Announcing a Powerful - "Hands ON" Diagnostic Troubleshooting and Optimization Workshop for Lagoon Operators and Wastewater Professionals

Discover new tools you can apply immediately to optimize your lagoon's performance and keep your system in compliance

HOW TO TROUBLESHOOT WASTEWATER LAGOON SYSTEMS

APRIL 1 – 2, 2020

Hands-on Lagoon Training at the Greenfield, CA Wastewater Lagoon System where operators will participate in ammonia, nitrate, nitrite, alkalinity, sludge, and DO and pH profiling

The presenter in the field and at this workshop will be author & one of the Wastewater Industries' **TOP CONSULTANTS, Steve Harris**.

In this 2-day workshop, you will discover diagnostic tools to help you identify where, when, and why problems are occurring in your lagoon system. We will discuss new methods, techniques, and strategies you can use to get more BOD reduction, better TSS removal, Ammonia reduction, odor control, free sludge reduction, nutrient removal, and how to add more years of dependable service to the lagoon system you already have. In this workshop you'll discover:

- Diagnostic keys to pinpointing where, when and why problems are occurring
- How to remove the greatest deterrent to your pond's treatment performance
- The 11 possible causes of high BOD and their 50 possible solutions
- The 7 possible causes of TSS problems and their 44 possible solutions
- How to troubleshoot ammonia removal problems
- How to get 12 inches of sludge reduction without dredging...and so much more!

Increase your value as an operator by building effective diagnostic and lagoon problem-solving skills

Agenda for Advanced 2-Day Hands-on Lagoon Optimization Workshop

Greenfield, California April 1-2, 2020	
8:00 AM to 8:30 AM	**Registration** at the Greenfield Community Center, 1351 Oak Ave, Greenfield
8:30 AM to 10:00 AM	**Chief Failings of Lagoon Systems,** Six (6) main reasons why lagoons fail. The importance of biomass, hydraulics, sludge, testing, and maintenance on lagoon performance.
10:00 AM to 10:15 AM	Break
10:15 AM to 11:30 AM	**Lagoon System Upgrades and Lagoons that Produce Great Effluent**
11:30 AM to 12:30 PM	Lunch
12:30 PM to 3:30 PM (Meet at the Greenfield Pond System, Northeast end of Walnut Ave.)	**Greenfield Lagoon Field Testing**, the basics of how to test and sample a municipal wastewater lagoon system for optimization. Dissolved Oxygen, Ammonia, Nitrate, & Temperature, Alkalinity Using a DR 1900 and Test Strips. How to pull samples, where to pull samples, and when to pull samples. How to properly sludge judge a lagoon.
3:30 PM to 4:30 PM	**Diagnosing Wastewater Lagoon Problems**. How to determine the source of lagoon problems. The eleven things an operator must know to troubleshoot or optimize a lagoon. The essential role of monitoring and record keeping in solving problems in a lagoon system. How pond chemistry changes over the day & year. Sampling locations and a discussion of the value of different tests. How to interpret test results.
DAY TWO (Greenfield Community Center)	
8:30 AM to 10:30 AM	**Diagnosis Field Study** Mission Hills Total Nitrogen Optimization Protocol **Analyzing the Greenfield Field Data** Analyzing Dissolved Oxygen, Ammonia, Nitrate, Alkalinity, pH, and Temperature data.
10:30 AM to 10:15 AM	Break
10:15 AM to 12:00 PM	**Diagnosing and Troubleshooting BOD_5 Problems**. How to tell if your lagoon can handle additional load from a new subdivision, jail, hotel, handle septage, or industrial waste. Understanding $CBOD_5$ vs. BOD_5. Diagnostic BOD_5 Case studies from the field on solving BOD_5 issues.
12:00 PM to 12:30 PM	Lunch
12:30 PM to 2:00 PM	**Troubleshooting TSS Problems**. What is BOD & TSS? Algae related TSS problems and algae's effect on BOD. Where and how to sample. The six steps to take to isolate the cause of a BOD_5 problem. Typical loading rates. The benefits of algae. Algae's problematic side and in-pond strategies to remove algae. Methods for controlling algae growth. Lagoon colors and their meaning.
2:00 PM to 2:15 PM	Break

2:15 PM to 3:30 PM	**Sludge Accumulation and Removal**. The problems accumulated sludge creates. Ten signs indicating it is time to remove sludge. Fifteen things that affect the rate of sludge accumulation. Typical sludge removal rates. How to determine the volume of sludge, sludge judging and core sampling. Things to consider before sludge judging a lagoon and how to prepare for this test. Formula for determining sludge volume and mass. How to Desludge a pond. Getting free sludge removal. **Troubleshooting Ammonia and Phosphorous Problems**. Nitrogen removal pathways and the eleven key factors that determine the rate of nitrogen removal. The chemistry and biology of nitrogen removal in lagoon systems. How to optimize a lagoon system for nitrogen removal. Case studies from cities that have controlled their ammonia & phos problems.
3:30 PM to 4:30 PM	**Pond Hydraulics for Enhanced System Performance.** How a small amount of short-circuiting dramatically affects pond system performance. Solutions to poor hydraulic design.

