BlueInGreen™
Dissolved Gas Solutions for Water Quality

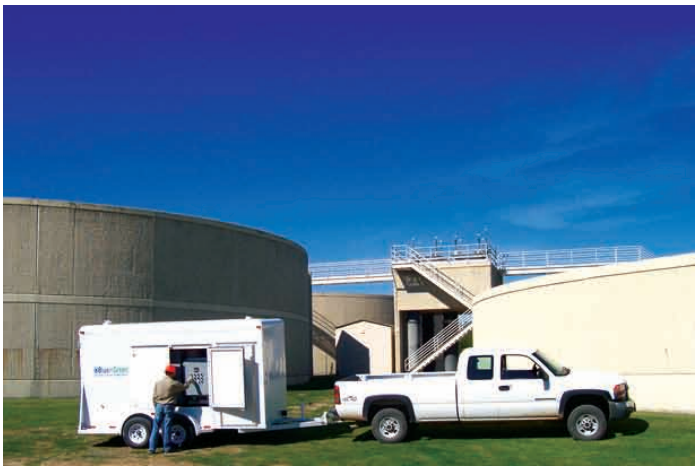
Odor Control Applications

The Supersaturated Dissolved Oxygen Injector (SDOX™) uses a patent pending technology for delivering dissolved oxygen (DO) to water. The benefits of the SDOX over current technology are lower operating costs, far greater flexibility over where and when dissolved oxygen is delivered to any point in a water system where odors are a concern, and precise control of water DO even as flow rate and oxygen demand are continually changing. The SDOX is an ideal solution to reduce the emission of odors from industrial and municipal wastewater caused by anaerobic conditions.

The benefits of the SDOX over current oxygenation/aeration technology include:

- Rapid delivery of dissolved oxygen that allows for immediate reduction in odors;
- Delivery of oxygen in dissolved form prevents stripping of odors into the atmosphere that can be caused by bubble or surface agitation aeration.
- Low capital and operating costs;
- Greater flexibility over where and when dissolved oxygen is delivered to odorous wastewater;
- Portability options, so odor generating water can be treated at any location including in large tanks or pipes;

The SDOX pumps a side-stream of water supersaturated with oxygen to the water being treated. Unlike typical side-stream systems that increase side stream DO to 50-60 mg/L, the SDOX provides water with 310 mg/L of DO or greater. The high concentration of dissolved oxygen injected provides a large excess of DO for wastewater with extreme oxygen demand. This side stream is then injected at a high velocity into an entrainment tube that can be located anywhere within the wastewater column. The result is that the supersaturated side-stream is nearly instantaneously mixed with the wastewater (efficient liquid-to-liquid mixing). The overall DO concentration is then below saturation and oxygen gas is prevented from leaving solution in the form of bubbles. This innovative process results in



BlueInGreen, LLC
535 W. Research Center Blvd., Suite 135
Fayetteville, AR 72701
Phone : (479) 527-6378
Fax : (479) 571-8814

near 100% efficient utilization of oxygen. In other words, the oxygen gas entering the SDOX is delivered in nearly 100% dissolved form to the wastewater; virtually no oxygen is lost to the atmosphere.

The energy from the high velocity side stream is utilized to mix and distribute the oxygenated water throughout the system and will prevent settling of solids. The side stream can also be delivered by a variety of injection options including plume, flash mixing, and directed injection for site specific needs to either minimize or maximize mixing. No additional energy must be added to mix or distribute the oxygenated water.

The side-stream delivery technique also allows for efficient oxygenation of odorous wastewater containing solids of any size. Solids up to 1/4 inch can be tolerated. All internal components are non-fouling and stainless steel to prevent corrosion.

SDOX technology has been shown to substantially reduce the emission of odorous compounds from a variety of sources of wastewater, including animal waste lagoons, food processing facilities and municipal wastewater treatment facilities. Because the SDOX adds oxygen to wastewater at the molecular level, facultative anaerobic microbes are rapidly able to shift metabolic processes toward aerobic respiration, resulting in decreased production of reduced byproducts such as hydrogen sulfide, methane, and other nuisance gasses.

Examples of how the SDOX can be used for odor control are:

- Aeration of outdoor wastewater storage and treatment tanks;
- Forced main and lift station supplemental oxygenation for odor control and wastewater conditioning;
- Surface aeration of facultative lagoons to prevent anaerobic odor release but allow anaerobic processes at the bottom of the lagoon;
- Precise control of DO in aerobic processing tanks to prevent anaerobic and odorous conditions while minimizing costs by adding only the amount of oxygen needed to maintain aerobic conditions;
- Oxygenating difficult to mix and high particulate wastewater such as in sludge digesters;
- Prevention of anaerobic conditions in recreational ponds and lakes without requiring fountains or surface aerators that can widely distribute odors.

The source of oxygen for the SDOX can be liquid oxygen, oxygen generators, or compressed air. The SDOX is available in several sizes, providing delivery rates up to 3000 lbs of DO per day. SDOX units can be manually or automatically operated, depending on user requirements. Fully automated SDOX units utilize a PLC that can easily be integrated into existing plant control systems. Portable SDOX units are available that can be operated in response to intermittent, site-specific needs. Variable speed pump drives with high efficiency motors are used so delivery rates can be easily varied from 40% to 100% full capacity without compromising efficiency.