

The How and Why of Lab Procedures and Utilizing Results

By David Branham, OAWU Wastewater Technician

Aaaah... spring has sprung; new growth is on the foliage; temperatures are warming. Are you ready? You may be saying to yourself, what in the world is old Dave on about now, and what pray tell does spring springing have anything to do with lab procedures. Well let us take a look and see.

Many renewed permits (NPDES and WPCF) have been issued. Remember TMDLs?

The time has come for the implementation, the warning shots that were fired across the bow of wastewater systems are now a reality. The point source (which is the wastewater facility) is now the prime target, and the first shell to hit was, as many of you probably already know by now, is temperature.

Yes, yes, you may be saying to yourself, but when are you going to say anything about lab procedures? Well I'm getting there. As I have stated several times in the past, TMDLs are here to stay. They are not going away and no amount of resistance is going to make them go away. The temperature issue that many of you now have to address is, as I have previously stated, now a part of your operating permit.

Are you ready? Were you ready as the first salvo hit in the fore-castle? Bear in mind it was only the first of many to come. Ammonia, nitrate, nitrite, heavy metals and many many more are to come. Altogether, there may be as many as twenty or more new regulations on loadings.

This once again brings me to my point, are you ready? Can we continue to operate the wastewater system as we have in the past? I think not. Many of the smaller systems are ill-prepared to meet the new challenges and regulations, and I am afraid to admit, some of the larger systems may also be lagging behind in some areas.

Fastly waning are the days when a wastewater system needed little attention. Lagoons and even some activated sludge systems have, in the past, been notorious for lack of operation and attention.

Lagoon systems will not escape the new regulations as well as many package plants and small activated sludge systems.

So finally, I will get to the point. How is your lab? Do you have the laboratory equipment needed to correctly operate your system? Do you have the knowledge? When lab results are determined, whether you have performed the test yourself or had it outsourced, do you know the significance of the results and how to correctly make adjustments to your system based on these results. Bear in mind that the lab results are the life blood of your system.

As an activated sludge operator, how much control do you have over the system? Going back to the basics, there are three major operational controls for an activated sludge system. Can you name them? Lab testing and the results should be playing a major role in the daily operation of your system. Results from the lab should be used to determine such things as SVI, F/M ratio, RAS, and WAS. If you were to use SVI to determine settling properties would you also use the sludge age to determine the settling properties? What is the F/M ratio coming into your plant? If your plant is bulking do you know what the cause is? Is it microbial or something else causing it? Laboratory testing and the results can give the answer to all these questions. Learn to use them; they are a very important and a valuable tool that can be used to help in the operation of your system.

Now let us turn our attention to the lagoon operator. By far the biggest offender in the lack of operation and attention is the lagoon. This is not to say that it is the operators fault, it just seems to be the nature of the beast. I mean, after all, it is just a big hole in the ground that the raw sewage pours into and some how miraculously gets treated, right guys? Well of course not. But unfortunately, this seems to be the perception the public and many city and sewer district officials have.

How many operational controls does the lagoon operator have? ... certainly not as many as the activated sludge operator to be sure. However, the operator does have some control, Adjusting the water levels in different cells, splitting influent flow, and aeration are some of the tools that may be used to help in operations.

Are laboratory testing and the results important in the operation of the lagoon? You bet it is. One thing that we must bear in mind is that a lagoon is more complicated than an activated sludge system in as far as microbial action and results are concerned.

So let's take a look at your lab. Humbug you say! We don't need a stinking lab, we're just a lagoon. Well maybe, and then maybe not. Remember, as I stated earlier in this article, almost everyone is going to be impacted by the TMDL rules. This may and probably will include nutrient removal from the lagoon. Are you ready? Can you remove or severely reduce phosphorus, ammonia, or nitrates leaving your system? Are you testing for these now? Do you know how to do these tests, or how to collect and properly preserve the sample if you are going to send them to a lab for analysis?

Whether the choice is between outsourcing the lab work or performing the lab tests onsite, it is apparent that more money will be needed to satisfy the new testing requirements. Laboratory test costs range from \$27 and up per sample. It is then just a simple matter of deduction as to whether it is feasible to buy the equipment needed to perform the needed tests or use the services of a commercial laboratory.

Onsite testing is less expensive than using a commercial laboratory; however, one must have the expertise, building and equipment to perform such tasks. I highly recommend that an activated sludge facility have onsite the equipment and qualified personal to perform any and all tests that the system may need for operational control.

Also highly recommended for any wastewater system and I emphasize **any system**, is at the very least, a pH meter and a good DO meter. What should the minimum mg/L be for DO in an aeration basin? Do you know? And how about the facultative lagoon, is pH important? And why do you need to know? Believe me it is a little more than unsettling to ask what the DO is in the aeration basin and to be told, "I don't know; we don't have a DO meter". Or ask what the pH is in the primary lagoon is only to be told, "I don't know; I don't have a pH meter".

Tools. Tools are important; you wouldn't or couldn't open or shut a valve without a valve wrench or check the voltage without a meter would you? So why try to run a wastewater system without the proper laboratory equipment. A thought for you to ponder! The wastewater system is the second most regulated industry in the country, second only to the nuclear industry.

You are the operator; it is your responsibility to see that the correct and proper operation of the system is being observed. If you don't have the proper tools, get them! You are not alone, if you run into any resistance in obtaining the tools needed, read the operation permit. It clearly states that the system must have the proper tools and equipment so as to operate correctly.

Most of you are members of our association and even if your system is not, feel free to call myself or any of my associates at 503- 873-8353 and we will be more than glade to be of assistance in helping you obtain any lab equipment that is deemed necessary for the operation of your system. See ya next time down the road—and remember keep those bugs happy. Dave