

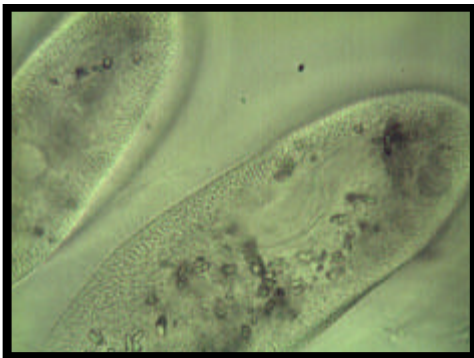


March 2009

# The Wastewater Insight

The wastewater insight

## MYSTERY BUG OF THE MONTH



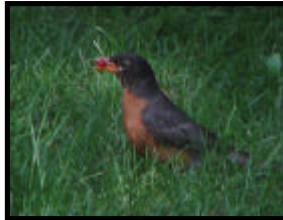
We started this month out with a new **Mystery Bug of the month!**

Check out our website for more photos of our new mystery bug!!!!  
[WWW.EnvironmentalLeverage.com](http://WWW.EnvironmentalLeverage.com)

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## Spring is just around the corner.



The first Robin of the season just showed up. Although that may make us a bit happier,

technically, it means wild weather swings for the next few weeks or months for your wastewater treatment plant.

Snow can still hit at any time, upsetting your plant, changing temperatures and making it harder for the bacteria to achieve BOD and TSS degradation.

Snow melts can also cause an overload of water to the system if you have runoff from industrial plants, CSO's or infiltration. This hydraulic overload can impact the loading to the system also.

Freezing and then thawing repeatedly can put wear and tear on the system, as well as create strange ice formations.



Frozen ice towers in a digester are shown below; this was an interesting phenomena. The bubbling action of the diffusers caused small formations to slowly build up and freeze.



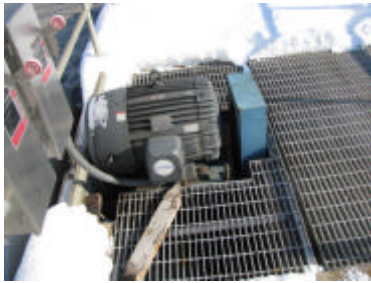
Safety can be impacted in winter or early spring. Snow on walkways and stairs can freeze and thaw and



make conditions slippery. Handrails, walkways, stairs can also ice up.

**Be careful with salt.** We had one plant use too much salt onsite, and the melted runoff wound up impacting the biological activity. Salt will lyse the cells if the concentration is too high in the water, and it will kill the bacteria. BOD and TSS will significantly increase.

They used 500 lbs to help empty some tanks, but still the smaller the plant, the less salt it takes to upset the bacteria in the system.



Build-up around pump and aerators can make mechanical equipment harder to run or easier to break down.



Ice build-up on wires and hoses



Channels can freeze up and block the flow

The biggest issues at the end of winter and the beginning of spring are heavy flows.





Not only can this cause hydraulic overload, but many times, especially for municipalities, it can wash excess solids or grease from the pipes and collection systems.

Grease can make its way through the pipes and cause blockages.

The biggest thing with excess grease is the overload to the wwtp



which can cause increases in foaming and filamentous bacteria. Foam will freeze quicker and can cause many problems.



Maintenance of frozen foam is not fun~



Whether it is in the aeration basin, channels or in the clarifier, foam and filaments due to grease rises to the surface, does not mix well, sits there longer and eventually freezes on the surface.

One way to get rid of grease is to supplement temporarily with bioaugmentation products to help reduce the grease loading.

Biological activity increases and decreases with temperature changes. For every 10°F- change, the activity of the bacteria changes one logs growth. Make sure that you are prepared for the decrease in activity as the temperature cools down. D.O. requirements will decrease as activity goes up, so you may be able to save some electricity and run your aerators at a lower speed. Nutrient addition applicable at your plant will decrease. MLSS values will need to be adjusted and possibly raised in

your system. Clarifier beds need to be monitored and adjusted and they might need to be higher, since you will need to carry a higher inventory if your plant gets serious impact from cold weather. pH will need to be monitored as activity decreases. Nitrification may slow down. If this is critical at your plant, you need to be very aware of this.

Some plants, especially industrial facilities that are out in the middle of nowhere and get extremely cold temperatures, often use steam injection directly into the basins in order to keep the biological activity up. The steam will kill the bacteria that come in close contact with the direct injection, but the overall increase in temperature across the system significantly increases biological activity.

