

## Announcing a Powerful - "Must See" 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

MAY 12th-13th 2010

The Latest Discoveries and Proven Techniques to Optimize and Solve Problems in Wastewater Lagoon Systems

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



In this 2-day workshop you will discover new methods, techniques, and strategies you 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 system you already have. In this workshop you'll 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 so much more!

Increase your value as an operator by building effective diagnostic and problem solving skills - 12 CEUs available

Presented by:  
H&S Environmental, LLC



Sponsored by:  
The Pueblo of  
Santa Ana



Supported by:  
New Mexico Rural  
Water Association



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# LAGOON TROUBLESHOOTING WORKSHOP AGENDA

## DAY ONE

8:00 am to 8:30 am Registration

8:30 am to 10:00 am **SECTION 1 - Wastewater Lagoon Microbiology**, the basics of how lagoons work to stabilize waste. Lagoon Food Webs, nutrient cycling, and how water quality changes with changing depth. Variables affecting pond performance. The role of various microbes in a lagoon system. **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.

10:00 am to 10:15 am Break

10:30 am to 12:00 pm **SECTION 2 - Diagnosing and Troubleshooting BOD<sub>5</sub> Problems.** Where and how to sample. The six steps to take to isolate the cause of a BOD<sub>5</sub> problem. Typical loading rates. How to tell if your lagoon can handle additional load from a new subdivision, jail, hotel, handle septage, or industrial waste. Understanding CBOD<sub>5</sub> vs. BOD<sub>5</sub>. Diagnostic BOD<sub>5</sub> Case studies from the field on solving BOD<sub>5</sub> issues.

12:00 pm to 1:00 pm Lunch

1:00 pm to 2:00 pm **SECTION 3 - Troubleshooting TSS Problems.** What is TSS? Algae related TSS problems. 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. Ingenious non-chemical methods for the removal of Duck weed. Case studies on algae suppression and growth from various cities.

2:00 pm to 2:15 pm Break

2:15 pm to 3:30 pm **SECTION 4 - 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. The costs of sludge removal and how to protect yourself. **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 **SECTION 5 - Pond Hydraulics** - How to calculate theoretical retention time and six things that cause shortcircuiting in a lagoon system. How to tell if a pond has a short circuiting problem. Thermocline's role in short-circuiting and how to deal with water density problems. Confirming short-circuiting problems and how to solve them. Case study from city solving a gross short circuiting problem.

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## DAY TWO

8:00 am to 8:30 am Registration

8:30 am to 10:00 am **SECTION 6 - Troubleshooting Aeration and Dissolved Oxygen Problems** - Factors competing for oxygen in a lagoon. How dissolved oxygen concentrations change in a lagoon and why that is important to you. Seventeen possible causes of low dissolved oxygen concentrations. Oxygen demand calculations. How to properly conduct a dissolved oxygen profile. Solutions to low dissolved oxygen concentrations. Troubleshooting low D.O. Case Study on how to solve odor and low dissolved oxygen problems.

10:00 am to 10:15 am Break

10:15 am to 12:00 pm **SECTION 7 - Pathogen Control.** Factors effecting bacteria, virus, and parasite die-off rates in lagoons. How to maximize a lagoon's natural disinfection process. Chlorine residual. **Maintenance.** What EPA inspectors look for when examining your pond system. Dike maintenance, erosion control, vegetation control, leaky ponds and the importance of record keeping. When lagoons go bad and what to do about it.

12:00 pm to 1:00 pm Lunch

1:00 pm to 3:00 pm **SECTION 8 - Industrial Lagoon Troubleshooting** - The difference between industrial and municipal lagoon systems. Optimizing anaerobic ponds used to treat industrial wastewater. Nutrient deficiencies — feeding an industrial lagoon system for optimum performance.

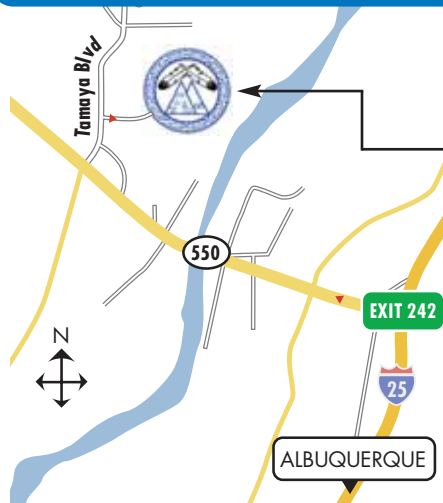
3:00 pm to 3:15 pm Break

3:15 pm to 4:30 pm **SECTION 9 - Cold Weather Operations** - How water temperature affects the chemistry and biology of a lagoon system. How temperature affects pond mixing. Cold weather operations. Predicting water quality based on changes in temperature. **Wrap up.** Case study on actual lagoons meeting very high effluent quality standards, and the costs of one city's painful lagoon decommissioning. Evaluations and Certificates



The Pueblo of Santa Ana's Amerind facility is truly one of the very best state of the art training centers in New Mexico. This spacious classroom is equipped with the latest technology for all types of training presentations. You will thoroughly be impressed by it's friendly atmosphere, "it's almost like being trained in the comfort of your own home."

## Location Details for The Wastewater Lagoon Workshop



**Where:** Amerind Risk Management Corporation Facility, 502 Cedar Drive, Santa Ana, NM 87004 located just north of the Star Casino on The Pueblo of Santa Ana lands  
Phone: (505) 404-5000 or (800) 352-3496

**When:** Wednesday & Thursday May 12th-13th, 2010

**Attend Day 1 or Day 2 or Both**

Up to **12 CEUs** available



Sponsored by: The Pueblo of Santa Ana

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

### Wastewater Lagoon Optimization & Troubleshooting, comprehensive 2-day workshop

This workshop is normally **\$299** but through the sponsorship of **The Pueblo of Santa Ana** it's only

2 days, just ..... **\$30** per person

Name: \_\_\_\_\_

Municipality/Business: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ email: \_\_\_\_\_

Payment Amount: \$ \_\_\_\_\_ (please make checks out to: **The Pueblo of Santa Ana Utilities Department**)

Mail your registration and check to: **The Pueblo of Santa Utilities Department**  
2 Dove Rd, Santa Ana Pueblo, NM, 87004



### Class attendees can also get **BIG DISCOUNTS** on this manual! →

This manual was written by your presenter Steve Harris specifically for this 2-day workshop. It is available for just **\$70** (normally \$79.95 plus \$9 shipping through USA BlueBook). The manual closely follows the 2 day workshop — it's like taking the 2-day workshop home with you to your plant.

If you would like to buy a manual, simply make a copy of this registration form, fill it out, & send it along with a check to: **H&S Environmental, LLC**, 2122 E. Leland Circle, Mesa, AZ 85213. Make check payable to: H&S Environmental. Credit card orders can be made by calling 1 (602) 810-7420 or on line at [www.lagoonops.com](http://www.lagoonops.com). Books will be handed out the day of the class.

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