



EL Environmental
everage[®]
INC.



Turning Liabilities into Leverage



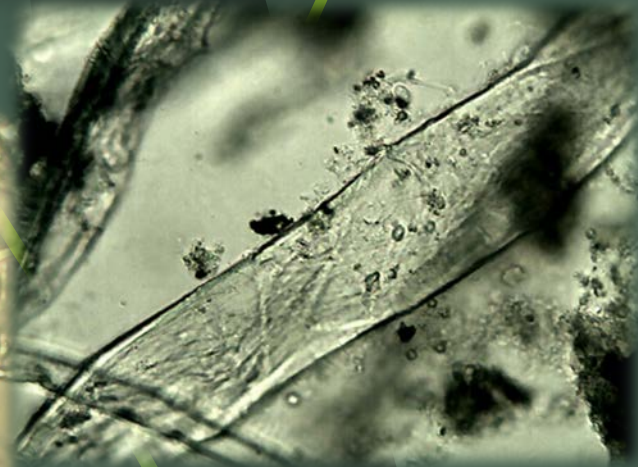
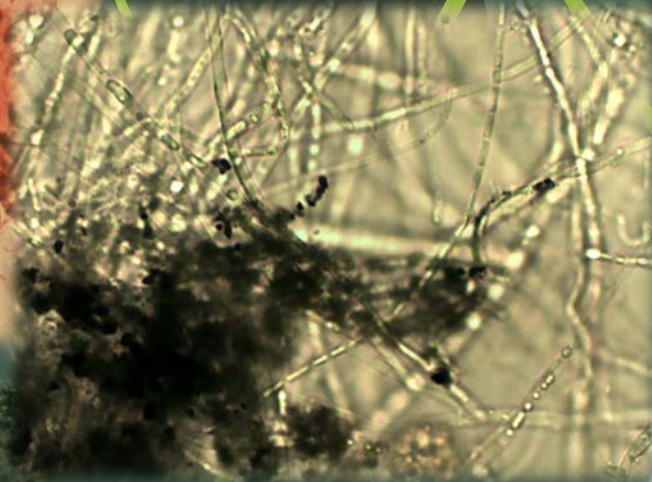
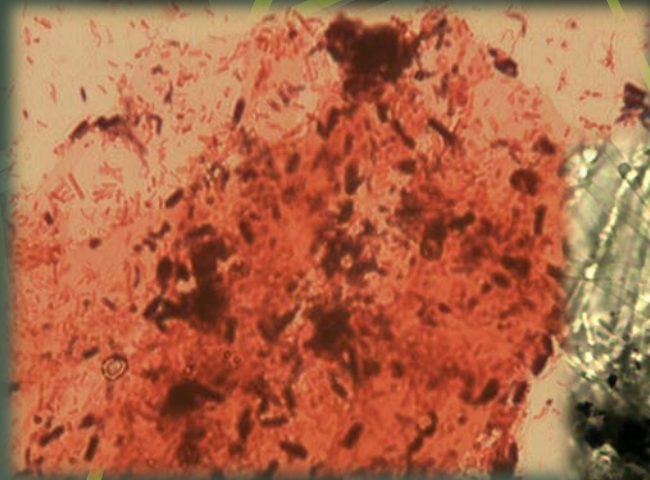
Troubleshooting in Collection Systems and pretreatment tanks

Use the Microscope

- Pull samples from Lift stations across your collection system whether in an industrial facility or in a municipality to narrow down the source of issues
- Check EQ tanks, Wetwells, scum pits, pretreatment tanks, Digesters and dewatering tanks



Use the Microscope

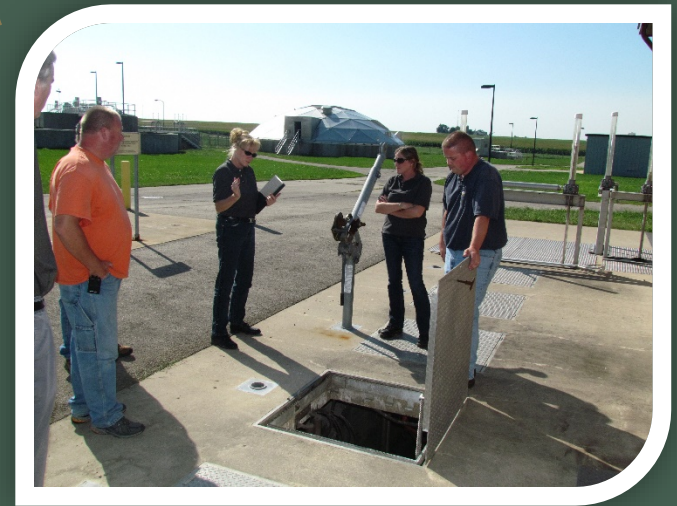


- Slime
- Fungi
- Fiber
- Filaments



Case History Examples

- Municipality in Wisconsin with food industry
- Municipality in Midwest with textile
- Corn Manufacturing in Iowa
- Municipality in California
- Dairy in Mississippi
- Bottling Facility
- Chemical plant in Louisiana
- Snack Factory East Coast



WI Municipality with industry

- Three lift stations
 - One industry
 - Two with strip mall and
 - Small neighboring city
- Use the microscope to see cause of plant issues

