

Case Study Thoughts



Robert K. Smith DVM

Fatty Liver Syndrome



Fatty Liver Syndrome (Walleye)



Bacterial Disease





Veterinary Feed Directive (VFD) for Aquaculture MINOR SPECIES

22-VFD-19022780

Owner Address:

Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155
Phone: 651-387-2842
PIN/LID: /

Animal Locations:

See attached page for additional sites.

Feed Distributor:

Skretting USA
712 East 2400 North
Tooele, UT 84074
Phone: 435-277-2100
FAX: 435-277-2101

Terramycin®

NADA #038-439, Approved by FDA

Phibro Animal Health
Glenpointe Centre East, 3rd
Floor 300 Frank W. Burr Blvd.,
Suite 21
Teaneck, NJ 07666
Phone: 888-403-0074

Drug Name: Terramycin for Fish (Oxytetracycline)
Dosage and Duration: 3.75 to 7500.0 g/ton for 10 days, - to get to (2.5 to 3.75) g/100 lb of fish/day
Species: Aquaculture
Production Class: Salmonids
Group ID: Pond #1
Approx. Number to be Fed: 60000
Expiration Date: 02-15-2023
Substitutions Not Allowed:

Use of feed containing this Veterinary Feed Directive (VFD) drug in a manner other than as directed on the labeling (extra-label use) is not permitted.

SPECIAL INSTRUCTIONS: This VFD is being issued in accordance with CPG 615.115 for Brook Trout with a withdrawal period of 21 days

COMBINATION FEEDING WITH OTHER DRUGS: This VFD ONLY authorizes the use of the VFD drug(s) cited in this order and is NOT intended to authorize the use of such drug(s) in combination with any other animal drugs.

APPROVED INDICATION: For control of ulcer disease caused by *Hemophilus piscium*, furunculosis caused by *Aeromonas salmonicida*, bacterial hemorrhagic septicemia caused by *Aeromonas hydrophila* and *pseudomonas* disease.

CAUTION: Federal law restricts medicated feed containing this veterinary feed directive (VFD) drug to use by or on the order of a licensed veterinarian. For use in manufacturing medicated fish and lobster feeds only. For use in dry feeds only. Not for use in liquid feed supplements. Reorders (refills) are not permitted with this VFD drug. Certain components of animal feeds, including medicated premixes, possess properties that may be a potential hazard or a source of personal discomfort to certain individuals who are exposed to them. Human exposure should, therefore, be minimized by observing the general industry standards for occupational health and safety. Precautions such as the following should be considered: dust masks or respirators and protective clothing should be worn, dust-arresting equipment and adequate ventilation should be utilized; personal hygiene should be observed; wash before eating or leaving a work site; be alert for signs of allergic reactions—seek prompt medical treatment if such reactions are suspected. Federal law restricts medicated feed containing this veterinary feed directive (VFD) drug to use by or on the order of a licensed veterinarian.

RESIDUE WARNING: Withdraw period of 21 days.

Veterinarian's Signature:

This is a legally binding equivalent of a handwritten signature.

Robert K. Smith DVM
2022-08-15 08:50:35 -05:00

Robert Smith

123 S. Hwy 63
Box 99
Clayton, WI 54004
Phone: 715-948-2971

I certify, as a licensed veterinarian, that the above information is accurate and correct, to the best of my knowledge. I certify that I have a current client relationship with the owner and/or manager of the animals.

This VFD has a minor species specified - see additional pages for more information.

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Antibiotic Use in Aquaculture

- ❖ Approx. $1/3$ of all fish will not eat the treated feed
- ❖ $1/2$ of the $2/3$ of the fish do not eat enough to keep the sustained levels for period of time
- ❖ Resistance develops with antibiotic use
- ❖ Reinfection can occur after use from a contaminated environment

