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## Not all Foam is the Same

The common misconception is that if you have foam on the surface of your aeration basin, you must have Nocardia. There are numerous reasons why plants have foam. It could be due to any of these reasons: Nocardia, Microthrix, just too many solids, low D.O. and even zoogloeal bulking.

Case study example from a wastewater treatment plant that everyone said had to have problems with Nocardia or Microthrix. No one had ever looked under the microscope at the actual filaments or did a Gram or Neisser stain. In reality, this plant had too many solids in one of three basins and was also holding solids too long in the clarifier. The biomass had N. Limicola as the dominant filament. The plant needed to make a number of process changes as opposed to just "adding bacterial product" as a quick fix.

Process monitor and control were big recommendations to this plant. All three basins were "not alike" in reality. Flows to each were changed over the years as old pipes became clogged. MLSS was not measured in each basin. Too many solids in one of the basins that only had the foaming problem were detected. Changes to step feed were also recommended since the final basin was also low on F/M. D.O. levels were not checked in each basin. Small changes in that also helped create conditions that literally caused the filamentous bacteria to thrive when they finally reached the last basin in the process.

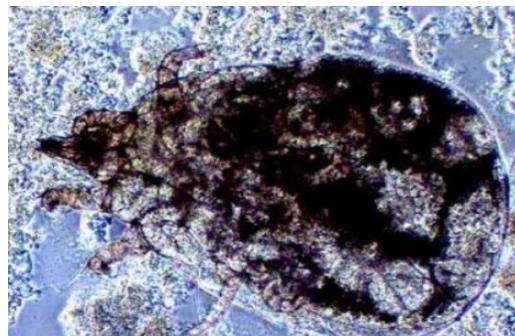
Walk through your plant and look for trouble areas. Are you creating dead spots in the primary that can cause problems? In the secondary, in the clarifier, in the sludge holding tank, digestors or in the dewatering and returned supernatant?

Not all foam is bad -but it usually indicates a condition that is going on in your basin. Learn what the colors mean.

The chart on back is a typical troubleshooting foaming chart- be careful though and use your microscope or you may make the wrong interpretation as to what is causing the foam and how to fix it. The problem with traditional troubleshooting charts, is they do not look under the microscope and account for the microbiology. Use your scope or have Eastex Environmental Laboratory perform a microscopic analysis for you.

Source for this newsletter: Environmental Leverage

## We Started this month with a new mystery Bug Of The Month



Can you guess what this is? Hint: You can see them with your naked eye. Sometimes brilliantly colored. Can indicate a solids build up somewhere or an old system.

*See answer on the back.*



**Congratulations** to our Client, Operator Gregg Lewis at the City of Elkhart for receiving an award at the Annual TCEQ DW Conference for Most Innovative and Proactive Water System

# Eastex Environmental Laboratory

## Troubleshooting Secondary Wastewater Treatment Systems:

<p><b>Foaming Problems</b> White, stiff, billowing or sudsy foam covering a large part of or the entire aeration basin.</p> <p>Shiny, thin, dark tan foam on much of aeration basin surface.</p>	<p><b>PROBABLE CAUSE</b></p> <p>a) Start-up or high BOD shock load condition resulting in high F/M and low MCRT.</p> <p>b) Excessive wasting or hydraulic washout.</p> <p>c) Toxic wastes or temperature shock.</p> <p>d) RAS flow too low or off.</p> <p>e) Excessive dairy fats, detergents or other foaming materials or surfactants.</p> <p>Aeration basin approaching under loaded (low F/M) condition due to insufficient sludge wasting (too many solids in the system).</p>	<p><b>CORRECTIVE ACTION</b></p> <p>a) Increase RAS or decrease WAS, do not waste until MLSS level comes up to proper F/M range. Maintain adequate DO levels (1 to 3 mg/l).</p> <p>b) Reduce wasting and adjust RAS until normal conditions are reached.</p> <p>Segregate storm water lines from process water collection system.</p> <p>Divert excessive flows to collection basin if possible for later treatment.</p> <p>Add hydraulic equalization basin.</p> <p>c) Re-establish activated sludge organisms. Waste sludge from plant if possible. Re-seed if possible (bioaugmentation). Re-establish normal temperature if possible or adjust MCRT if situation is to continue.</p> <p>d) Re-establish adequate RAS rate.</p> <p>e) Pre-treat with anti-foam or DAF. Improve primary oils and grease removal. Consider bioaugmentation to more aggressively degrade waste substrate.</p> <p>* Increase WAS rate (not more than 10% per day) until process approaches normal control parameters and only a modest amount of light tan foam remains on aeration basin surface.</p> <p>Check MLVSS, F/M and MCRT to optimize.</p>
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## Plants with foaming in the clarifier

<p><b>PROBLEM</b></p> <p>Thick, greasy dark-tan foam covering most of the aeration basin surface, and carries over to the clarifier (and sometimes over the basin sidewalls).</p> <p>Dark brown, almost black sudsy foam with detectable septic or sour odor. Mixed liquor is also very dark brown to black in color.</p> <p>Modest amount of fresh, light tan foam.</p>	<p><b>PROBABLE CAUSE</b></p> <p>Filamentous organisms (<i>Nocardia</i>, <i>M. parvicella</i>)</p> <p>a) Anaerobic conditions within the aeration basin.</p> <p>b) Industrial waste containing dyes or inks.</p> <p>Not a problem! Usually a sign of a well operated process.</p>	<p><b>CORRECTIVE ACTION</b></p> <p>Increase WAS rate (not more than 10% per day) to reduce MCRT. Normal filamentous control with chlorine or peroxide must include treatment (in water spray) and removal of surface scum (foam) in addition to RASS/MLSS as these organisms tend to concentrate in the foam. Check MLVSS and F/M ratio to optimize process parameters.</p> <p>a) Check DO levels in basin, and increase aeration / mixing. Reduce organic loading if possible.</p> <p>b) Investigate pre-treatment strategies.</p> <p>"If it ain't broke, don't fix it!"</p>
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Source for this newsletter: Environmental Leverage



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Mystery Bug Answer: **Watermite**