

## Our Lake

Last week, we devoted quite a lot of space on septic systems. There is one item of information that residents need to know. If your house waste water system is served by a cesspool, the property cannot be transferred in a real estate sale. For further details, you can Google NJ DEP code N.J.A.C. 7.9A - 3.16a and b on page 31 and 32, revised in June of 2012. The reason I mention this is because there have been at least two instances of houses in our lake community with cesspools that have had to upgrade their systems in order to comply with the code before selling their property. Under 7.9A - 12.6, page 113, the code describes a protocol for any septic inspection conducted for real property transfer.

This week we received a mid-year report from both of our consultants. Our Eco System consultant focuses mostly on the lake water chemistry. He was the designer/supplier of our in-lake aeration equipment. Our Princeton Hydro consultant focuses on the lake water ecology/habitat. Both of these aspects are extremely important since one area influences the other.

With that in mind, I think it would be beneficial to comment on these two reports. If you were at the Stockholder's Annual meeting, you may have obtained a copy of each. Both consultant's report that the lake fishery is under stress. This condition is caused by lack of dissolved oxygen in the water in the mid-layer depths at and below 5 meters where the water is cooler. Fish require more than 5 mg. /l. of dissolved oxygen (DO) and below 20 C for cold water fish. Where the dissolved oxygen is sufficient, the water is too warm. This past month of July, we experienced a problem with the 40 HP compressor but it is now fixed and back in service. The lake has developed a very strong thermocline at 6-7 meters depth with little mixing. More compressor capacity available should result in higher DO in the lower depths where the water is still cool. What happens to the DO that we infuse into the water?

The lake has a biological oxygen demand (BOD). When organic material decays (called respiration), oxygen plays a key role in this process. The depletion of the oxygen occurs at a higher rate when the decaying bio mass is greater. For example, at the time of writing this article, the lake is at the final stages of an algal bloom. Most of the decaying mass will drop out of the upper water and the lake water will begin to clarify. However, as the decaying material uses up more DO, the environment at lower depths becomes anoxic and devoid of oxygen. This is where the biology aspect affects the chemistry aspect.

The bottom of the lake contains a rich mixture of nutrients containing among other things phosphorus. As the respiration process continues in the anoxic environment, the chemical process releases soluble phosphorus. The last test I performed on the 14 meter depth water sample was off the chart on ortho phosphate. Because our lake is phosphorus limited, the amount of phosphorus in the water controls the amount of algae and plant growth. The iron we added in early spring will hopefully react with much of this phosphate before it migrates to the upper waters and becomes the fuel for next year's algae bloom. I am optimistic that we will see better days ahead for our lake's clarity.

We will have a WQ meeting on the 9<sup>th</sup> at 9 AM on the porch.

Paul Sutphen