Vaccination

Reduce Stress





Approved Drugs for Use in Aquaculture



| FLORFENICOL | | | | |
|---|-----------------------------|---|---|--|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| AQUAFLO [®] Intervet/Schering-Plough Animal Health Corp. 1-800-521-5767 | Catfish | Control of mortality due to enteric septicemia associated with <i>Edwardsiella ictaluri</i> | • 10 mg florfenicol per kg fish per day for 10 days | • Veterinary Feed Directive (VFD) drug • 12-day withdrawal time |
| | | Control of mortality due to columnaris disease associated with <i>Flavobacterium columnare</i> (Conditional Approval) | • Must use AQUAFLO [®] -CA1 product | • VFD drug • 12-day withdrawal time |
| AQUAFLO [®] | Freshwater-reared salmonids | Control of mortality due to furunculosis associated with <i>Aeromonas salmonicida</i> | • 10 mg florfenicol per kg fish per day for 10 days | • VFD drug • 15-day withdrawal time |
| | | Control of mortality due to coldwater disease associated with <i>F. psychrophilum</i> | • 10 mg florfenicol per kg fish per day for 10 days | • VFD drug • 15-day withdrawal time |

| HYDROGEN PEROXIDE | | | | |
|--|---|---|--|---|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| 35% PEROX-AID [®] Western Chemical, Inc. 1-800-283-5292 | Freshwater-reared finfish eggs | Control of mortality due to saprolegniasis | • Coldwater and coolwater: 500 - 1,000 mg per L for 15 min in a continuous flow system once per day on consecutive or alternate days until hatch • Warmwater: 750 - 1,000 mg per L for 15 min in a continuous flow system once per day on consecutive or alternate days until hatch | • Initial bioassay on a small number of fish is recommended before treating the entire group • 0-day withdrawal time |
| | | Control of mortality due to bacterial gill disease associated with <i>Flavobacterium branchiophilum</i> | • 100 mg per L for 30 min or 50 - 100 mg per L for 60 min once per day on alternate days for 3 treatments | • Initial bioassay on a small number of fish is recommended before treating the entire group • 0-day withdrawal time |
| 35% PEROX-AID [®] | Freshwater-reared coolwater finfish and channel catfish | Control of mortality due to external columnaris disease associated with <i>F. columnare</i> | • Fingerlings and adults: 50 - 75 mg per L for 50 min once per day on alternate days for 3 treatments • Fry: 50 mg per L for 60 min once per day on alternate days for 3 treatments | • Initial bioassay on a small number of fish is recommended before treating the entire group • Should not be used to treat northern pike or paddlefish (any life-stage) or pallid sturgeon (fy) • Use with caution on wALLEY • 0-day withdrawal time |

| CHORIONIC GONADOTROPIN | | | | |
|--|-------------------------------|------------------------------------|--|--|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| CHORULON [®] Intervet Inc. 1-800-441-8272 | Male and female brood finfish | Aid in improving spawning function | • 50 - 510 IU per lb males • 67 - 1,816 IU per lb females | • Intramuscular injection • Up to three doses. Total dosage not to exceed 25,000 IU in fish intended for human consumption • Prescription product restricted to use by or on the order of a licensed veterinarian • 0-day withdrawal time |

