

## ***Wastewater Treatment Insights for the Pulp & Paper Industry***

**2009 Number 4**



Consulting Services



Laboratory Services



Wastewater Training



Biological Products



Nutrient Blends

### **An update on EBS: To be or not to be; that is the question**

*To be, or not to be: that is the question: Whether 'tis nobler in the mind to suffer the slings and arrows of outrageous fortune, or to take arms against a sea of troubles, and by opposing end them? To die: to sleep. William Shakespeare (partial text from Hamlet 3/1).*

Do you remember this from school? There is more to the poem but the first part holds meaning for EBS. In our case, we have thought over the past year, "To invest or not to invest; that is the question." And it's an important question considering today's economic condition and the plight many of our paper clients are experiencing.



#### **Trivia Questions**

1. What piece of equipment is needed to measure the solids inventory in a secondary clarifier?
2. Name the four categories that are the root causes of filamentous bacteria.
3. Name two causes of poor settling in an activated sludge secondary clarifier.
4. In what board game is the object to amass armies and conquer the world?
5. In the TV show "Lost", John Locke makes a direct reference to one of the most popular films of all-time, in the episode entitled: "The Man Behind the Curtain." Which film is it?
6. What are the holes in Swiss cheese called?

After much consideration, Mike and I decided that the appropriate course of action for EBS was to leverage our recent success and aggressively invest in the future. Will some consider it outrageous fortune to experience doors that have opened as a result of bankruptcy filings? Perhaps, but our company was built on assisting clients with difficult situations and helping ensure they stay in environmental compliance. Or should we oppose the sea of troubles companies continue to face? For to do so is surely to stand still philosophically as well as technically and start to die.

Consequently, EBS added five employees with a diverse skill set since mid-August and four additional part time individuals started in 2009. This allows EBS to offer better coverage at some client locations more remote to our Louisiana headquarters. But more importantly it allows EBS to expand our offerings to you. We now have expertise in storm water management, safety training, and bilingual employees in the languages of Spanish, Portuguese, and French for training needs. We will continue expanding our lab capabilities and looking into certification. And further capabilities will be reviewed as this expanded team of experts evaluates marketplace needs. Take a look at our new employees on our website under <http://www.ebsbiowizard.com/staff.html>. We are duly impressed with our staff both personally and professionally.

Thus we may come to you and ask what your needs are. If you see a need in the environmental arena, we want you to challenge us to evaluate its potential. So please call or email us and tell us what environmental holes you think are a potential fit for EBS.

#### **In This Issue**

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- Ask the Biowizard: Preparing your system for cold weather
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## Ask the Biowizard™: Questions posed by mill personnel

### *How can I get my system ready for cold weather?*

Bacteria prefer warmer temperatures and they do not reduce BOD or multiply as effectively during the colder months of the year. Due to this, mill upsets are more problematic during the winter. While temperature is one of the eight growth pressures that affect your WWTP, there are things you can do ahead of time to ensure your system is as healthy as possible when upsets occur.

