

October 2013

The Wastewater Insight

MYSTERY BUG OF THE MONTH



We started this month out with a new **Mystery Bug of the month!**

Check out our website for more photos of our new mystery bug!!!!

EnvironmentalLeverage.com

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How can you increase oxygen in your system regardless of the piece of equipment?

Bacteria regardless of where they are located have certain requirements. The Critical 5 are important from the minute the wastewater leaves the direct source. Bacteria will grow in channels, wetwells, and collection systems all the way through to the final discharge. One of the most important things that can help in biological degradation is mixing and oxygen.

Typical Oxygen requirements in a wastewater plant

- 5 lbs. oxygen oxidizes 1 lb. nitrogen
- 3 lbs. oxygen oxidizes 1 lb. carbon
- 1-1.5 lbs. oxygen oxidizes 1 lb. B.O.D.
- 1 lb. oxygen oxidizes 1 lb. hydrogen sulfide
- .67 lb. oxygen oxidizes 1 lb. manganese
- .4 lb. oxygen oxidizes 1 lb. iron

It is your job to manage the conditions everywhere in your system so you can select for the right type of bacteria to grow in each environment.



In a **lift station or wetwell** mixing and aeration is critical. Some lift stations are designed to introduce the flow from a higher point than the level of the float, thus allowing gravity to help introduce water as the water splashes down into the lift station.



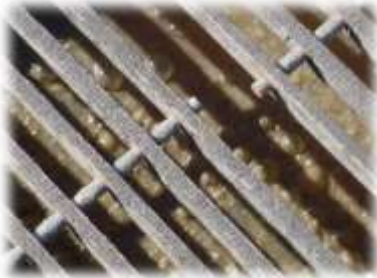
Some lift stations have such low flow, that many times the water can sit for hours or days and turn septic. In situations like that, adding a small mixer or recirculation pump with a venturi can easily help keep the water from turning septic.





EQ tanks are another area where mixing and air are critical so that solids cannot settle on the bottom and turn septic. Addition of mixers or aerators are obviously the best choice but when the tanks are too small or budget constraints limit what you can do, a small home-made recirculation system can also help. Use a small pump, some pvc pipe and a sprayer.

Here are some examples we have seen installed in very small systems. Influent lines can be retrofitted with a venturi also to introduce additional air into the line and bump up the D.O. a little bit.



Channels and pits also must be kept clean, whether with manipulation of gates and flow, daily cleaning or automated sprayers. Channels can turn septic or build up solids if things are not kept moving.

Aeration basins



Municipalities can't avoid grease usually. So they have to try to deal with the foam and filaments that can occur from grease such as Nocardia. Sprayers can knock down the foam. Pretreatment with bioaugmentation upstream though is often a better choice.

In smaller plants or plants that get extremely high swings in BOD loading such as food and beverage, sprayers can serve as a dual purpose. The sprayers disperse the wastewater to knock down any foam that may occur, as well as adding extra mixing and aeration.



Here is a good example of pre aeration at the discharge point of the aeration basins prior to the splitter box.





Clarifiers are notorious for running out of air if the solids sit too long. Gassing and ashing can increase TSS and cause permit violations so air is critical to success in a clarifier.

A venturi in the line from the aeration basin to the clarifier can help. Increasing aeration at the back end of the aeration basin prior to sending the MLSS to the clarifier can help. Other options we have seen would be sprayers using only the clarifier effluent to knock down the floating solids and add a bit more air.



Here is a poor man's sprayer- a hose with a sprinkler!



Digesters - One of the biggest issues we see in digesters is there is usually poor mixing, aeration or they turn the air off too long to settle and decant. Oxygen and pH are still part of the critical 5 and can make a huge difference in solids handling in digesters.



Final Effluent

Many facilities have final effluent permits with a high DO limit. Some plants waste a ton of electricity in the aeration basins with additional aerators to allow them to carry through higher D.O. residuals down to the final effluent. Instead many plants use stair steps at the final effluent weirs to allow gravity to add extra aeration to their final effluent.

