

## Groundwater Filtration Project - Wells No. 5 and 10

### HIGHLIGHTS

Arsenic residual waste sensitivity analysis.

Two 2,500-gpm pressure filtration constructed at a cost of only \$0.40/gallon.

Evaluation study conducted initially as a process-screening step.

In 2001, the City of Garden City, Idaho, was faced with the task of treating two wells that had moderate levels of iron and manganese. Average concentrations of iron in Wells No. 5 and No. 10 were 0.6 and 0.2 mg/L, respectively. Average concentrations of manganese in Wells No. 5 and No. 10 were 0.3 and 0.2 mg/L, respectively. As a result of both constituents exceeding EPA's secondary drinking water limits, the City experienced routine customer complaints regarding colored water, stained laundry, and stained plumbing fixtures. An important side issue was the presence of arsenic at trace levels in the groundwater.



*Carollo completed design and construction management for two 2,500-gpm oxidation/filtration facilities at under \$0.50/gallon construction cost.*

Initially, Carollo conducted a desktop evaluation to narrow down the list of treatment options from four to one. Working with the City, Carollo recommended an oxidation, granular media filtration process that would meet the City's needs. Carollo was also able to provide technical support to the City during this initial predesign stage when progress was slow due to permits required by various local agencies.

Carollo selected a pre-purchase strategy to help reduce design and construction costs typically incurred when equipment selected by the contractor differs in size or layout from the engineers' intent. After evaluating proposals for the pre-purchase of filtration equipment, Carollo finished design and provided construction management services. Two facilities similar in layout and size (2,500 gpm each) were constructed. Carollo worked with the City to obtain temporary discharge permitting for the concentrated backwash waste. By controlling the accumulation of backwash waste, the City can slowly discharge waste every several weeks to the sanitary sewer and not upset plant operations at the wastewater facility. Total arsenic concentrations of the discharge waste are low enough so as not to create any issues with the land application of biosolids or plant effluent water quality.