- **Increase nutrient feed rates to maintain sufficient nutrient residuals.** Typically these residuals should be 0.3-0.5 for both nitrogen and phosphorus in an ASB and 0.5-1.0 for an activated sludge system. Nutrient residuals must be measured in the active form of nitrogen and phosphorus or as ammonia with phosphate as orthophosphate. Nutrients are necessary for bacterial reproduction and thus nutrient requirements increase when the BOD loading increases. With proper nutrient control your system is more robust and won't require as much time to gear up when an upset does occur. This is particularly important in the winter months when bacteria multiply at a slower rate. Increasing nutrient feed rates during an upset to maintain nutrient residuals is important in maintaining a healthy biomass. MacroGro™ blends of nutrient supplied by EBS provide a customized blend of nitrogen and phosphorus to meet the specific nutrient percentage needs for your mill.
- **Know your retention time.** BOD reduction takes longer in the winter and thus ASB retention time becomes more critical. Knowing this retention time and its characteristics (channeling, aerator placement effectiveness, etc.) helps when responding to upsets during the colder months. The area of greatest BOD conversion will most likely occur at a point further downstream in your ASB.
- **Bioaugmentation.** Since the bacterial population will struggle more in the winter, proactive bioaugmentation can help maintain the strength of the microbiology. EBS's Bacterial Acceleration Chambers or BAC units are useful for these reasons. First, use of the BAC unit gives the dry bacteria in EBS's BioStar P™ or MicroStar™ time to come off the bran and out of their spore form. Moreover, the EBS BAC unit provides an opportunity for the bacterial population to multiply 100-1000 times before they are ever added to the secondary system. These advantages have the benefit of creating a situation in that when the bacteria are dumped from the BAC unit into the secondary system, they start reducing BOD more quickly and closer to the front end of the system. This increased exposure to a system's full retention time (as opposed to part of it which occurs when bags of bugs are thrown into a secondary system's influent zone and take a day's worth of retention time to finally start doing their job) helps further reduce BOD levels. Additionally, these advantages allow for higher levels of bacteria to enter the secondary system influent zone while reducing the quantity of dry bacteria used which reduces cost. The following link to our website will provide more information about the EBS BAC unit: [www.ebsbiowizard.com/literature/BAC\\_Unit\\_Brochure.pdf](http://www.ebsbiowizard.com/literature/BAC_Unit_Brochure.pdf).
- **Other Growth Pressures.** The other growth pressures: dissolved oxygen, type and amount of food (BOD), toxicity and inhibition, and pH will also impact the WWTP. Recovery from these upsets will be slower during the winter.

EBS is uniquely capable of responding to your winter upset issues because of our experience and ability to mobilize personnel. To learn more or discuss how you can be proactive for your unique mill, please call us at 985-674-0900.

## Employee Spotlight:

### ***Kermit Francis – Wastewater Project Specialist***

Kermit Francis joined the EBS team in April of 2008 as the Wastewater Project Specialist. Before joining EBS, Kermit had significant professional experience in the environmental field, working as an Environmental Scientist for the Louisiana Department of Environmental Quality, a Biologist for The Shaw Group and as an Environmental Sanitarian for Anne Arundel County, Maryland Department of Health. He brings experience from both the public and private sector to our company.

As a wastewater project specialist, Kermit heads all special projects for EBS clients. These projects include depth and tracer studies of aerated stabilization basins and respirometry treatability studies. Kermit is also in charge of the Pearl River water quality and fish characterization studies that are conducted for two area paper mills. The findings from all of these projects serve as cumulative historical data for our clients and allow our company to make recommendations for improving a client's wastewater treatment system.

Kermit received his Bachelor of Science in Biological Sciences from the University of New Orleans in 1999. He lives in New Orleans and enjoys nature and the outdoors, as well as our New Orleans Saints!



## Bioaugmentation: Periodic System Evaluations

When operating a wastewater treatment system, it is important that you have a complete analytical evaluation run on your system routinely. This not only allows you to verify testing by onsite labs, it provides background data for troubleshooting system upsets. The EBS lab can provide this analysis and use the information to evaluate system efficiency.

This testing includes basic permitted analyses such as BOD, TSS, and COD as well as some process monitoring analyses such as DOOR, settling, and nutrients. Reports are tailored to meet client needs and our comments or recommendations will reflect the issues your particular plant faces. Analyses run during normal as well as upset conditions enable us to determine how stressed the system is during an upset as compared to routine background data. This gives you a head start on helping your system recover quickly and efficiently.

The analyses usually include a full microscopic evaluation to enable us to assess the health of the system and calculate a maturity index as explained in the 3rd quarter newsletter. The microscopic evaluation includes pictures, or micrographs, of the floc and higher life forms as well as any filamentous bacteria.

EBS recently purchased a new microscope camera with updated technology which will enhance the picture quality of the microbial components. Furthermore, EBS recently added plate counting and oil & grease testing to our capabilities. We are happy to assist with these analyses if you face problems with O&G or low bacterial counts.



For an example of a typical in-house service report, please visit our website at [http://www.ebsbiowizard.com/laboratory\\_services.html](http://www.ebsbiowizard.com/laboratory_services.html).