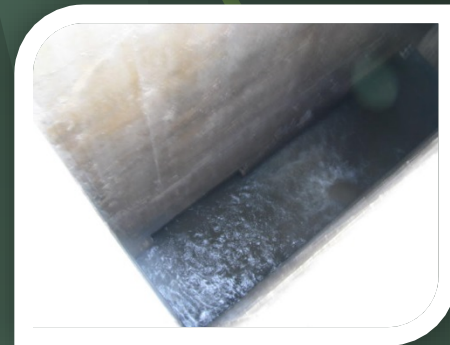


City Plant/Soy Sauce issues

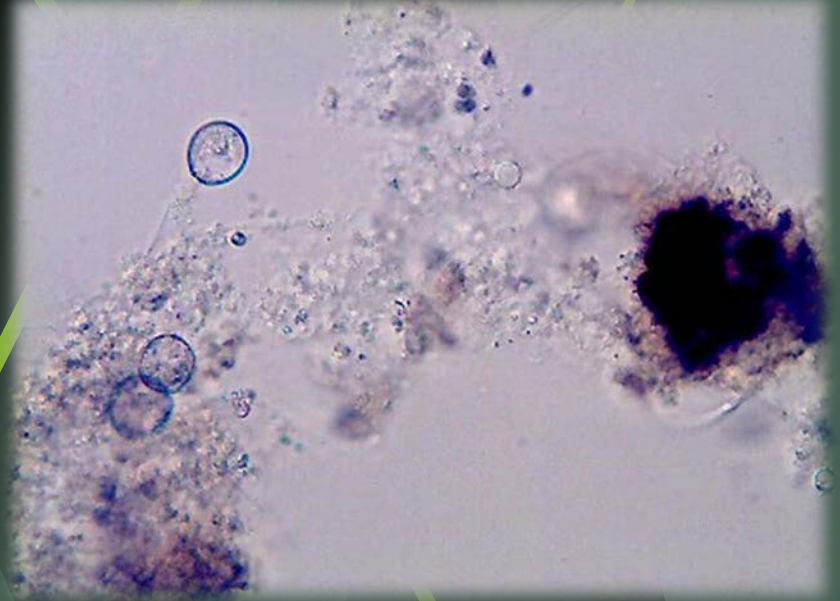
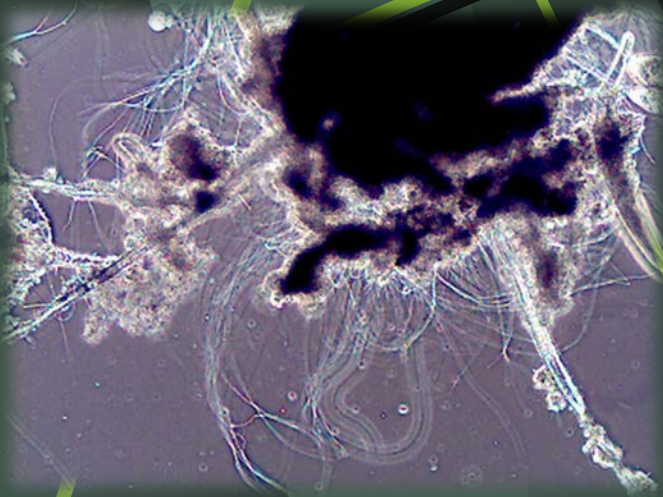


**City plant vs Food plant Pre Treatment
Issues with influent filaments**

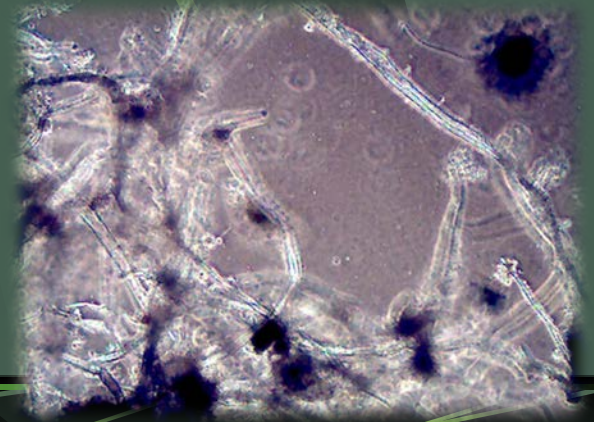
**Performed Lift station study
City influent vs Industrial
Strip Mall and local small municipality that sent water to Large City
Industry was not causing the issues but the local municipality
discharger lift station was turning septic and causing the issues**



Microscope study



Samples from lift stations
City
Soy Sauce
Strip Mall
Small neighboring
city that they treated



Municipality with Industry in Midwest

- Municipality blamed textile plant for fouling membranes and filters
- Intense engineering study across town and all lift stations- Chemical as well as Microscopic analyses performed
- Results indicate fouling coming from food plants on south side of town instead of Textile plant on North side

