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WEFTEC® 2016 Report: Creating the future of water

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Tackling treatment odors and H_2S emissions in hot climates

Vaporization systems that deliver safe Ecosorb® product vapors offer an economical and effective odor control solution in hot, water-scarce regions, according to Dr. Laura Haupert at OMI Industries.

Wastewater treatment facilities in the Middle East must address a wide range of odor challenges caused by year-round hot temperatures. Additionally, high levels of hydrogen sulfide (H_2S) emissions can be problematic due to excessive heat and can potentially be dangerous to plant employees and neighboring residences.

As summertime temperatures often rise above 37 degrees Celsius (100 degrees Fahrenheit), many wastewater treatment facilities in the Middle East are faced with sewage that breaks down much quicker in the waste transfer lines, and many plant managers make costly investments in caustic scrubbers to counter higher hydrogen sulfide emissions.

This investment is often required for safety reasons, as even the lowest level of exposure to hydrogen sulfide can be highly toxic. In the United States, the Occupational Safety & Health Administration (OSHA) has stated that concentrations of 100 parts per million (ppm) or greater are "immediately dangerous to life and health." Exposure at lower concentrations can cause irritation to the eyes, nose, throat, and respiratory system, whereas higher levels of exposure can cause shock, convulsions, inability to breathe, extremely rapid unconsciousness, coma, and even death.

Hydrogen sulfide is a colorless gas that is often reported to smell like a rotten egg, and it is produced by the bacterial breakdown of organic materials as well as and human and animal wastes, making its odor a common occurrence in wastewater treatment facilities.

Water-free, non-toxic solutions

Odor control solutions that do not require water, such as vaporization, are attracting greater interest in regions experiencing water shortages. Similar to atomization, which creates a fine mist of odor-eliminating product delivered with water, vaporization uses no water. OMI Industries' Ecosorb odor eliminator uses a vapor phase system to deliver dry Ecosorb product vapors through a perforated pipe distribution system.

In rapidly developing Qatar, limited groundwater supplies are highly exploited, and costly desalination is often the most viable solution for maximizing this precious resource. To increase water supply, the Qatar National Development Strategy 2011–2016 called for more infrastructure investment in wastewater treatment facilities with much of the recycled water being used to help support crop irrigation. Increasing investment in treatment plants will result in an expanded demand for solutions that reduce odors and harmful emissions.

Additionally, the demand for non-toxic, eco-friendly solutions that contain natural ingredients, such as essential oils and food grade surfactant, is rising. These solutions avoid the use of odor masking agents, many of which can be toxic and environmentally unsafe.

Many wastewater treatment facilities, including those in the Middle East, use chemical oxidizers or aeration solutions for removing sulfide molecules from their systems because there has never really been an offering that removes these harmful emissions and reduces odors with the same solution and in a safe fashion.

Increasing investment in treatment plants will result in an expanded demand for solutions that reduce odors and harmful emissions.

In an effort to provide a safe and effective alternative, the US company OMI Industries developed Ecosorb technology and equipment, which eliminates odors without the use of harsh or hazardous chemicals, emission control systems, or masking fragrances. New solutions, such as Ecosorb, allow wastewater treatment facilities to fight municipal and wastewater treatment odors while also reducing hydrogen sulfide emissions by more than 95 percent. The new offerings are more cost effective than using traditional scrubbers, and they are safe for plant employees and neighboring residences.

Comprised of a blend of plant oils, food grade surfactants, and purified water, the offerings can safely be sprayed or air atomized in the open air when employees are present. In addition to reducing emissions from hydrogen sulfide as well as mercaptans, amines, and thioethers, these new solutions offer strong odor control across a broad spectrum of odorous compounds, and they are also biodegradable. Furthermore, they can be used without water, depending on application and delivery equipment, to remove odorous compounds, including acids and bases.

Conclusions

As development in the Middle East will continue into the near- and long-term, there is an ongoing need for effective and safe wastewater treatment faculties, especially with water being in limited supply. And with temperatures continuing to rise, addressing hydrogen sulfide emissions will become a long-term challenge for wastewater treatment plants.

Fortunately, the odor control industry is stepping up with cost-effective solutions that enable treatment facilities to safely and effectively reduce odor and caustic emissions.

Author's Note

Dr. Laura Haupert is the director of research and development for OMI Industries, a US-based company that specializes in developing natural solutions for the treatment of industrial odors.

Above: The business district in Doha, Qatar, is continually expanding, reinforcing the need for more infrastructure investment for wastewater treatment facilities. Photo by OMI Industries