| FORMALIN | | | | |
|---|---|---|---|--|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| PARASITE-S Western Chemical, Inc. 1-800-283-5292 | All finfish | Control of external protozoa (species of the genera <i>Chilodonella</i> , <i>Costia</i> , <i>Epiplatys</i> , <i>Ichthyophthirius</i> , <i>Scyphidia</i> , and <i>Trichodina</i>) | • Salmon & trout in tanks and raceways: • Above 50°F: up to 170 µL per L for up to 1 hr • Below 50°F: up to 250 µL per L for up to 1 hr | • Drug must not be subjected to temperatures below 40°F • Do not apply to ponds when (1) water is warmer than 80°F, (2) there is a heavy phytoplankton bloom, or (3) dissolved oxygen is less than 5 mg per L • Ponds may be retreated in 5 to 10 days if needed • Do not treat ponds containing striped bass • Test on a small number of fish from each lot to check for any unusual sensitivity to formalin before proceeding • 0-day withdrawal time |
| | | monogenetic trematodes (species of the genera <i>Cleidodiscus</i> , <i>Dactylogyrus</i> , and <i>Gyrodactylus</i>) | • All other finfish up to 250 µL per L for up to 1 hr • Earthen ponds: 15 - 25 µL per L indefinitely | • Preliminary bioassay should be conducted on a small number of fish to determine species sensitivity • 0-day withdrawal time |
| FORMALIN-F Natchez Animal Supply Co. 1-800-647-6760 | All finfish eggs | Control fungi of the family Saprolegniaceae | • All finfish eggs: 1,000 - 2,000 µL per L for 15 min • Species of the order Acipenseriformes: up to 1,500 µL per L for 15 min | • Preliminary bioassay should be conducted on a small number of fish to determine species sensitivity • 0-day withdrawal time |
| FORMACIDE-B B.L. Mitchell, Inc. 1-800-817-5808 | Penaeid shrimp | Control protozoan parasites (species of the genera <i>Bodo</i> , <i>Epiplatys</i> , and <i>Zootheridion</i>) | • Tanks and raceways: 50 - 100 µL per L for up to 4 hrs daily • Earthen ponds: 25 µL per L as single treatment | • Drug must not be subjected to temperatures below 40°F • Do not apply to ponds when (1) water is warmer than 80°F, (2) there is a heavy phytoplankton bloom, or (3) dissolved oxygen is less than 5 mg per L • Ponds may be retreated in 5 to 10 days if needed • 0-day withdrawal time |
| PARACIDE-F Argent Laboratories 1-800-426-6258 | Salmon, trout, catfish, largemouth bass, and bluegill | Control external protozoa (species of the genera <i>Chilodonella</i> , <i>Costia</i> , <i>Epiplatys</i> , <i>Ichthyophthirius</i> , <i>Scyphidia</i> , and <i>Trichodina</i>) | • Salmon & trout in tanks and raceways: • Above 50°F: up to 170 µL per L for up to 1 hr • Below 50°F: up to 250 µL per L for up to 1 hr | • Drug must not be subjected to temperatures below 40°F • Do not apply to ponds when (1) water is warmer than 80°F, (2) there is a heavy phytoplankton bloom, or (3) dissolved oxygen is less than 5 mg per L • Ponds may be retreated in 5 to 10 days if needed • Do not treat ponds containing striped bass • Test on a small number of fish from each lot to check for any unusual sensitivity to formalin before proceeding • 0-day withdrawal time |
| | | monogenetic trematodes (species of the genera <i>Cleidodiscus</i> , <i>Dactylogyrus</i> , and <i>Gyrodactylus</i>) | • Catfish, largemouth bass, and bluegill: up to 250 µL per L for up to 1 hr • Earthen ponds: 15 - 25 µL per L indefinitely | • Preliminary bioassay should be conducted on a small number of fish to determine species sensitivity • 0-day withdrawal time |
| PARACIDE-F | Salmon, trout, and esocid eggs | Control fungi of the family Saprolegniaceae | • 1,000 - 2,000 µL per L for 15 min | • Preliminary bioassay should be conducted on a small number of fish to determine species sensitivity • 0-day withdrawal time |

| SULFADIMETHOXINE & ORMETOPRIM | | | | |
|---|-----------|---|--|---------------------------------------|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| ROMET [®] 30 and ROMET [®] TC Aquatic Health Resources 1-877-280-2858 | Salmonids | Control of furunculosis due to <i>Aeromonas salmonicida</i> | • 50 mg per kg fish per day for 5 days | • In feed • 42-day withdrawal time |
| ROMET [®] 30 and ROMET [®] TC | Catfish | Control of enteric septicemia due to <i>Edwardsiella ictaluri</i> | • 50 mg per kg fish per day for 5 days | • In feed • 3-day withdrawal time |

NOTE

• **Disclaimer:** Always refer to each product's label for specific instructions. It is the user's responsibility to read the MSDS for each product and comply with local NPDES requirements. Use of product names does not indicate endorsement by the U.S. Fish & Wildlife Service, the U.S. Food & Drug Administration, or the American Fisheries Society.

• **Veterinary Feed Directive (VFD) drug (e.g., Aquaflor[®]):** Certain drugs that are intended for use in animal feeds. The use of VFD drugs is permitted only under the professional supervision of a licensed veterinarian. VFD drugs cannot be used under extra-label drug-use provisions.

• **Prescription drugs (e.g., Chorulon[®]):** Drugs that may be used only by, or on the order of, a licensed veterinarian.