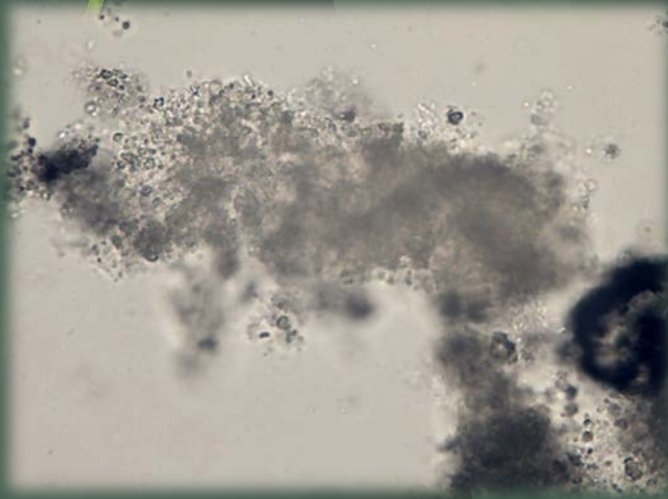
Microscopic analyses

Clarifier
Foam

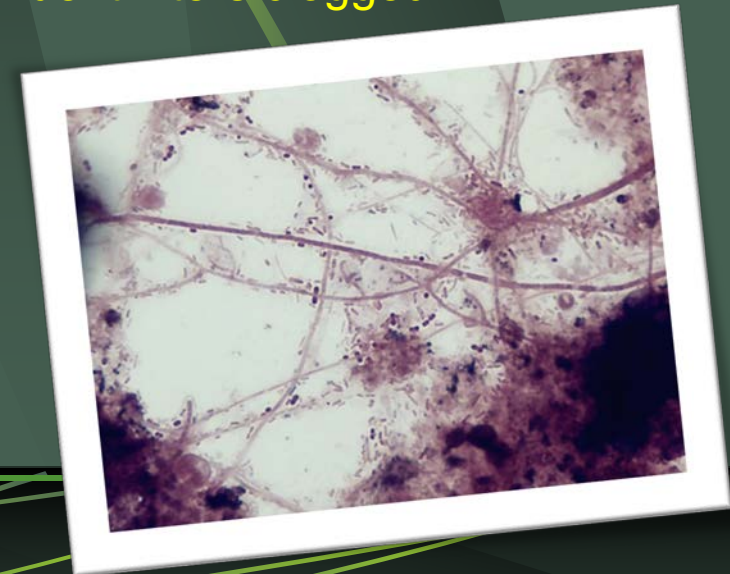


South
side lift
station

Textile plant



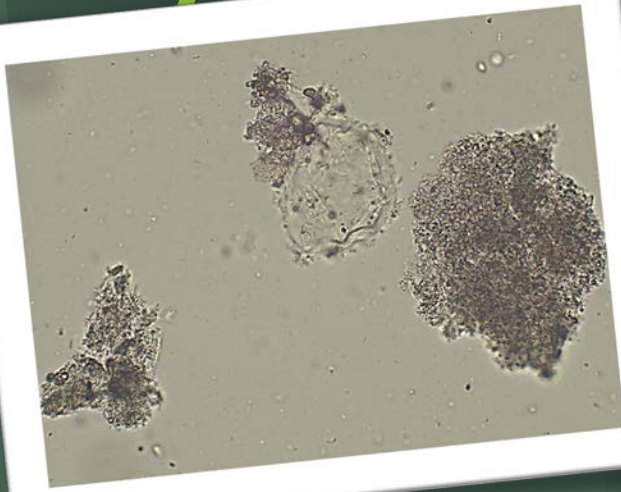
Final effluent filters clogged



**Textile plant not
causing main
issues at WWTP

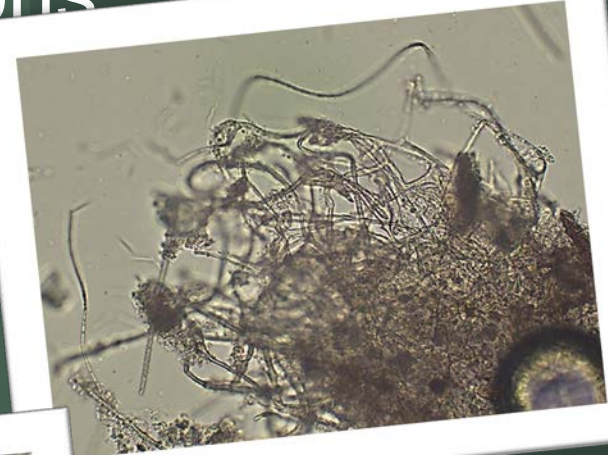
Municipality in CA with blinding screens

- Upstream check of lift stations

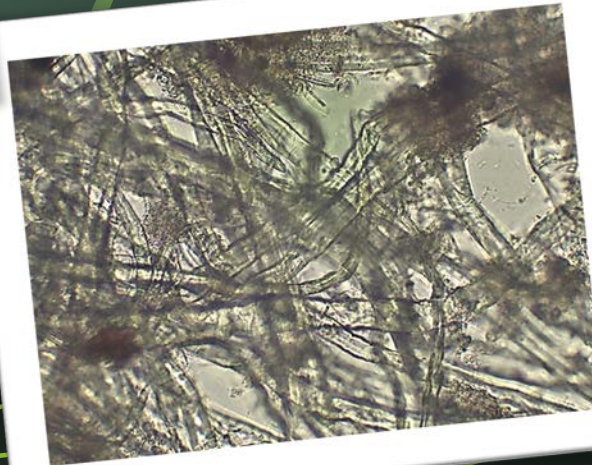


Lift Station #1
Normal debris and
biological growth

Lift Station #3
Excessive
Fiber, fungi,
black spots in
the biofilm



Lift Station #2
Fungi and
filaments and
signs of
septicity



BOTTLING and Beverage Facilities



Sometimes you don't even need the microscope, it is obvious with visual examination



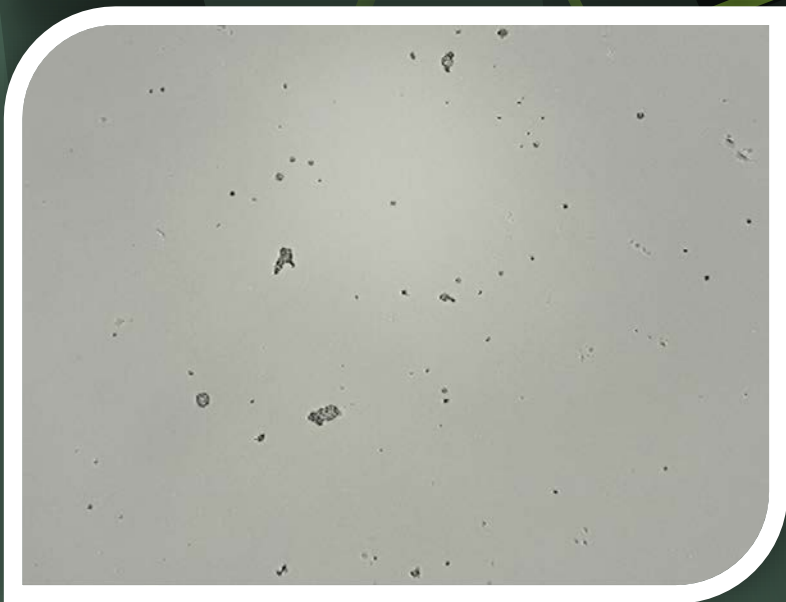
Lubricating oils from machinery as well as lift station near machine shop showed two different types of oil and grease



