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The City of Santa Clara’s Central Park is used for social events such as international swim meets, summer events, and the Arts & Wine Festival. Central Park Pond (Pond) is the central feature and focal point of the park. Historically, potable water was used as make-up water to keep the Pond filled. Pond water quality had been an issue for the City and required frequent cleaning, which was a labor intensive effort and improved water quality for a brief period of time. The primary cause of pollution was attributed to water bird feces and the nutrients associated with this waste led to issues with odor and algae blooms.

To address Pond water quality issues and to reduce the use of potable water, the City embarked on a project to install a Pond water treatment system and to add the ability for the City to use recycled water in the Pond. The project included a preliminary evaluation of Pond water quality, confirmation of the design criteria, and final design and construction of a water quality system and recycled water pipeline connection to the Pond.

For the selection of an appropriate treatment system for Pond water two technologies were investigated and included conventional filtration and wetland treatment system. A wetland based treatment system was ultimately selected as the preferred option because of lower life-cycle costs, the fact that it was a “green technology”, and the level of maintenance effort that would be required. The wetland treatment system is a two-stage up-flow system that includes pumping, aeration, biological treatment in a media bed covered with wetland vegetation. The arrangement of inlet strainers, skimmers and recycle pipelines provide a system of circulation that helps keep solids suspended and reduces the need for Pond maintenance.

A discussion of the design of the wetland treatment system and the recycled water pipeline connection are discussed in this paper.

The preliminary evaluation was completed in September 2013 and final design was completed in February 2014. System constructed started in April 2014 and became operational in June 2014. The initial costs savings due to potable water offset are estimated to be approximately $ 123,000 on a twenty year life cycle basis (in today’s dollars) based on the reducing filling required. This paper is being written approximately one month after system startup and as a result, limited analytical data on system performance is available. It is expected that the Pond wetland treatment system will take several weeks to reach a steady state as the biological system matures in the wetland system. This steady state is will also be dependent on the seasonal variations (temperature, rainfall, evaporative losses), as well as concentrations of the constituents in the water. Based on visual observations and feedback from City staff, Pond water quality has improved and rapid degradation in water quality appears to be less of an issue. Further testing is anticipated to determine the long term impact on the wetland treatment system on water quality.