

Annual LSMCA Meeting  
Nov. 6, 2019  
Water Quality Report  
Barbara Dove

Good evening, everyone. Tonight I will be reporting on the efforts to clean up the lake. Before I do, I would like to go over some of the history associated with the lake for those who are new or for those who would like a refresher on how we arrived here.

In Lake San Marcos, because of high phosphorus and low oxygen, the lake was declared impaired in 2002. Lake impairment is created over time from the buildup of certain nutrients, such as nitrogen and phosphorus, which many of us would recognize as fertilizer components. Phosphorus, in particular, encourages excessive plant growth and algal blooms in the lake. When these algae die, they consume oxygen. Fish and aquatic life can't survive without oxygen. This creates stratification with varying oxygen levels. The oxygen level is lowest in the deepest parts of the lake, where water circulates less.

In 2011, the State's Regional Water Quality Control Board required that a Remedial Investigation /Feasibility Study or RI/FS be done by CDC, San Diego County, Cities of San Marcos and Escondido, and Vallecitos Water District. The five entities submitted the report in 2016. The report characterized the condition of the water and its risk to humans and the environment. It outlined possible steps to improve water quality, especially reducing Phosphorus in the lake and the lake watershed. In other words, the RI/FS defined the scope of treatments.

In 2017, two pilot studies were conducted to reduce Phosphorus by adding aluminum sulfate, also known as Alum to the lake. Later, in 2018, Alum was used plus an algaecide to control the algae blooms. At the end of these pilot studies, phosphorus levels were lower. This year, a newer compound called PhosLock® which is made from clay and Lanthanum was used to combat Phosphorus. Results from this pilot test are pending.

This year, pilot testing efforts involved reducing Phosphorus in the LSM watershed. This is a huge area north and east of the lake that feeds into the lake via San Marcos Creek. The focus has been on finding ways to reduce Phosphorus in runoff before it reaches the lake. The Phosphorus in this runoff is typically from fertilizers, cleaners, and wastewater, and is readily taken up by algae and plants.

In January, Phosphorus removal in the watershed was carried out in two ways. The first was using another aluminum compound, called ACH (Aluminum Chlorohydrate). It binds to Phosphorus creating flocs that prevent the Phosphorus from being released. The tested area was at the mouth of the San Marcos Creek near the north end of the lake. Second, runoff from rainwater was retained in the La Cienega Basin and allowed to infiltrate into the ground thus reducing phosphorus from flowing into the lake. Results showed lower Phosphorus levels.

In the near future, aeration and selective withdrawal of the lake waters are planned. 12 air diffuser pods (think "bubblers" like in a fish aquarium) will be placed on the bottom of the lake with air pumped from on-shore blowers. The diffuser pods will be placed near the dam and go up to Sunrise Point. The purpose will be to oxygenate the water where it is needed most - in the deepest waters creating a vertical mixing column disrupting harmful stratification. An aeration pilot test is scheduled for Jan. 2020.

Selective withdrawal is also planned for irrigating the Executive Golf course. Withdrawal of lake water from a shallower end of the lake will be replaced by pumping groundwater from two new wells into the deeper end of the lake. This will enhance circulation of water movement in the lake, again, helping to prevent stratification. However, this action is pending approval of a permit for well groundwater discharges into the lake. Anticipated pilot testing of selective withdrawal is next summer.

So what's next after all these pilot studies are done? Their results will be used to determine the full-scale, long term remedies. Corrective Action Plans will be put into place to inactivate Phosphorus in the watershed and the lake. Plans will also be implemented for aeration and irrigation should they prove effective in their pilot tests. The adopted practices to address water quality will serve as long-term management practices.

Murray Rowe and I work together for the Water Quality Committee for the LSMCA. During our term on the board, we have strived to provide the community with fact based reports and updates on the lake quality. We do extensive reading on the State Water Board Geotracker website, attend meetings, consult with CDC, Great Ecology (CDC's consultant), the Water Board and long-time residents to find answers. We hope during our two year term we have made it easier for you to understand what has been happening.