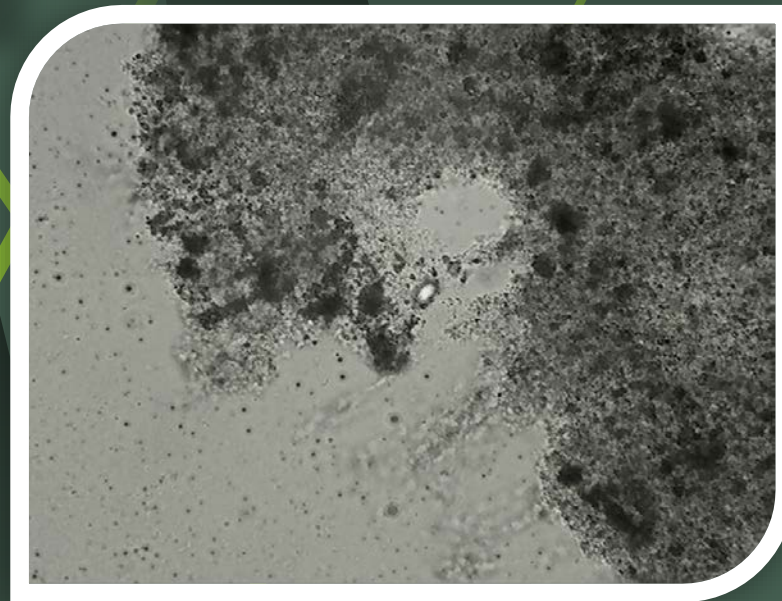
**Solution: Add
MicroBlocks to
wet wells**



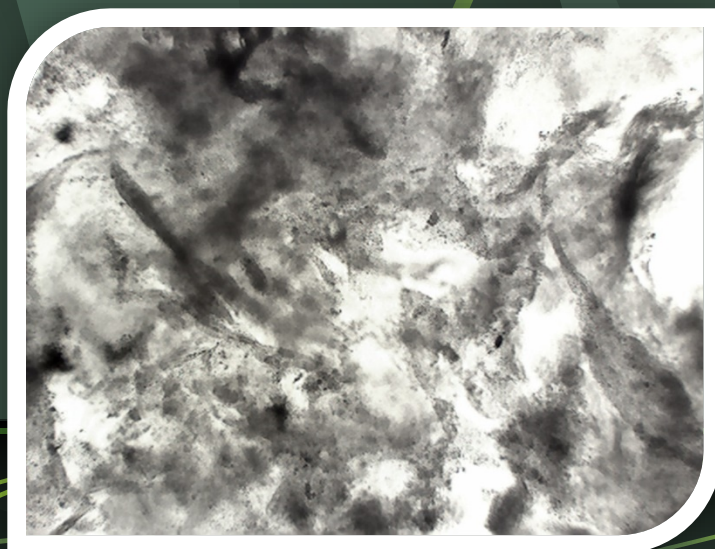
Chemical plant



Normal EQ tank



Effluent Disc filter



Sludge holding
tank/Digester

The back end of the plant not the influent was causing the issues as sludge and dewatering decant is returned to the front of the system

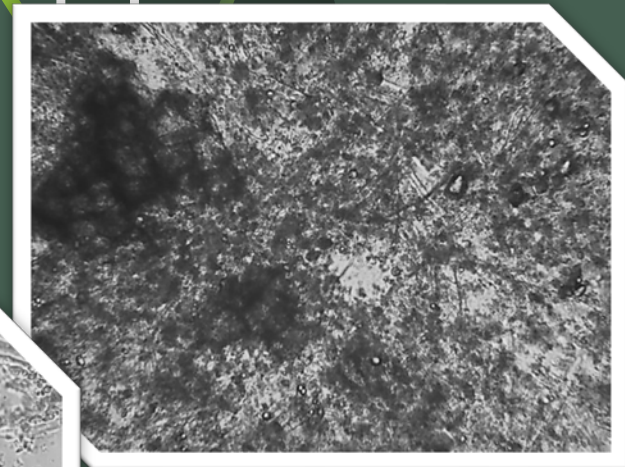
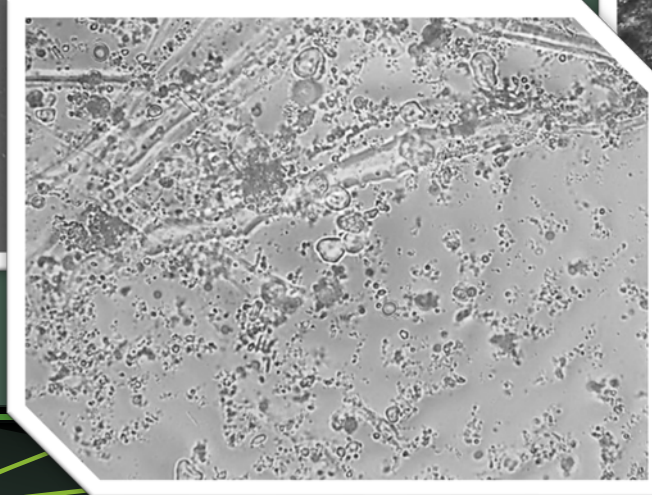
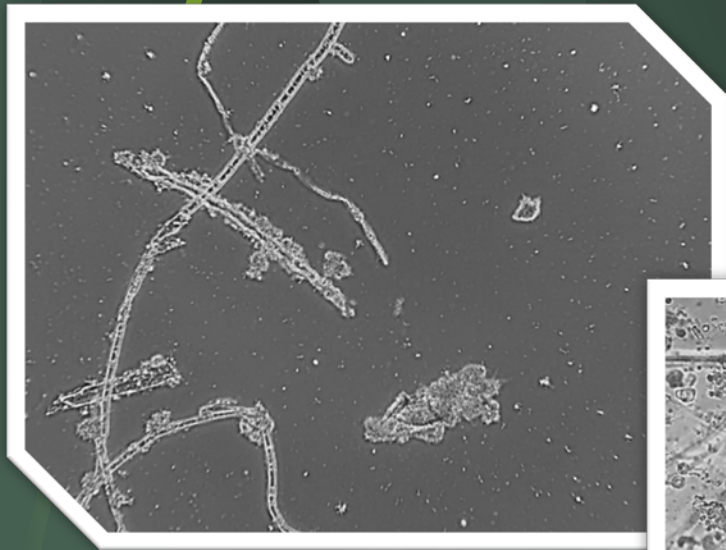
Dairy in Mississippi

