

The CRWD is constructing a treatment wetland near the inflow to Cedar Lake. The treatment wetland will consist of a 2.9 acre sedimentation basin with a limestone treatment filter along its west boundary. The limestone treatment filter will be placed upslope of a wetland that is adjacent to Cedar Lake. The proposed wetland treatment basin volume will be approximately 16 acre-feet of storage and water quality treatment. Additionally, the basin will provide 24 hours of detention time for the 2 year precipitation event under most conditions and contain the runoff from the entire 2-inch event under most conditions.

The limestone treatment filter is approximately 960 ft in length and consists of 3/4 inch to 3 inch diameter limestone wrapped in a geotextile fabric and staked in place. The limestone itself is made up of calcium, carbon, and oxygen (CaCO_3). A main component of phosphorus that is in the water is phosphate (PO_4). As the water flows through the limestone filter, the phosphate component in the phosphorus comes in contact with the calcium in the limestone. The phosphate binds to the calcium and is essentially removed from the water.

The proposed treatment wetland is cited to capture the largest concentrated phosphorus inflow to Cedar Lake, a high-value recreational lake with good but declining water quality. Cedar Lake total phosphorus (TP) concentrations have historically been in the range of 30 ug/L. Starting in 2003, citizens complained of nuisance algal blooms and declining water quality. Annual average TP concentrations in the lake have periodically exceeded the state standard for TP (40 ug/L), and discrete concentrations sometimes exceed 100 ug/L. Citizens petitioned the CRWD to do projects in the watershed to improve the water quality in Cedar Lake. The proposed treatment wetland is one of several measures proposed.

Literature shows that conventional treatment wetlands alone remove about 50 to 60% of total phosphorus. Conventional treatment wetlands are good at removing particulate phosphorus; however, they are not as effective at removing dissolved phosphorus. Adding the limestone filter to target the soluble portion of the phosphorus load to Cedar Lake increases the expected P removal from 50-60%, to about 70-80%.

Cedar Lake receives about 3,000 lbs of total phosphorus annually from the upper watershed; this is most of the phosphorus load to Cedar Lake. To improve water quality in the lake, the CRWD has set a phosphorus loading goal of 1,000 lbs of phosphorus per year; this means a reduction of 2,000 lbs annually. The sedimentation basin addresses the removal goal of 1,200 lbs of particulate phosphorus. If the assumption is made that 40% of the total phosphorus load is made up of dissolved phosphorus, the goal of the limestone treatment filter would be to remove 800 lbs of dissolved phosphorus per year.