

HIGHLIGHTS

Bench and pilot-scale testing of numerous treatment scenarios to select the best treatment alternative.

Bench-scale testing of pre-oxidation including ozone, chlorine dioxide, and peroxone.

Focus group meetings with client staff and national experts to determine best testing program.



*A thorough bench-scale test protocol resulted in significant cost savings by reducing the alternatives and length of the pilot testing.*

Carollo, in association with others, conducted an extensive study to develop the best treatment process to meet future regulations for the proposed Lake Pleasant Water Treatment Plant. The study included both a bench-scale evaluation and pilot studies.

The bench-scale testing included assessment of raw water quality, development of finished water quality goals, and the evaluation of current and future treatment technologies. Focus group meetings with client staff and national experts resulted in recommendations for developing the bench-scale testing program. Bench-scale testing covered pre-oxidation, pretreatment, and advanced treatment processes for several key test waters. Pre-oxidation included ozone, chlorine dioxide, and peroxone. Treatment processes included dissolved air flotation (DAF), ballasted flocculation, and granular activated carbon (GAC) filtration. Advanced treatment processes included a range of presently available membrane options. The team compared these to conventional treatment. The testing focused on two primary parameters: turbidity removal and dissolved organic carbon (DOC) removal. Additional parameters included arsenic removal.

Based on the bench-scale testing, the team developed select treatment options for pilot-scale testing. The key objective of this phase was to narrow the treatment options that would meet the water quality goals and select the best treatment options for the proposed new treatment plant. The result was the construction of a total of six pilot plants.

In addition to the treatment trains at each of the pilot plants, work included feeding effluent from select filter media columns and microfiltration to rapid small-scale column test (RSSCT) equipment to evaluate the effectiveness of GAC post-contactors for total organic carbon (TOC) removal and bed life. The team also conditioned microfiltration effluent with acid and anti-scalant as a pretreatment for nanofiltration and reverse osmosis testing. Pilot trailer systems allowed short-term pretreatment testing with DAF and ballasted flocculation on Central Arizona Project (CAP) water, algae-spiked CAP water, and high-turbidity CAP water.

The project team completed pilot plant work over the summers of 2000 and 2001. The new Lake Pleasant Water Treatment Plant is scheduled to be operational in 2007.