- City kept blaming them for their lagoon issues
- The lagoons have no screening
- They have hotels, restaurants and a mechanic shop on one wet well #1
- Only the dairy on the second wet well #2
- High oil and grease in #1
- The city had recently jetted out the
 - collection system sewers and recoated
 - The pipes causing major slugs of oil
 - Grease, debris and septicity to flood
 - the lagoons causing major odors



Snack Factory East Coast

- Check upstream equipment such as Primary clarifiers, Wetwells as well as dewatering and downstream equipment
- Many times all the critical 5 are ok in the Aeration basin but not in the other pieces of equipment



Troubleshooting

- Check lift stations, primaries, EQ tanks, secondary clarifier, digesters and dewatering
- Check upstream equipment at industries
- Look under the microscope as well as use visual observations



Industry Equipment oils

Check upstream



Pretreat
with
Microblock



Restaurant Grease

High Temps - grease dissolved

Cools downstream

Clog lines

Back up water into kitchens



Papermill with Oil & Grease



Juice / Beverage Manufacturing Facilities

Although this plant had issues with oils and septicity, it turned out the municipality had issues with a meat packing plant closer to the WWTP causing more issues. Both plants had to pretreat their streams

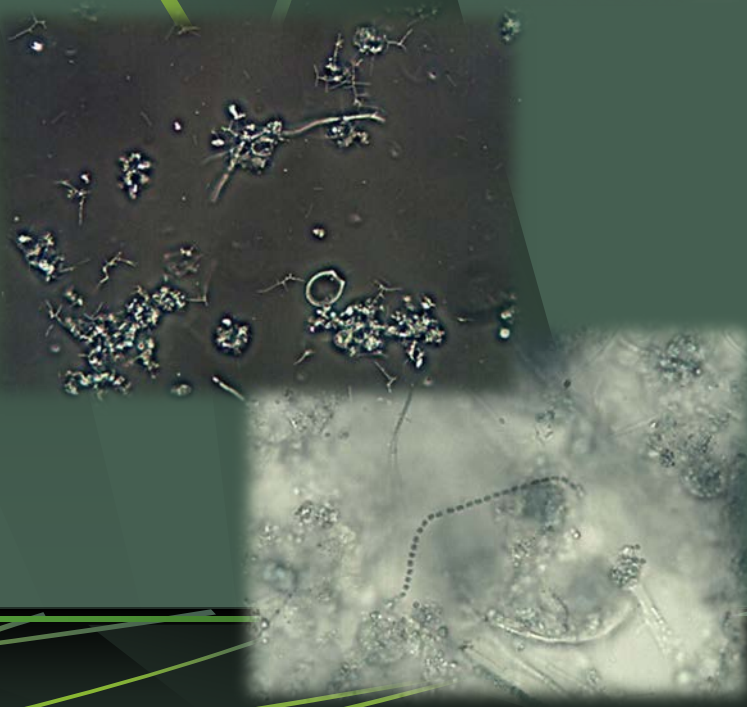


Pretreatment with Microblock at both, pretreatment for pH and ammonia addition as juice facility lift stations

Oils in Winery



Lubricating oils are used in wineries. Microblocks can be used in the lift station to pretreat the oils. A DAF was used as well at this plant.



Troubleshooting



Test results for .1 gram of grease from a primary clarifier

Analytical Report

Client: Amwell - A Division Of McNish Corp
Project ID: VA - WWTP PO# 64120
Sample Primary Tank #1 Pass 3
Sample 7-3986-001

Date 09/06/07
Time 10:15
Date Received: 09/07/07
Date 09/12/07

Results are reported on a dry weight basis.

