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**Pond odor control 101: Practical solutions for retention pond odor management in sugar beet processing.**

Odor control in retention ponds, especially those used in high-loading industrial processes like sugar beet processing, is essential for protecting environmental quality, maintaining positive community relations, and in some cases, meeting permit requirements. These odors originate from high biological oxygen demand (BOD) and chemical oxygen demand (COD) loadings, which deplete oxygen in the pond and lead to anaerobic conditions. This process results in the release of volatile, odorous compounds such as hydrogen sulfide (primarily), ammonia, amines, mercaptans, and organic acids, which can be a significant nuisance if left unaddressed. This presentation takes a wholistic approach to managing pond odors, starting with looking at how to keep sugar hits from happening in the first place (process improvements & high-risk events inside the process.) We will also go over best sampling and monitoring techniques to help identify and quantify the components causing nuisance odors. Using these methods also help to evaluate each treatment strategies' efficacy. USP's recommended approach involves monitoring parameters like COD/BOD, pH, temperature, dissolved oxygen, and key odorant compounds, along with specialized procedures, such as the Purge Test, to help assess volatile odorants in liquid samples. Additionally, we will cover the use of handheld and temporary/permanent installation for fence line and point source odor sniffing. With a clear assessment of pond conditions, targeted odor control strategies can be implemented to prevent volatilization and directly address pond odors. Strategies for reducing odorous compound volatilization include the use of binding agents, pH adjustments, and physical containment measures like controlled aeration timing or pond covers. Addressing pond septicity is equally important and may require aeration and oxygenation solutions, ranging from mechanical aeration to the addition of hydrogen peroxide, nitrates, or biocides to support biological balance. Controlling the pond's microbial environment is another strategy for odor management. Through bioaugmentation, specific strains can be encouraged to proliferate and out-compete odor-producing bacteria. Additionally, liquid-phase oxidation treatments—whether through pond capping, targeted area applications, or full-volume treatment—can provide efficient odor reduction and an operational lever to pull during process upsets. For vapor-phase emissions, options like masking agents, cover-and-treat methods, and improved ventilation help to manage off-gassing effectively. These targeted approaches provide sustainable, reliable odor management solutions for retention ponds, supporting both sugar beet processing operations and the broader community by mitigating nuisance odors. This presentation will cover a wide variety of topics and will use the experience and expertise of multiple operators and vendors.