• **Extra-Label Use:** The actual or intended use of an FDA-approved drug in a manner that is not in accordance with the approved label directions. Extra-label use is permitted only by, or on the order of, a licensed veterinarian when a valid veterinarian-client-patient relationship exists.

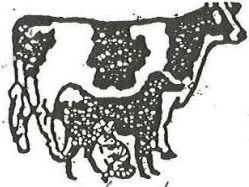
• **FDA Information:** Please see the FDA/CVM website for additional information and new approvals (www.fda.gov/cvm). Contact FDA/CVM regarding any adverse drug events, including lack of effectiveness, with any approved drug (1-888-FDA-VETS).

| OXYTETRACYCLINE HYDROCHLORIDE | | | | |
|---|-----------------------------|-----------------------|--|------------------------|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| Oxytetracycline HCl Soluble Powder-343 IVX Animal Health 1-800-758-3654 | Finfish fry and fingerlings | Mark skeletal tissues | • 200 - 700 mg oxytetracycline hydrochloride (buffered) per L of water for 2 - 6 hrs | • None |
| TERRAMYCIN-343 Aquatic Health Resources 1-877-280-2858 | | | | |
| TETROXY [®] Aquatic Soluble Powder Bimed 1-888-524-6332 | | | | |

| OXYTETRACYCLINE DIHYDRATE | | | | |
|--|---|--|---|--|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| TERRAMYCIN [®] 200 for Fish Phibro Animal Health 1-888-475-7355 | Pacific salmon | Mark skeletal tissue | • 250 mg per kg fish per day for 4 days | • Salmon <30 g size • In feed as sole ration for 7-day withdrawal time |
| | Salmonids | Control of ulcer disease (<i>Hemophilia piscium</i>), furunculosis (<i>Aeromonas salmonicida</i>), bacterial hemorrhagic septicemia (<i>A. liquefaciens</i>), and pseudomonas disease (<i>Pseudomonas</i> spp.) | • 2.5 - 3.75 g per 100 lbs fish per day for 10 days | • In mixed ration • 21-day withdrawal time • No temperature restrictions on use |
| TERRAMYCIN [®] 200 for Fish Phibro Animal Health 1-888-475-7355 | Freshwater-reared salmonids | Control of mortality due to coldwater disease caused by <i>Flavobacterium psychrophilum</i> | • 3.75 g per 100 lbs fish per day for 10 days | • In mixed ration • 21-day withdrawal time • No temperature restrictions on use |
| | All freshwater-reared Oncorhynchus mykiss | Control of mortality due to columnaris disease (<i>F. columnare</i>) | • 3.75 g per 100 lbs fish per day for 10 days | • In mixed ration • 21-day withdrawal time • No temperature restrictions on use |
| TERRAMYCIN [®] 200 for Fish Phibro Animal Health 1-888-475-7355 | Catfish | Control of bacterial hemorrhagic septicemia (<i>A. liquefaciens</i>) and pseudomonas disease (<i>Pseudomonas</i> spp.) | • 2.5 - 3.75 g per 100 lbs fish per day for 10 days | • In mixed ration • Water temperature not below 62°F (16.7°C) • 21-day withdrawal time |
| | | Control of gaffkemia (<i>Aerococcus viridians</i>) | • 1 g per lb medicated feed for 5 days | • In feed as sole ration • 30-day withdrawal time |

| TRICHAINE METHANESULFONATE | | | | |
|---|---|--------------------------|--|---|
| Product name & supplier | Species | Indication | Dosing | Limitations & comments |
| FINQUEL Argent Laboratories 1-800-426-6258 | Fish (of the families Ictaluriidae, Salmonidae, Esocidae and Percidae), aquatic amphibians, and other aquatic poikilotherms | Temporary immobilization | • Fish: 15 - 330 mg per L • Other poikilotherms: 1:1,000 - 1:20,000 | • Powder is added to water • Concentration depends upon desired degree of anesthesia, species, size, water temperature and salinity, and stage of development • Preliminary tests of solution should be made with a few fish • 21-day withdrawal time (fish) • Laboratory or hatchery use only in other poikilotherms - water temperature over 50°F |
| TRICHAINE-S Western Chemical, Inc. 1-800-283-5292 | | | | |