Many plants can also experience an upset condition with dispersed growth and filamentous bulking every winter when colder temperatures promote the growth of some filaments such as *Microthrix parvicella*.



Many plants with lagoon systems that do not have the ability to increase their RAS and decrease their WAS in order to build up a MLSS in the system turn to bioaugmentation during the winter months. This is a very cheap, efficient way to increase the

amount of bacteria in the system and increase the degradation capabilities of the system.

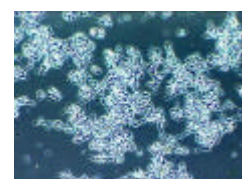
The bacteria are fed based upon flow, temperature and BOD loading and are only used to take up the slack that the existing bacteria in the system cannot handle. They are then discontinued during the warmer months.

Bioaugmentation is also used to supplement tank remediation, industrial facilities with activated sludge, but with extreme changes in flow and BOD loading that are so significant that the RAS cannot be changed quickly enough to help with the additional loading.

Be careful with MLSS numbers also. If you wind up with filamentous bacteria vs. floc formers, your "MLSS" numbers may give you false impressions of how many bacteria you really have.

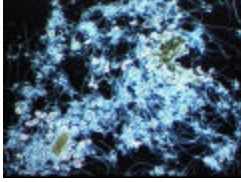
Floc that has filaments is going to take up 3-5 times the volume of mass that floc formers take up. You are not getting 3-5 times the treatment; there are holes and spaces in the volume. Imagine a sponge with a lot of spaces. If you use volume or mass balance as a way of measuring MLSS, keep this concept in mind. Check under the microscope. You may need more mass or active bacteria to do the same amount of work! [See our Wastewater Operations newsletter-8-06](#)

Use your microscope daily, it is more accurate than any numbers can ever get close to! The bugs will change quickly in hours and react to any spill, and will tell you long before there are major problems.



Think about it, their life span is generally 20 minutes to 2 hours. They will react quickly and indicate changes needed.

If you need to keep a medium to older sludge age, instead look at your floc structures, whether you have stalked ciliates and rotifers vs. rotifers and worms.



Base your solids and wasting schedule on what the bacteria are telling you as opposed to what a calculator is telling you! The bacteria could care less what the numbers say on your calculator.

Use the microscope! Then make adjustments!

**If you are interested in an audit of your plant, microscopic analyses, training or consulting on how to handle things in the winter or want to start a bioaugmentation program, call Environmental Leverage Inc. today!**

Correction to previous email that was sent out with information on our 2009 upcoming public classes-

## Biological Wastewater Treatment Seminar

Activated Sludge Systems

Original date was Saturday May 9th

It has been changed to

**Thursday May 7<sup>th</sup> 2009**

**Register early, class size is limited!**

**No refunds after May 1st, 2009**

### General Information

Registration/check in is at 7:30 a.m.

Downers Grove Sanitary District  
5003 Walnut Ave  
Downers Grove, IL 60515  
Phone: 630-969-0664  
Fax: 630-969-4913

A Seminar Sponsored by

**Environmental Leverage Inc.**

**Downers Grove Sanitary District**

Thursday May 7<sup>th</sup>. The course begins at 8:00 a.m. and adjourns at 3:30-4 p.m.

Environmental Leverage  
812 Dogwood Drive  
North Aurora, IL 60542

Lunch will be provided compliments of **Downers Grove Sanitary District**

### Registration

You may register by mail, telephone or fax:

Fax: (630)- 906-9792

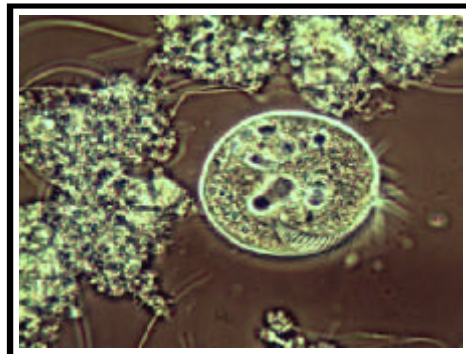
Phone: (630)- 906-9791

**Please email us if you need a registration form.**

**Please let us know if you have any questions**

We are in the process of setting up this year's schedule for classes. If you would like to host a class at your plant, please contact us.

Last Month's  
**MYSTERY BUG OF THE MONTH**



Last month's bug was a type of crawling ciliate-Euplotes

**Mystery Bug of the month!**

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

[WWW.EnvironmentalLeverage.com](http://WWW.EnvironmentalLeverage.com)

**COMING IN THE NEXT MONTHS . . . . .**

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