Solving Ammonia Problems with Waste Go

What's the big deal?

Lagoon ammonia has become a hot topic over the past few years. Many environmental agencies have been introducing new ammonia limits for wastewater facilities, including lagoons. This is a problem because most wastewater lagoon systems were not originally designed for ammonia treatment; as a result, most will require some kind of intervention.

What's the answer?

Nitrification is the most common way to biologically remove ammonia in wastewater lagoons. In this process, ammonia treatment occurs courtesy of bacteria and enzymes added to the water. These bacteria and enzymes break down the ammonia and eventually promote the release of nitrogen gas into the atmosphere. The end result is that your wastewater lagoon ammonia is nitrified, resulting in lower ammonia levels in your effluent.

How do I do it?

Removing Lagoon Ammonia via Nitrification Requires:

1. **Healthy levels of dissolved oxygen (DO) in your lagoon**—Wastewater lagoon nitrification consumes large quantities of oxygen. Just for reference, every pound of BOD oxidized consumes 1.5 lbs of O2. On the other hand, according to Metcalf & Eddy, every pound of ammonia oxidized consumes 4.57 lbs of O2. In order for lagoon nitrification to occur, a minimum working DO level of 2.0 mg/L is required and a DO level of 5 mg/L is optimal. Therefore, you must ensure that your lagoon aeration system is properly sized, and working efficiently and effectively enough to provide the necessary oxygen.

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2. **BOD reduction—**Nitrifying bacteria do not compete well against BOD-removing heterotrophic bacteria. For nitrification to take place, BOD levels must be sufficiently reduced in order to eliminate competition. Generally a BOD level of 20–30 mg/L is required before lagoon ammonia removal can begin.

3. **Lagoon pH of 7.0–8.0—**Lagoon nitrification is pH-sensitive, and ammonia treatment rates decline significantly at pH values below 6.8. Optimal lagoon nitrification rates occur at pH values in the 7.0 to 8.0 range.

4. **Sufficient lagoon water temperature—**Similar to many other wastewater lagoon treatment processes, nitrification slows as water temperature decreases. Optimal temperature range for lagoon nitrification is 82 to 97° Fahrenheit. This is clearly unrealistic for most wastewater lagoons, but acceptable rates of lagoon nitrification can also be achieved at or above 68° F.

5. **Adequate mixing—**Ammonia can be released as a result of the anaerobic digestion of sludge at the bottom of the lagoon. As a result, without mixing to prevent sludge buildup, ammonia effluent levels can actually end up being higher than that of influent. Ideally, it is recommended that sludge depths remain below 2 feet. Another adverse effect of a poorly mixed lagoon is short circuiting. This occurs when a basin becomes stratified, allowing influent flows to take a “short cut” through it by only moving through the top layer (or stratum) of the water. This lack of homogeneity results in reduced retention time for the water, and generally leads to poor overall treatment, including poor BOD and ammonia treatment.

6. **Biomass—**Nitrifying bacteria are attached-growth organisms, so the more surface available for them to attach to, the more will grow.

Removing lagoon ammonia through nitrification is not an easy process to master, and with stricter effluent requirements, it’s a problem that won’t go away any time soon.

That seems like A LOT to handle and costly….

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WASTE GO
BIOLOGICAL WASTEWATER TREATMENT

How can Waste Go help?

Anaerobic organisms break waste and proteins down very slowly producing ammonia in the process. The aerobic organisms in Waste-Go will break the proteins down much faster and also use up nitrogen which is a key component in ammonia. In this manner, Waste-Go will reduce the amount of Ammonia being produced by the lagoon.

In detail, Waste Go cuts out all the hard work and does it for you by:

1. Restoring healthy levels of dissolved oxygen (DO) by reducing ammonia production and thus reducing oxygen demand.

2. Reducing BOD levels to extreme lows allowing Nitrification to take place as soon as treatment is applied.

3. Correcting pH levels. Waste Go has pH adjusters built in to help ensure your Lagoon pH is in the optimal zone.

4. Aerobically digests sludge that reduces the release of Ammonia and eliminates NO2 odours.

5. Reduces the need for mixing once a healthy Lagoon environment is established using Waste Go.

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