

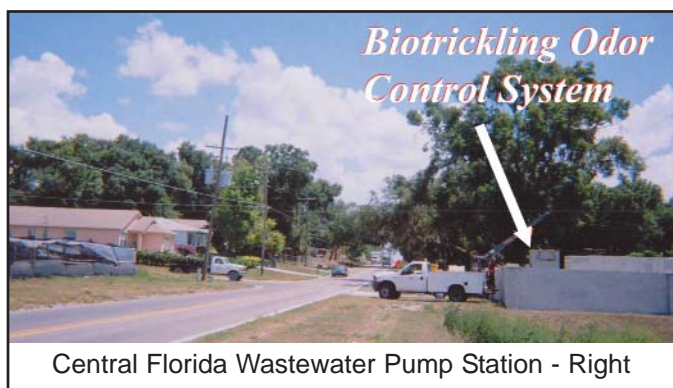
Odor Complaints Eliminated at Florida Lift Station
Effective Control of Odor Surges to 800 ppmv H₂S

\$50,000 Savings

Introduction

Numerous cities and counties in central Florida are experiencing explosive growth. This growth is placing a constantly increasing burden upon the public sewer systems in all areas of the state. As sewer systems extend their reach, more lift stations are needed to move the wastewater from source to treatment plant – and more water must constantly be moved by existing pump stations as well. This has led to odor complaints in neighborhoods adjoining such facilities, which HD Q-PAC® media from Lantec Products, when used in an odor control system, eliminated.

Typical of odor control problems is the lift station located on Bradshaw Road in Apopka, Florida seen below. The pumping facility is designed to present a very low profile when viewed from the street. This is a consequence of a neighborhood of modest single family houses located directly across the narrow two lane road.



Central Florida Wastewater Pump Station - Right

Lift Station Odor Problem

The odor problems at this lift station are very challenging. Hydrogen Sulfide levels in the wet well measure at an average of ~ 250 to 300 ppmv. OSHA classifies exposure to 300 ppmv H₂S as “immediate danger to life”. And even more challenging, surges of H₂S commonly of 400 – 600, and on one occasion 800 ppmv, are measured at this pump station. Exposure to 600 ppmv H₂S will result in death in less than 2 minutes. Not only was this a source of frequent odor complaints as the H₂S disperses in the local area; hydrogen sulfide at these concentrations is an immediate threat to life for anyone exposed to the gas.

Biological Odor Control

The municipality required an odor control solution that would:

1. Effectively destroy H₂S and other fugitive malodorous gases such as Carbonyl Sulfide, Methyl Mercaptan and Dimethyl Sulfide at very high efficiency.
2. Would be compact so as not to disturb the low line of sight profile at the lift station.
3. Be suitable for a remote location without requiring permanent staffing.
4. Be cost effective.

The biological odor control option potentially can easily fulfill all of the above requirements. A system, properly designed and operated, will allow a bloom of Thiobacillus bacteria to develop. This genus of bacteria is autotrophic. Several species are known to exist in nature, Thiobacillus thiooxidans is commonly mentioned. This species of bacteria utilizes inorganic carbon to build cell structure. It digests sulfide into sulfate in its life cycle and is very tolerant of extremely acidic conditions.

An alternate control option would be a chemical scrubber. But a scrubber would require storage of large volumes of hazardous industrial chemicals, most likely sodium hypochlorite or bleach (NaOCl) and caustic soda (NaOH). Typically, bleach is stored at 12.5% strength in a vessel with a floating roof because the solution slowly decomposes in storage to chlorine (Cl₂) which is a source of secondary “swimming pool” odor complaints. Caustic is normally stored at 50% strength. And because of the high concentrations of H₂S at this pump station, 35,000 gallons (132 m³) of bleach and 3,000 gallons (11 m³) of caustic would be required annually to supply a chemical scrubber. The cost of these chemicals is estimated at over \$50,000 per year – plus the cost of the scrubber and the storage tanks, and the cost of at least one employee assigned to the site on a 24 hour basis due to the hazardous nature of these chemicals when stored in bulk. As the photo below shows, cost considerations aside, a chemical scrubber with chemical storage vessels is simply impractical at this lift station.



Biotrickling Odor Control System
Bradshaw Road Lift Station

Biotrickling Filter Odor Control System

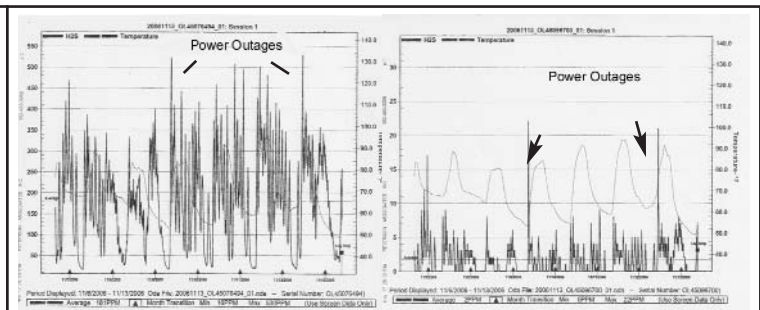
Lantec Products consulted with the local sewer district regarding the odor problems at this lift station. As a result it was decided to install a biotrickling (common synonyms: biofilter, bioscrubber, bioscrubber, biological scrubber) odor control unit that contains HD Q-PAC® supplied by Lantec Products. This system was originally designed to accept 1000 cfm of malodorous air. This system was chosen not only because it was capable of high destruction of the hydrogen sulfide and other smelly gases troubling this lift station, but also because the system would easily blend in with the esthetics of the site. The biotrickling filter vessel is just slightly taller than the lift station wall. After installation and startup, within three days all odor complaints from the neighbors across the street ceased. The performance of the biotrickling filter is summarized below:



Apopka, FL
Biotrickling
Odor Control System

Biotrickling Filter Performance

Air Flow:	420 cfm
Biological Support Media:	HD Q-PAC® w/ proprietary inert synthetic media
Average Inlet H ₂ S:	250 - 300 ppm _v
Daily Surges of H ₂ S	
To 400 ppm _v :	10 times daily
To 500 ppm _v :	5 times daily
H ₂ S Removal Efficiency	99%+
Odor Complaints:	none
Savings:	\$50,000



Typical Weekly Inlet and Outlet H₂S Concentrations
 Note - outlet spikes of H₂S are the result of biweekly generator shutdown / switch over.
99%+ Average Destruction Efficiency

Summary

The local municipality is very pleased with the performance of the system, which operates with HD Q-PAC® media in the biotrickling odor control system. Not only because using HD Q-PAC® in the system has eliminated all odor complaints from the neighbors, but also because the media and system blend in with the appearance of the lift station. Additionally, the media and system cost well below the annual cost of chemicals (\$50,000) as previously noted, made the system the most cost effective odor control solution possible for the municipal water treatment authority.