

ODOR CONTROL TECHNOLOGY SUMMARY

Technology: BIOXIDE & BIOXIDE AQ

Description:

Bioxide and Bioxide AQ are common chemical treatments for wastewater, used for the prevention of sulfide (hydrogen sulfide) formation and/or oxidation of sulfides in the wastewater. The process uses naturally occurring bacteria to biochemically oxidize dissolved sulfide in the presence of nitrate. These chemicals are typically utilized in force mains, where anaerobic conditions may occur because oxygen transfer to the wastewater is limited. Bioxide is basically a calcium nitrate solution.



Chemical Addition System

Bacteria in wastewater collection systems will use dissolved oxygen, nitrate, and sulfate as oxygen sources for respiration, in that order of preference. Dissolved oxygen is usually present in fresh wastewater, but is rapidly depleted by biological activity. There is typically very little nitrate present in the wastewater, while sulfate is typically abundant. Since little or no nitrate is available, the bacteria begin utilizing sulfate when the dissolved oxygen is depleted. The byproduct of the sulfate uptake process is

dissolved sulfide. The dissolved sulfide combines with hydrogen ions to form hydrogen sulfide, causing odor and corrosion problems.

Bioxide works by providing for a population of beneficial bacteria that oxidize dissolved sulfide and other reduced sulfur compounds as part of their metabolism.

Bioxide AQ contains Anthraquinone, a chemical compound that prevents the formation of hydrogen sulfide in the slime layer by interrupting the sulfate reduction process carried out by the sulfate-reducing bacteria under anaerobic conditions.

Both chemicals are considered to be non-hazardous chemicals, and are relatively easy and safe to store, handle, and apply. The chemicals are typically injected into force mains through the use of chemical metering pumps. Bioxide has a practical treatment limit down to approximately 0.1 mg/L dissolved sulfides.

Applicable Treatment Processes:

Force mains, gravity sewers.

Typical Design Criteria:

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| Dosage | Bioxide: 0.7 – 2.1 gallons per pound of dissolved sulfide |
| | Bioxide AQ: 0.5 – 1.5 gallons per pound of dissolved sulfide |

Major Design Considerations:

- a. Location of injection

The chemicals should be injected into force mains at a location to allow for adequate mixing and retention time.