CLAYTON
VETERINARY
CARE

FISH NECROPSIES

CLAYTON VETERINARY CARE
123 U.S. Hwy 63, Box 99
Clayton, WI 54004
Phone #715-948-2971

Date 4/17/7 Species CSM Case History _____ Lot # 061707109
Location _____ Fish Owner _____ Origin of Fish _____ Age _____
Reason for Necropsy VHA Hatch Date _____ Fish Source _____ Rating AVERAGE

| Smp no. | Lgth mm | Wght gm | Fin cndtn | Skin cndtn | Eye | Gill | Psbr | Msc | Fat | Spl | Hind gut | Kid | Liv | Bile | Sex | Remarks |
|---------|---------|---------|----------------|----------------|-----|----------------|------|----------------|-----|-----|----------|-----|-----|------|-----|---------|
| 1 | 107 | 10.0 | 5 _n | 5 _n | N | 4 | N | N | 1 | N | E | N | N | + | F | |
| 2 | 114 | 13.2 | 5 _n | 4 _n | N | 4 _d | N | N | 1 | N | E | N | N | + | UD | |
| 3 | 109 | 9.7 | 5 _n | 4 _n | N | 4 _d | N | N | 1 | N | E | N | N | + | F | |
| 4 | 104 | 10.1 | 5 | 5 | N | 4 _d | N | N | 2 | N | E | N | N | + | UD | |
| 5 | 102 | 8.4 | 5 _n | 3 _n | N | 5 | N | N | 1 | N | E | N | N | + | M | |
| 6 | 111 | 11.2 | 5 _n | 5 _n | N | 4 | N | N | 1 | N | E | N | N | + | F | |
| 7 | 113 | 9.9 | 4 _n | 5 _n | N | 5 | N | N | 2 | N | E | N | N | - | M | |
| 8 | 107 | 12.1 | 4 _n | 4 | N | 5 | N | N | 2 | N | E | N | N | + | UD | |
| 9 | 94 | 7.1 | 5 _n | 4 _n | N | 5 | N | N _n | 2 | N | E | N | N | - | UD | |
| 10 | 112 | 11.2 | 5 | 5 _n | N | 4 | N | N _n | 1 | N | E | N | N | + | F | |
| 11 | 106 | 13.4 | 2 | 5 | N | 5 | N | N | 2 | N | E | N | N | + | M | |
| 12 | 112 | 8.4 | 4 _n | 5 _n | N | 4 | N | N | 1 | N | E | N | N | + | UD | |
| 13 | 106 | 10.7 | 4 _n | 4 _n | N | 4 | N | N _n | 2 | N | E | N | N | + | UD | |
| 14 | 95 | 8.4 | 2 _n | 4 _n | N | 4 | N | N | 1 | N | E | N | N | + | M | |
| 15 | 108 | 9.9 | 5 _n | 5 _n | N | 3 | N | N | 1 | N | E | N | N | + | UD | |
| 16 | 107 | 9.9 | 3 _n | 4 _n | N | 5 | N | N _n | 1 | N | F | N | N | + | UD | |
| 17 | 116 | 12.8 | 5 | 5 _n | N | 4 | N | N | 2 | N | E | N | N | + | UD | |
| 18 | 120 | 13.1 | 5 _n | 4 _n | N | 4 | N | N | 1 | N | E | N | N | + | UD | |
| 19 | 112 | 11.2 | 5 _n | 5 _n | N | 4 _n | N | N | 2 | N | E | N | N | + | M | |
| 20 | 110 | 9.3 | 5 | 5 _n | N | 4 _n | N | N | 1 | N | E | N | N | + | UD | |

