

# **Big Bubble Circulation (BBC) 'Bits of Information'**

## **Making Waves in City Park**

The first manufactured Big Bubble Circulation (BBC) pump sits on the bottom of a lake in Brewton, Alabama fed by an on shore ¾ hp rocking piston compressor. Our U.S. Patented BBC pump is generating hundreds of 5-inch bubbles every minute. These large bubbles expand as they move to the surface lifting and drafting water from the bottom. When the bubbles reach the surface, they explode and the cold bottom water they are transporting produces a large visible mound on the surface. The heavy surge of cold low-oxygen water from the depths of the lake travel across the lake's surface absorbing oxygen and creating ripples that are visible across the entire lake from the location where the mound originally formed all the way to the shore.

## **Lake's Hidden Top Layer**

When the water in a lake or pond is still, hydrogen bonding causes the surface molecules to act as a skin. This results in surface tension that forms a layer on the water which prevents oxygen movement between the air and the water. The atmosphere contains 18% to 20% oxygen. Even though there is abundant oxygen in the air just above the water, on a still day no oxygen can move through the impervious skin on top of the water.

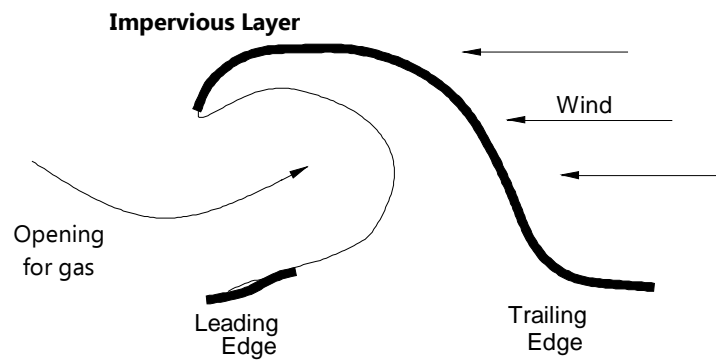
## **Ripple Science**

When wind moves across a body of water it causes the top layer of water to move. This action forms ripples in the direction of the wind. Ripples create openings along their length where gases can travel through the impervious layer. Each ripple is a wave with the same characteristics as large waves. The wind pushes the trailing edge of each ripple faster than the leading edge, thereby creating movement and height. This also creates an opening in the impervious layer where gas transfer happens.

A straightforward way to see this phenomenon is during a surfing contest. As the waves get nearer to shore, they slow down and the trailing edge goes over the leading edge creating a pocket for the surfer and allows gases to pass through the impervious layer.

A 10 mile-an-hour wind blowing across a lake creates the same ripples as the Big Bubble Circulation (BBC) pump. The only difference is the wind's ripples are straight line and the BBC's are circular. The ripples from either method create billions of openings through the impervious surface layer to allow gas movement. We call this phenomenon 'Visual Circulation' because the ripples on the surface show the area where circulation is happening.

As the ripples of cold water hit the shore, they break and sink back into the lake and then eventually return to the Big Bubble Circulation pump. This completes the circulation loop from the pump to the surface, across the surface absorbing oxygen to the shore, and back to the pump. This thorough circulation creates stability over the entire area regarding temperature and dissolved oxygen levels. This makes fish very happy.



**A Wave**

**Big Bubble Circulation + traditional Diffused Aeration System Advantages**

- A visual circulation area 3 acres or larger
- Much higher levels of dissolved oxygen and stable temperatures over the entire area being circulated.
- Less algae and undesirable plants
- Healthy water for fish and vertebrates
- Less solar radiation entering and heating the lake. This results because the ripples bend the light beams and prevent them from penetrating deep into the water.
- Fewer mosquitoes and other water borne bugs because they don't lay eggs in moving water.
- A large opening just above the Big Bubble Circulation pump in a frozen lake
- Leaves and other floating garbage are pushed to the lake's edges for easy removal.
- Less herbicides or chemicals are required because of a healthier circulation.

