



WHY WE NEED LAKE AERATION



Lake Health

Even though our lake is part of a storm water retention system, just like natural ponds and lakes, it is a valuable resource. It adds to the beauty of the landscape, is a habitat for fish and wildlife and an additional water source if needed. However, the good health of our lake is held in a delicate balance. A lake's condition deteriorates when the bottom environment cannot support animal life. The bottom is the area that runs out of oxygen first, it is where the most oxygen is used and it is the farthest from the surface where it is replenished. Without oxygen its self purification capability is not only reduced, it is reversed. The small animals, snails, worms, bacteria, etc., which help keep a pond clean cannot live and the pond's nutrients are then recycled from the sediment. This forms a layer of muck at the bottom which serves as a fertilizer for weed and excessive algae growth. It could also cause large fish kills.

Aeration

Aeration means adding air to the water. To restore a lake to health, it is essential to get oxygen down to the lake bottom. Lake aeration not only adds oxygen to the surface water but to the water at the bottom of the lake as well. Once the lake is full of oxygen near the bottom, beneficial aquatic insect larvae, snails, fresh water shrimp, and other fish food can begin to live on the bottom and littoral zone (light zone).

Lake deterioration begins when the BOD (Biological Oxygen Demand) cannot be met. When too much pollution enters a lake, plant and algae growth dies and sinks to the bottom, resulting in an overload of organic sludge. Lower forms of life on the lake bed die and this debris rots. Anaerobic bacteria, which needs no oxygen, give off deadly poisonous gases, such as hydrogen sulfide, ammonia, and methane. These gases, as they rise through the water, unite with and bind up and dissolved oxygen remaining in the water. Fish will then die from lack of oxygen. By pumping compressed air out onto the lake bed diffuser, the rising air bubbles bring the bottom water to the surface. Large volumes of water release pollutant gases to the air and pick up more oxygen while on the surface. If oxygen is present at the lake bed, dead organisms will not accumulate but will quickly be consumed by aerobic bacteria, thus providing for a healthier lake environment.

Waterfalls, streams and fountains do provide good oxygenation, but only effectively aerate the top four feet of a body of water. Large-scale pond applications are often deeper than five feet and require a forced air system.

Forced Air - This type of system has a air compressor that sits on shore where ever you have electric & shelter, then an air line is ran out to the bottom of the pond, at the end of the air line is a device called a diffuser which breaks the air down into extremely small bubbles. The column of bubbles coming from the bottom acts like a air lift and brings the bottom waters that are void of oxygen to the surface where it picks up oxygen and takes it back down to the bottom. The result is a constant turn over of the body of water maintaining oxygen at the bottom where you need it.

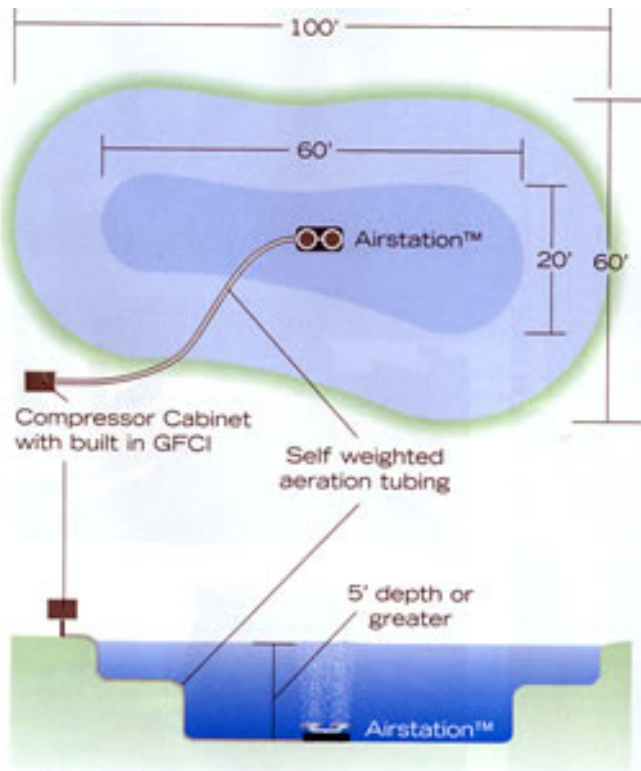


Fig. 1 EUTROPIC POND

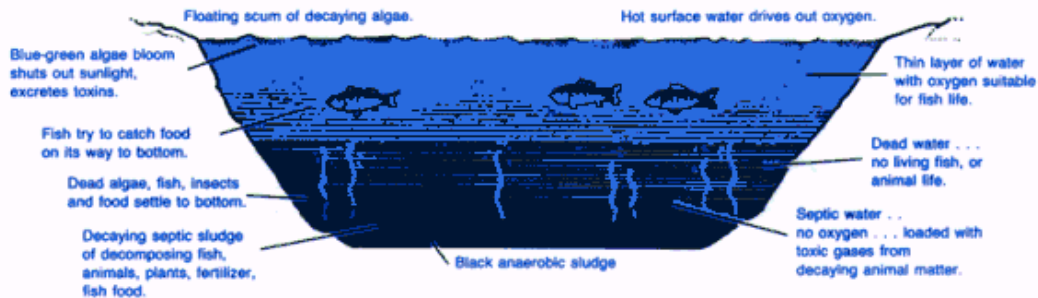


Fig. 2 Artificial circulation of pond water solves many problems.