Ave ²¹⁹⁷ 108.85 ²¹⁰ 10.5 ⁸³ 4.15 ⁴⁰ 4.5 ⁸⁵ 4.25 ⁸⁸ 1.4 = 3.575 K.E.I. 0965

n-neascus d-dactylogyrus g-gyrodactylus a-amoebileptus



Minor Water Parameters

- - Alkalinity
- - Carbon Dioxide
- - Chloride
- - Hardness

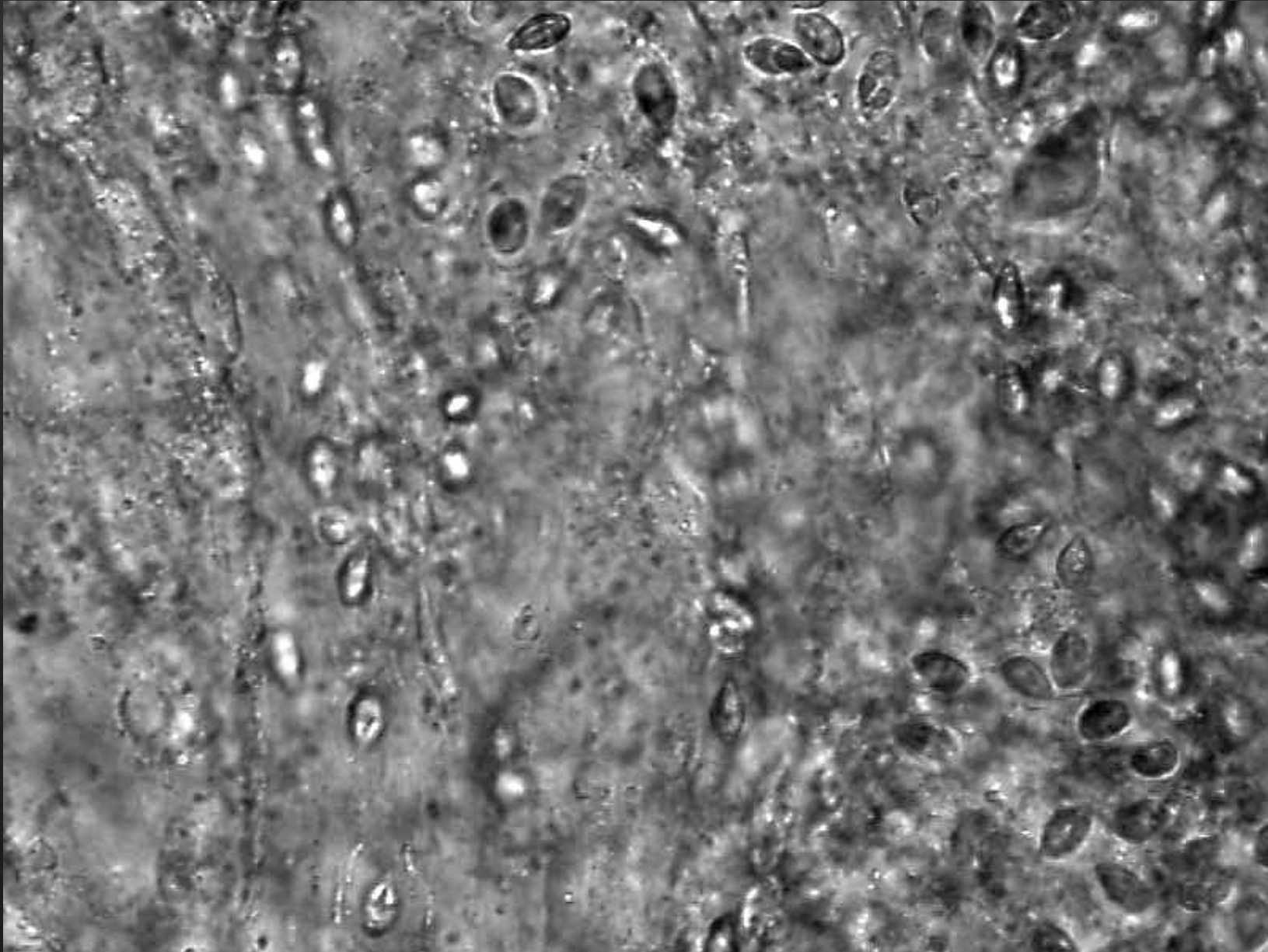
Refer to established water-quality lab

- Biological Oxygen Demand, Suspended Solids, Total Nitrogen, Total Phosphorus

Biosecurity



Myxobolus sp.



Questions?