## Making a Difference in our Community

*EBS is a strong proponent of giving back to the community. To encourage this activity among our employees, we engage in a variety of activities and will highlight one in each newsletter.*

EBS participates in the Mandeville, Louisiana High School Field Internship Program. This program was designed for seniors to give students a more in-depth look at their career interest through hands-on experience. It involves the "hiring" of an intern or student by a mentor within the community who teaches the student a trade. The high school senior not only obtains a taste of all aspects of that career but is an asset to the mentor. EBS is in our second school year of participation with the Science Internship program. Our 2008-2009 Intern was Elissa Waterman, a senior from Mandeville High School, who is in Louisiana State University's Honors Collage to study in the Pre-Medical department. Adelaide (Della) Hebert is our 2009/2010 high school senior program intern. During this program, Della will work with EBS two days per week part time throughout her entire senior year to complete the program. She will learn chemistry, microbiology, routine laboratory tests, field analyses of client samples, and the science behind wastewater treatment.



## Name that Bug



Answers on page 4

## Look for EBS on Facebook

<http://www.facebook.com/home.php?#/pages/Mandeville-LA/Environmental-Business-Specialists-LLC/150969144495?ref=nf>

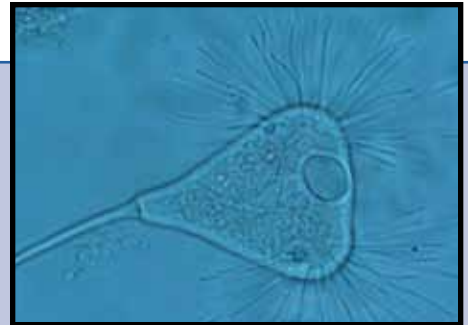
**EBS Spring Seminar Dates  
are April 27-30th, 2010.**

## Name That Bug ... Suctorina

### *Tokophrya mollis*

*Tokophrya mollis* is a suctorian commonly found in wastewater systems as well as marine and freshwater systems. The family is often periphytic (attached to substrate) or attached to aquatic invertebrates. The feeding spines are arranged in two groups on either side of the triangular body. Suctorians are predatory using their spines to capture other higher life forms and suck out the nutrient rich cytoplasm of the captured organism. Suctorians comprise approximately 7% of all ciliates described to date and are a very diverse group of higher organisms. *T. mollis* generally ranges in size from 100 to 200  $\mu\text{m}$ . The majority of suctorians are non-colonial, as is the case with *T. mollis*.

During adverse environmental conditions, *T. mollis* will break away from the stalk to seek out a more favorable habitat. During this stage, the morphology of *T. mollis* changes, where the body reabsorbs the spines and extends cilia in order to move freely in the water. After locating a favorable substrate, *T. mollis* reverts to its more common morphology. Mature *T. mollis* in its stalked morphology is indicative of a stable, healthy biomass.



Tokophrya Mollis

## TRIVIA ???

### Answers

1. A sludge judge or core sampler.
2. Low dissolved oxygen, low food-to-mass ratio, low nutrients, and septicity/organic acids.
3. Filamentous bulking, zooglear bulking, nutrient deficient slime bulking and young (underoxidized) sludge can result in poor settling sludge.
4. Risk.
5. "The Wizard of Oz". John is angry with Ben for not taking him to see Jacob. Ben maintains that Jacob only talks to him. In frustration, he tells Ben, "How convenient. You know what I think, Ben? I think there is no Jacob. I think your people are idiots if they believe you take orders from someone else. You are the man behind the curtain, the Wizard of Oz. And you're a liar."
6. Eyes. In order to make cheese you need bacteria. *Propionibacter shermani* is one of three types of bacteria used to make Swiss cheese, and it's responsible for the cheese's distinctive holes. Once *P. shermani* is added to the cheese mixture and warmed, bubbles of carbon dioxide form. These bubbles become holes in the final product. Cheesemakers can control the size of the holes by changing the acidity, temperature, and curing time of the mixture. Bacteria are used for everything!

Are you getting better at answering? Learning something also?

## CLEAN THOUGHTS™

*Wastewater Treatment  
Insights for the Pulp and  
Paper Industry*

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We would like to hear from you. If you have any questions, comments, or would like to ask the Biowizard a question, please contact us by phone, fax, or email.