Lagoons or ponds

Mixing and aeration are just as critical in lagoons and ponds, especially if algae becomes a problem.

We have seen other plants where they just added a small splash plate at the end of influent pipes or RAS lines to spread out the flow as well as add a little extra mixing and aeration. We discussed different ways to add air naturally by creating splashing, fanning or waterfall effects to the influent or return piping in the aeration basin or lagoons. A waterfall effect will also add oxygen to the mix.



Think simple, if you can add anything, anywhere to splash outwards. This affect will add oxygen to the lagoon and add turbulence to the surface to assist in preventing septicity.



Fountains, waterfalls, recirculation pumps with a venturi in the line also will help. Whatever way you can use to keep things moving, mixed and aerated will always help!

Upcoming

The Illinois Association of Water Pollution Control Operators, will be having their 78th Annual Conference and Exhibition in Springfield the week of April 15th. There are a number of technical sessions and equipment exhibitions to check out, along with their awards ceremonies and banquet. Please show your support for this wonderful group and set aside some time to attend this coming April. Please see the attached PDF for more details and registration information.

2013 Fox Valley Operators Association Board

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Dan Langguth

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Vice-President

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Visit Us At fvoa-illinois.org

Tracy Finnegan will be teaching a pre-conference workshop Monday morning

The workshop will be on Monday April 14th, from 10:00 – 12:00 at the Crowne Plaza in Springfield, IL


ALSO

There is still room to sign up for the one day/two day Seminar in Washington

[CEU Credits apply to certain licenses.](#)

Date Oct 21, 2013 Time 8a - 4:30p Fee \$175 payments after Oct. 15th—add \$25

Location

Hilton Garden Inn Tri-Cities/Kennewick
701 North Young Street
Kennewick, Washington 99336
Lunch will be provided by 

This seminar will present wastewater operations overview, training, troubleshooting and microscopic laboratory techniques necessary to control the wastewater treatment process with an emphasis on process monitoring and troubleshooting. These approaches are equally applicable to domestic, agriculture and industrial facilities. Past participants from industries such as dairy, refining, petrochemical, meat packing, wineries, food processing and pulp/paper have been successful in applying these methods to control their processes. Please bring a MLSS sample of your system.

2nd day seminar - CEU's available where applicable for drinking water as well as wastewater operator license

Date Oct 22, 2013

Time 8 :30a- 4:30p


Fee \$75 payments after Oct. 15th—add \$25

Location

Hilton Garden Inn Tri-Cities/Kennewick

701 North Young Street

Kennewick, Washington 99336

Lunch will be provided by  CARBON ONE

This seminar will present information on environmental issues such as air, solids, water and wastewater. Some issues

covered will include Lagoon Troubleshooting, Nuisance Algae control, Winery Wastewater, Dairy Operations, Beneficial

Reuse and Biosolids Land Applications. Each attendee will receive complete class notes and a Wastewater Training CD

Register for both seminars for \$250

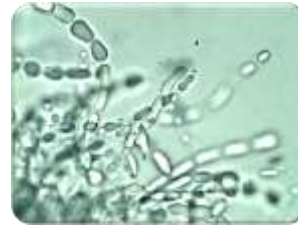
by phone 630 906-9791 fax 630 906-9792 or online

Registration Forms @ EnvironmentalLeverage.com

<http://www.environmentalleverage.com/newsletters/classes/Training%20classes.htm>

Last Month's

MYSTERY BUG OF THE MONTH



Mystery Bug of the month!

Last Month's Bug of the Month

Did you guess what this was? NO it is not a filament but actually fungi.

Similar at first glance but the cells are significantly larger and branched. Fungi usually means low pH in your system so check for areas where septicity might be occurring and dropping the pH.

[September 2013 - Fungi](#)

Check out our website for more photos of our new mystery bug!!!!

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