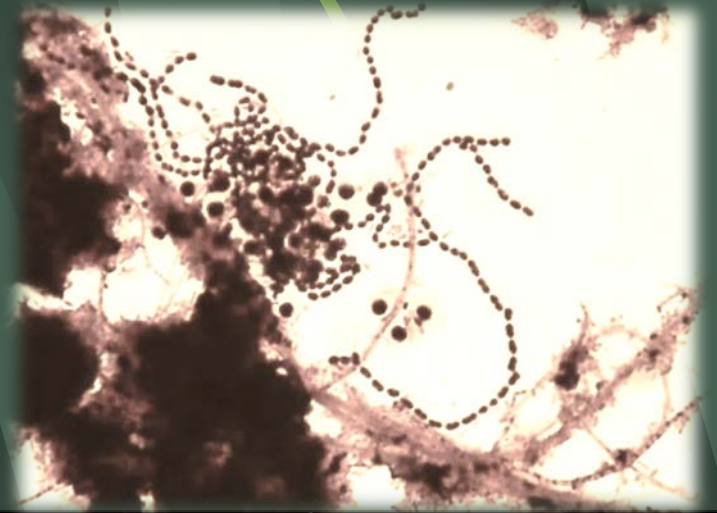
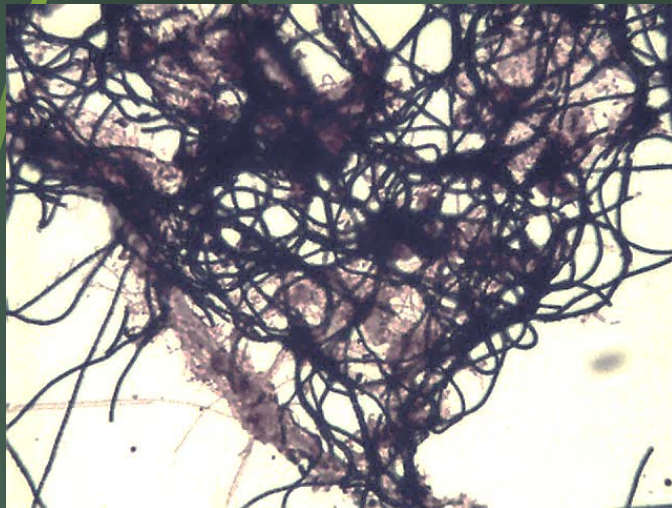
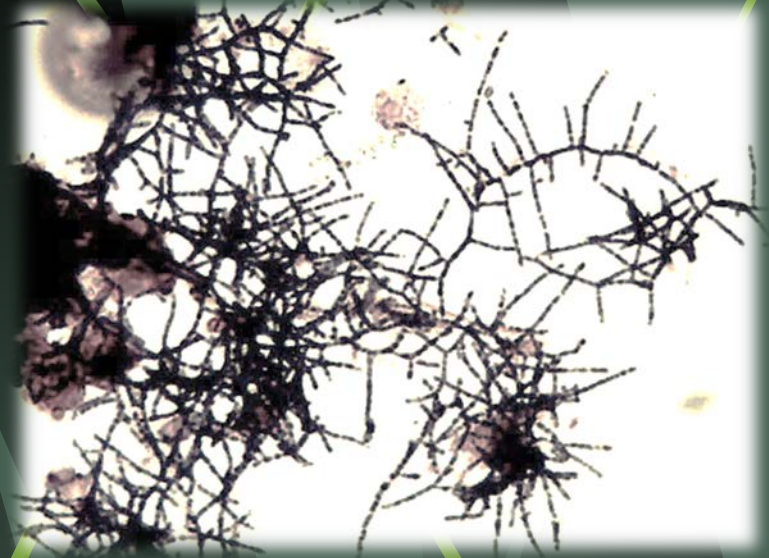
| Analyte | Result | R.L. | Units | Date Analyzed | Method | Flag |
|------------------|-----------|------|-------|---------------|--------|------|
| Oil & Grease | 748,000 | 10 | mg/kg | 09/12/0 | 9071B | P |
| Specific Gravity | 1.00 | 1.00 | | 09/11/0 | 2710F | N |
| COD | 3,690,000 | 100 | mg/kg | 09/10/0 | 5220D | |

Grease and Oil Filaments

Nocardia

M. parvicella

1863



Grease and Oil Causes



Lift
Stations,
Wet wells

Change in
temp 180-
210 °F for
restaurants

Construction
traffic

Industry-
process
equipment
leaks

Food
processing
Industries



Is it Nocardia?

All foam is not
alike

Different process
changes may be
required as a
solution

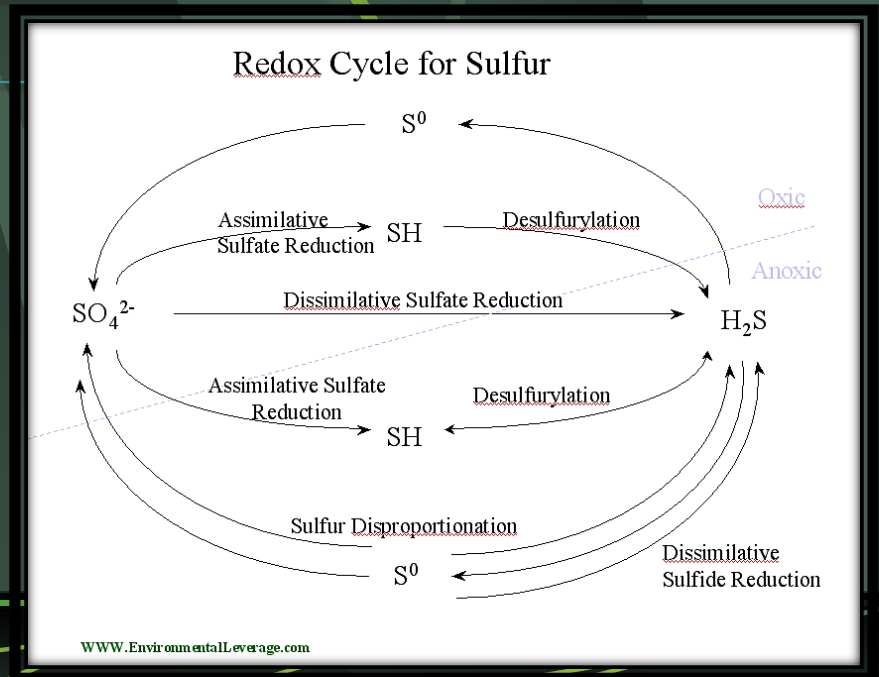
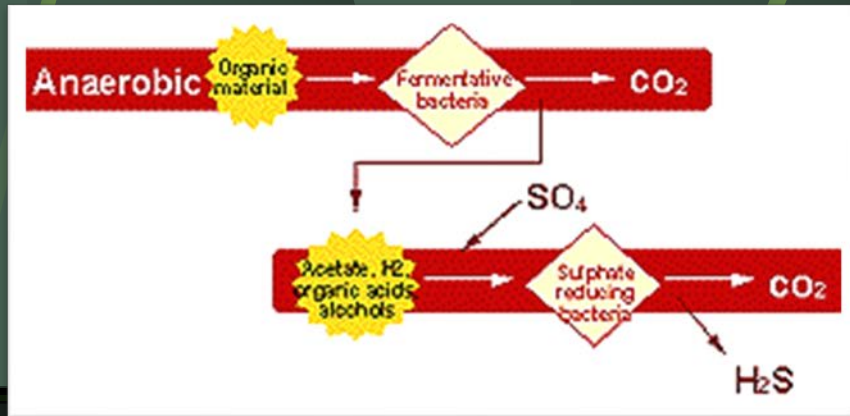
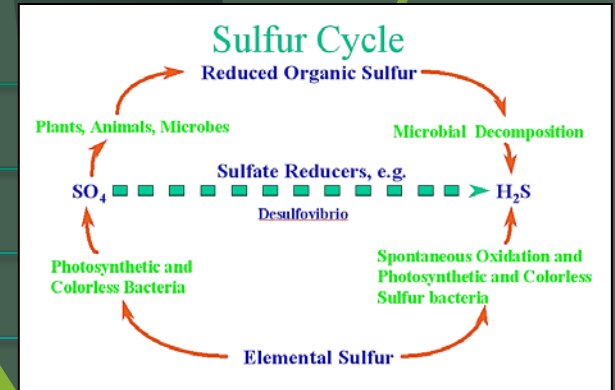


