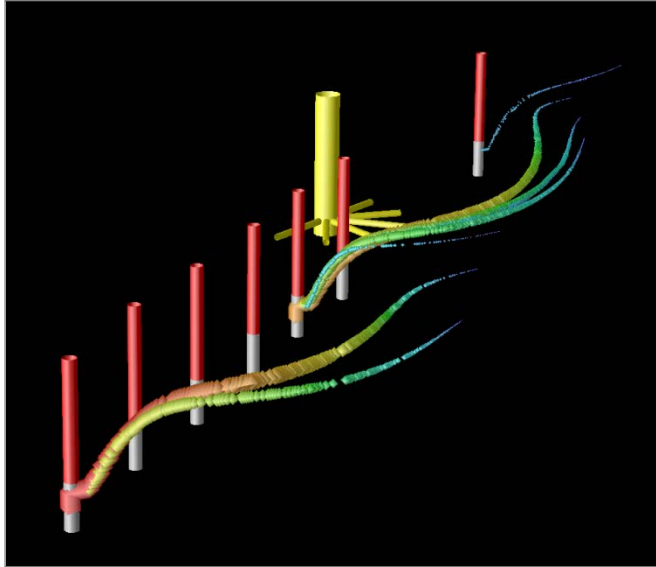


Optimizing Pumping to Minimize Water Hardness and Treatment Costs

St. Joseph, Missouri



Simulated path lines and travel times (illustrated by color variations) from the Missouri River to wells at the St. Joseph Well Field.

Key Project Areas

Well Field Management

Groundwater Flow Modeling

Water Quality

Missouri American Water constructed the St. Joseph Well Field to take advantage of treatment benefits gained from shifting its source water from surface water to groundwater. With the change in water source came a change in mineral content; the previous source of supply was the soft Missouri River water, and many customers interpreted the increase in hardness as deterioration in water quality. The utility decided to soften all the raw water from the well field in order to meet customer expectations.

Layne was hired to develop a plan for well field operation that minimized raw water hardness and optimized treatment costs. Raw water quality samples indicated that hardness varied among the wells. Specifically, the softer water was pumped from the vertical wells near the river, and the harder water was pumped from the collector well.

We used groundwater flow modeling to optimize water quality in the well field. Our analysis explained why hardness varied in the new well field and we developed an operating plan for Missouri American Water that minimized hardness and substantially reduced chemical costs.

