biosolids disposal options or create a permitting issue.