Wastewater Lagoon Troubleshooting and Optimization

OBJECTIVES

This workshop has the following objectives:

1) Give class members an understanding of the basic biology and chemistry of lagoon systems and to leverage that understanding to solve problems in lagoons. Assist class members in understanding that each microbe has a unique function to perform, and why water quality changes spatially throughout a lagoon system because of it.
2) Familiarize students with proper testing procedures. Discuss where to test in a lagoon system, how to properly test, and why. Covered is the meaning of each test and its value to operators when trying to understand test results. Understand the role of testing and how to use test results to diagnose lagoon problems.
3) Improve operator's skill in testing to solve BOD_5 problems, TSS problems, fecal problems and other problems common to wastewater lagoon systems.
4) Provide knowledge and skill in determining if more load can be added to a lagoon. Specific causes of BOD_5 problems and their solutions are discussed.
5) Provide in depth knowledge of the causes of TSS problems and solutions to high TSS. In-pond management strategies to control algae are discussed. Chemical and engineered solutions to TSS problems are discussed. Discussion of lagoon colors and their meaning.
6) Discuss the consequences of short-circuiting in pond systems. Explain how pond temperature affects pond mixing. Teach operators what to do about short-circuiting problems.
7) Case study and lecture on the problems associated with sludge accumulation. Class members are taught how to determine sludge volume and mass, and how to sludge judge lagoons. Calculations are given to help the student determine sludge mass and volume. Sludge removal options are presented.
8) Understanding of the role of oxygen in a lagoon system is discussed. Strategies for odor control are presented. Case studies on changes in lagoon dissolved oxygen are discussed. Causes and solutions to low dissolved oxygen are reviewed.

9) How to troubleshoot and optimize a lagoon system for nutrient removal, and pathogen removal. Lagoon maintenance and cold weather operations strategies are presented.

(Please also see workshop agenda for more specifics)

COURSE DESCRIPTION

Discussed in the class are new methods, techniques, and strategies operators can use to get more BOD reduction, better TSS removal, odor control, sludge reduction, nutrient removal, and more years of dependable service out of the lagoon systems operators already have. In this class operators discover:

- How to remove the greatest deterrent to your pond's treatment performance
- The keys to getting greater control over your lagoon system to remove more BOD, TSS, and sludge
- The 11 possible causes of high BOD and their 50 possible solutions
- The 7 possible causes of TSS problems and their 44 possible solutions
- How to troubleshoot nitrogen removal problems
- How to get 12 inches of sludge reduction without dredging…*and much more*

This wastewater lagoon troubleshooting workshop pulls together years of research and time-tested operational strategies proven to enhance a lagoon's performance. In this class hundreds of practical and effective "how to" solutions are presented to make lagoon operators more effective at their job. This workshop delivers quick, clear, step by step approaches to solving lagoon problems. Operators in this workshop learn what it takes to get the most out of their existing lagoon system without spending lots of money. Attendees will develop the skills and learn the practical techniques for realizing their lagoon's full potential.

INSTRUCTOR

The instructor for the Lagoon Troubleshooting and Optimization Workshop will be:
Mr. Steven M. Harris, President of H&S Environmental, LLC.
hssenvironmental@earthlink.net
Phone: 480/274-8410

Suggested study material for the course:

Wastewater Lagoon Troubleshooting, an Operators Guide to Solving Problems and Optimizing Lagoon Systems © 2003 by H&S Environmental, LLC

This manual is available on-line at www.lagoonops.com, or through USA BlueBook.
Class members are encouraged to participate during case study discussion and at any time during the class. Questions from operators about their own systems are highly encouraged. This allows members of the class to learn from experiences other operators have had in solving similar problems. Case studies developed from lagoon systems solving various problems allow the operator to use the diagnostic tools learned in earlier sessions to solve actual problems.

Educational Points:

In California, operators may be required to obtain education points to qualify for certification (an increase in their Grade level). This course provides 1.4 education points. When you complete the 14-hour class you will receive a certificate that verifies completion.

Operators up Grading: Receive 1.4 Education Points towards your wastewater operator certification exam!

****** SIGN UP TODAY! SPACE IS LIMITED ******

REGISTRATION FOR THE CLASS

Registration Information
Because this is a hands-on laboratory and field class, seating is limited.
Registration is on a first come first serve basis. Sign up now BY SENDING THIS FORM IN to insure you will get a seat.
Payments accepted via check or credit card (below) or via Paypal at http://lagoonops.com/products/
Cancellations received up to 7 calendar days before the seminar are refundable, minus a $25 registration service charge.
After that, seminar fees are not refundable but can be credited to future workshops.

Address:
Lecture Portion: *First half of Day 1 and Day 2*
Greenfield Community Center 1351 Oak Avenue, Greenfield, CA 93927 Phone: (831) 674-2635
Fieldwork Portion: *Second half of Day 1*
Greenfield Wastewater Treatment Plant, pond system East End of Walnut Avenue, Greenfield, CA 93927

Wastewater Lagoon Optimization & Troubleshooting, comprehensive 2-day hands-on workshop

2 days, just . . . . . .**$199 per person**

Name(s): _____

_____

Municipality/Business: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax:_____

email:_____

Number of Attendees_____

Payment Amount: $_____ **Check (√)** _____(Make Check Payable to H&S Environmental, LLC)

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H&S Environmental, LLC
2122 E. Leland circle
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1 (480) 274-8410
lagoonops@gmail.com
www.lagoonops.com


Greenfield Wastewater
Treatment Plant
Day 1 afternoon
East End of Walnut Ave.
Greenfield Community Center
Day 1 morning and Day 2
1351 Oak Ave.
101
El Camino Real
Walnut Ave
Cypress Ave
2nd St
3rd St
Elm Ave
Greenfield
Oak Ave
14th St
Greenfield High School