TECHNICAL BULLETIN: Wastewater

Wastewater Clarification

Clarification, aided by effective coagulants such as iron and aluminum salts, enhances plant production in primary, secondary and tertiary treatment. The positively charged metal hydroxide flocs that form in wastewater at a pH range of 4 to 9 collect the negatively charged suspended particles. Proper coagulation leads to the formation of larger, stronger, heavier floes, resulting in quicker settling rates and a denser sludge blanket.

General Chemical manufactures and supplies historically proven aluminum and iron based coagulants. The most commonly used coagulants in wastewater treatment are Aluminum Sulfate (alum), Ferric Sulfate, Aluminum Chloride, Ferric Chloride and Aluminum Chlorohydrate.

Primary Treatment

Chemically Enhanced Primary Treatment (C.E.P.T.) and new emerging technologies for high rate primary treatment can utilize aluminum and iron salt coagulants to enhance flocculation. Anticipated dosages will likely be in the 50-150 mg/L range, depending on existing water conditions.

Suspended Solids Removal

Proper coagulant selection and dosage rate plus an optimized injection point promote effective suspended solids removal. In addition to enhancing plant throughput, coagulants provide consistent and stable operation. Depending on certain wastewater characteristics such as pH and alkalinity, the appropriate coagulant will remove greater than 99.5% of the settleable material.

Turbidity and Color Reduction

Turbidity, an optical measurement defined by light scattering, can be used to measure clarifier effluent clarity. Regularly used in the clarification of drinking water, coagulants reduce effluent turbidity, suspended solids and color.

BOD Reduction

In secondary clarification, where the bacteria population from a conventional activated process is controlled, coagulants remove BOD by settling biomass.

Contaminant Reduction

By treating the wastewater at the optimum location, several dissolved contaminants such as phosphorus or sulfide can be precipitated by coagulation with aluminum or ferric salts. (Please refer to other General Chemical publications for a detailed description of phosphorus reduction and hydrogen sulfide reduction.) These precipitated materials then settle as suspended solids for removal during clarification. Aluminum and ferric salts also reduce levels of fats, oils, and grease.

Stormwater Treatment

Many stormwater treatment facilities rely on coagulants to cope with peak loading conditions. The higher throughputs experienced during stormwater treatment require fast settling times and effective

clarification or solids removal. Even under these high rate conditions, coagulants must continue to control site dependent contaminants such as phosphorus.

Inorganic coagulants are proven to be effective in wastewater clarification. Typical dosage rates vary depending on the coagulant and the specific composition of the wastewater. Experienced General Chemical technical personnel are available to assist in selecting the proper coagulant and dosage rate, as well as choosing the optimum feed point, to meet your wastewater clarification needs.

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