YELLOW BAY REGISTRATION FORM

PREREGISTRATION is required due to facility limitations. If you plan to attend the **Advanced Wastewater Training Course** in Yellow Bay on August 27-29, 2019, you must **preregister and payment must be made by August 13th.** Please send this form and payment to:

METC
MSU-Northern
P.O. Box 7751
Havre, MT 59501

For more information call METC at 265-3763.

Name: _____

Address: _____

City: _____State: _____ Zip:_____

Phone: _____ Employer: _____

E-mail Address: _____

Please indicate which package you are registering for:

Package A: [ ] $500.00
Includes registration, workshop materials, and lunch on Tuesday 8/27 only. Accommodations made on your own. Polson 14 miles south and Bigfork 18 miles north.

Package B: [ ] $650.00
Includes registration, workshop materials, lodging for Monday 8/26, (check-in by 7pm), Tuesday 8/27 and Wednesday 8/28. Meals included are lunch & dinner only for Tuesday 8/27.

Lodging for Package B:
Cabin
Circle First Choice - **Single Occupancy** OR **Double Occupancy**
Large common shower/restroom facility- linens provided.
Cabin assignments will be made at check-in on Monday, August 26th.

Amount Paid $_____

[ ] Check # _____ [ ] PO# _____

Credit Card: [ ] Master Card [ ] Visa

Card Number: _____

Security Code: _____

Expiration Date: _____

Card Holder Signature: _____

NONPROFIT
U.S. POSTAGE
PAID
Great Falls, MT
Permit No. 167

Montana Environmental Training Center
MSU-Northern
P.O. Box 7751
Havre, MT 59501

Montana Environmental Training Center

29th Annual

Advanced Wastewater Course

Improving Performance of Biological Wastewater Treatment Systems

YELLOW BAY

Flathead Lake Biological Station

Highway 35 between Polson and Big Fork

East side of Flathead Lake

Lakeside Building

August 27th – 29th, 2019

29th Annual Advanced Wastewater Training

August 27–29, 2019

ABOUT THIS COURSE

This course is designed for operators and managers interested in a better understanding of the microbiological basis for WWTP performance. This course discusses strategies to reduce TSS, BOD and nutrients while avoiding significant capital costs. The course is designed for operators of secondary treatment plants utilizing activated sludge and BNR technologies. If you are considering a plant expansion, need to improve performance or reduce your O&M cost, consider this year's Yellow Bay workshop. **Plus evenings of fun - canoeing, hiking, ping-pong, who knows.**

CEUs = 2.00 **20 contract hours**

WHO SHOULD ATTEND

Operators, lab technicians and plant supervisors with an interest in improving the performance of their activated sludge systems will find this workshop beneficial. Individuals who design wastewater systems, provide regulatory oversight, or are responsible for process control will appreciate the use of case histories to illustrate the practical application of science and engineering that achieves optimal plant performance.

SPEAKER

PAUL KLOPPING, **Principal, Callan & Brooks, Inc.**

Mr. Klopping has over 40 years experience in biological treatment, training and technical assistance. He completed his undergraduate and graduate training at California State University, Long Beach. He is a certified WWTP operator and a certified environmental trainer, having delivered over 1,000 training programs across North America. **So bring your questions, a jug of mixed liquor, a settlometer and a good story to share.**

Improving Performance of Biological Wastewater Treatment Systems

Yellow Bay ~ 2019

>>AGENDA<<

TUESDAY, AUGUST 27, 2019

7:30am Registration (Lakeside Building Classroom)

8:00 am - 12:00 pm

Biological Basis for Plant Performance

- Introduction & Course Objectives.
- Wastewater Microbiology & Biochemistry: Why Secondary Treatment & Advanced BNR Works the Way It Does.
- Floc Structure, microbial composition and settling characteristics.
- Introduction to Bulking & Foaming Problems.

How the Microbiology Affects WWTP Capacity and Performance

- Flocculation & Solids Separation Problems.
- Biopolymers & Charge Density. **NEW!!**
- Understanding & Controlling SVI.
- Making the Most of Your Operational Tactics - D.O., pH/Alkalinity, RAS, WAS, MCRT, SRT, & F/M. **NEW!!**
- Measuring Active Biomass via OUR and ATP.
- Advanced Microbiological Techniques including DNA sequencing. **NEW!!**

12:00 - 1:00 pm LUNCH PROVIDED

1:00 - 3:00 pm

Principles of Biological Nutrient Removal

- Forms of Nitrogen/Nitrogen Cycle.
- Nitrification & Denitrification.
- Selectors - Aerobic, Anoxic & Anaerobic.
- Review of BNR Designs & Modes of Operation.
- Denitrification Simulation.

3:00 - 5:00 pm

Hands-on Demo Lab Exercises

- **(**Bring your WWTP design criteria, process flow diagram and operating data, & at least 2 liters of MLSS. *Extra Credit* for bringing a Settlometer.)
- Care and Feeding of the Microscope.
- Assessment of MLSS Samples with a Phase Contrast Microscope-Guided Discussion on Big Screen.
- Video Review of MLSS Samples, Correlation Between Settling Characteristics and Microscopic Characteristics….Award for Most Filaments, Best Floc, Weirdest Microbe.
- SVI Measurements & Oxygen Uptake Rate.

WEDNESDAY, AUGUST 28, 2019

8:00—10:00 am

Phosphorus Transformations & Removal - NEW!!

- Enhanced Biological Phosphorus Removal - Biological Principles.
- PAOs & GAOs
- Role of VFAs, Effect of Temperature, pH & Carbon Source.
- Sidestream Management.
- Simultaneous Nitrification, Denitrification & Phosphorus Removal.
- Troubleshooting EBPR Problems.

10:30 am - 12:30 pm

- Big Fork WWTP Tour

12:30 - 1:30 pm

- **LUNCH ON YOUR OWN** and Travel to Kalispell Advanced WWTP

1:30 - 5:00 pm

- Kalispell WWTP Tour & Discussion of Control Strategies

THURSDAY, AUGUST 29, 2019

8:00 am - 12:00 pm

Troubleshooting Performance Problems

- Diagnosing & Correcting Flocculation, Hydraulics, Sludge Inventory & Sludge Removal Problems.
- Using the Clarifier State Point Model to Predict Performance.
- Nitrification/Denitrification - Understanding & Controlling It.
- Managing the Clarifier During Extreme Conditions (Rainfall, High & Low Loading).
- Clarifier Modifications, Using Selectors to Improve Settleability & Reduce Energy.
- D.O. Control, ORP, Energy Conservation.
- BOD, TSS, & Nutrient Removal Problems & Case Histories.

Wastewater Jeopardy

Is That Your Final Answer?...Working in teams to apply the concepts covered in the course?

To Get the Most Benefit Out of the Course Please Bring:

- Your WWTP Design Criteria.
- Process Flow Diagram.
- Operating Data.
- Calculator.
- A Settlometer.
- At Least 2 Liters of MLSS.