Septicity

Low D.O. & Septicity

Typical Oxygen requirements in a WWTP

- 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



New Equipment for air and mixing in Lift Stations

Check out
the internet
for new
Technology
To provide
air and
mixing
upstream in
wet wells,
lift stations
and holding
tanks



Lift Station Solutions

Bioaugmentation

Nutrients - N & P

pH Control

Mixing and Aeration

Upstream Pits

Venturi vs. mechanical Recirc Pumps

Raise float to Dissolve Grease Ledge

Critical "5"



Wastewater Audits

Full onsite audit of Treatment plant, or "Virtual Audits"
 Evaluation of Equipment, Process Recommendations, System Optimization,
 Troubleshooting, Testing, Solids Handling, etc.

The collage displays various components of wastewater audit reports:

- Top Left:** A report header with the company logo and project information.
- Top Middle-Left:** A detailed process flow diagram of a wastewater treatment plant.
- Top Middle-Right:** Photos of aeration tanks and a bar screen, with a table titled "EFFECTS OF SOLIDS CAPTURE ON WATERING COSTS/LW".
- Top Right:** Photos of aeration tanks and a bar screen, with a table titled "TABLE 1 - Typical Operating Parameters of All Plant Process".
- Middle Left:** A graph titled "Biosorption Rate Depends on Temperature" showing a bell-shaped curve.
- Middle Middle-Left:** Photos of aeration tanks and a bar screen, with a table titled "TABLE 1 - Typical Operating Parameters of All Plant Process".
- Middle Middle-Right:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".
- Middle Right:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".
- Bottom Left:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".
- Bottom Middle-Left:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".
- Bottom Middle-Right:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".
- Bottom Right:** Photos of aeration tanks and a bar screen, with a table titled "Common Design Criteria Used in USA".

Wastewater Training Programs

Wastewater Training Materials 4 – CD Set

Higher Life Forms CD
Filamentous Bacteria CD
An Overview of Wastewater Training
Wastewater Microbiology

Filamentous Identification
The Easy Way™ Training CD
Powerful Filamentous Training

Custom Training CD or Manuals

Microbiology Training
“How To Use The Microscope”

Training & Hands On Workshop
Presented by Tracy Finnegan

Wastewater Training Visual Troubleshooting
Tracy Finnegan

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Microbiology Training In Wastewater

Training & Hands On Workshop
Presented by Tracy Finnegan

Microbiology Training

Indicator Organisms

Training & Hands On Workshop
Presented by Tracy Finnegan

Troubleshooting Microbiology

Training & Hands On Workshop
Presented by Tracy Finnegan

Microbiology Training
“Filamentous Identification The Easy Way”

Training & Hands On Workshop
Presented by Tracy Finnegan

An Overview of Wastewater Treatment
CUSTOM TRAINING MANUAL
Author Tracy Finnegan

Wastewater ELearning Training



Online ELearning: Wastewater Training Courses Overview

Control and Minimization of Total costs of operations is always necessary, but guaranteed reliability and long term sustainability are the keys to transport your wastewater treatment system above and beyond normally targeted measures. These wastewater training programs are based upon years of experience and accumulation of practices on actual performance of thousands of treatment systems. These wastewater training programs have been consistently successful in teaching people how to be proactive and achieve their goals of reducing Total Costs of Operation while also achieving compliance.

You will learn step by step procedures which will enable you or your operators to develop quick, easy to establish system checks to control and monitor your system in order to predict upsets, minimize energy and chemical usage, and avoid costly repairs and unnecessary maintenance procedures.

These courses have been pre-approved for Wastewater CEU's in Alaska, Arkansas, California, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Indiana, Louisiana, Maine, Massachusetts, Minnesota, Nevada, New Jersey, Kentucky, New York, North Carolina, Rhode Island, South Dakota, Tennessee, Vermont, Washington, Wisconsin and West Virginia. Some states do not require pre-approval. If you need these approved for your state, please contact our office.

These courses are eligible for CEU's, Contact Hours or PDH (Professional development hour) in Alabama, Arizona, Maryland, Virginia, South Carolina, Utah and more to come.

Now approved in Canada for Nova Scotia and Saskatchewan.

****Some states give different credits than others. Not all states give credits solely based upon contact hours. Please contact our office if you need to know the approval codes and credit hours for your specific state.**

Just Released ***

Secondary Clarifiers, Secondary Biological Wastewater Treatment systems, Nitrification and Denitrification, Spanish Wastewater Basics, Filamentous Identification Introductory Course Coming Soon :Filamentous ID the Easy Way

- Online computer-based training
- Interactive courses with videos, photos, & quizzes
- Convenience and flexibility at individual pace
- No travel expenses or hassles.

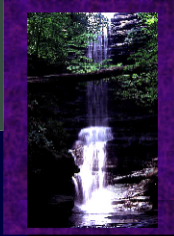
WastewaterElearning.com/elearning

www.EnvironmentalLeverage.com

Environmental Leverage Analytical Services

- Wastewater Biomass Analysis
- Filamentous Identification
- Cooling Tower Microbio Analyses

Always striving to bring the latest technology available to you!



Environmental Leverage Inc.

Wastewater Microbiology Lab Testing

Standard Wastewater

Biomass Analyses :

Cover letter with comments, recommendations and troubleshooting tips.

Higher life form sheet

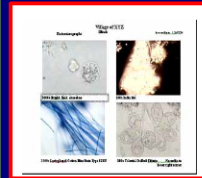
Floc structure analyses

Photo Sheets

A CD with photos and videos included \$250.00

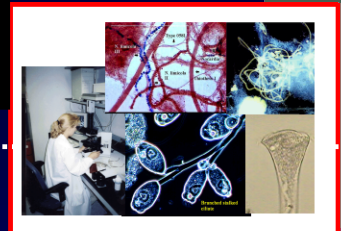
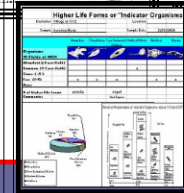
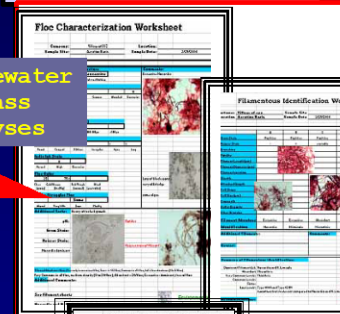
India Ink and LactoPhenol Cotton Blue Stains

Filament Causes and Controls



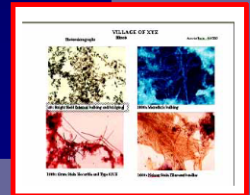
Wastewater Biomass Analyses with **Filamentous Identification** including Gram and Neisser stains, suggestions on causes and control, troubleshooting tips as well as the standard analyses. \$350.00

Wastewater Biomass Analyses



Send 50-100 ml sample in plastic container overnight. No ice cubes, blue ice only. Call to set up sample testing 630-906-9791. Results same day as sample received

Filamentous Identification



Quality • Service

www.EnvironmentalLeverage.com

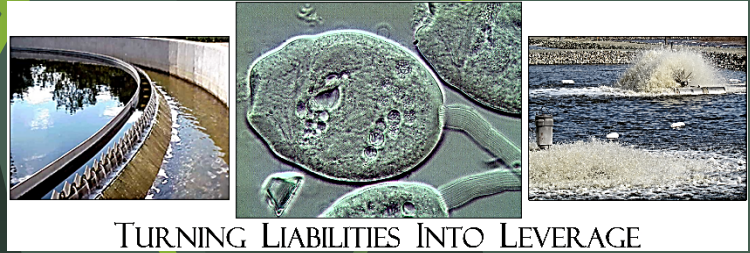
Quality Environmental Products and Services!

With all the concerns today about environmental liability, some of the key issues that manufacturers face include: Globalization, impact of new Science and Engineering technology, Information systems and e-Commerce, Supply chain management, Changes in production processes and manufacturing, Sustainability, Significant impact on Energy savings and Environmental performance. At Environmental Leverage all of these issues are important concerns.

Delivering you innovative and technical expertise and sound business solutions to help you improve your bottom line is our goal.

Capabilities:

- Biological Products: Bioaugmentation products for applications in Papermills, Refineries, Chemical, Tanneries, Masticquaters, Textiles, Steel, Agriculture, Animal Feedlot, Gas Powder plant, Food and Beverage, Dairy Products, Orange Juice factory, Wineries, Cookie factory, vegetable processing plant, Meat packing, Surface Restaurant, Aquaculture, Ornamental Ponds for algae control, C&D, Nursing homes, Military, Campgrounds, Universities, Regulatory agencies



TURNING LIABILITIES INTO LEVERAGE

- ▶ Training & Treatment Systems Audits
- ▶ Newsletters (digital monthly troubleshooting)
- ▶ Troubleshooting
- ▶ Filamentous ID.
- ▶ Higher Life Forms
- ▶ Bug of the Month
- ▶ Microscopic Biomass Analyses

Photo Gallery - Mystery Bug of the Month

Mystery Bug of The Month - From 2004 - 2017

Free swimming ciliates

These photomicrographs were taken from a wastewater sample. Most of the objectives used were 100x, 400x and 1000x. You can see this free swimmer open what looks like a flap to capture food. Notice how when you go from low power to a higher magnification, more details jump out. Do not be afraid to go up to a higher magnification, even 1000x!

What's New!

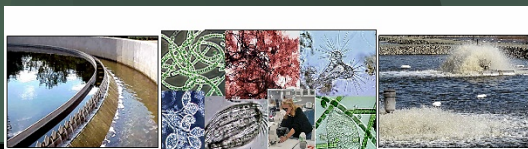
We now have a brand new "Higher Life Forms videos" in our Training CD list. Check out our new Training Materials. We are also in the process of developing an "Online University" in order to meet the needs of our global customers that cannot travel to our public classes. Stay tuned for details and updates.



Join Environmental Leverage® on a Journey
into the Future with our next generation of
Water & Wastewater Treatment solutions

The future begins now. . . .

Environmental Leverage® Inc. bringing you
Tomorrow's Water Today !!!!



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