

Dry-Year Yield Wellhead Treatment for Nitrate and Perchlorate

HIGHLIGHTS

Pre-design perchlorate and nitrate treatment system.

Developed detailed cost estimates for perchlorate and nitrate treatment (ion exchange and biological).

Developed mass balance for model perchlorate and nitrate blending.

The City of Ontario selected Carollo to evaluate alternatives for treating nitrate and perchlorate in the contaminated groundwater in order to meet production goals as part of the Dry-Year Yield (DYY) Program.

The DYY program is a conjunctive use program between Metropolitan Water District of Southern California, Inland Empire Utilities Agency, Chino Basin Watermaster, and Chino Basin appropriators (eight agencies throughout the basin, including the City of Ontario). This program is implemented under the Chino Basin Optimum Basin Management Program (OBMP). Phase I of the OBMP deals with characterizing the water quality of the Chino Basin, and Phase II deals with implementing OBMP facilities to secure safe yield of the basin.

The DYY program will help the City to ensure that local water supplies meet the demand of a growing community by reducing reliance on imported water during dry years. The new Well No. 44, wellhead treatment, and construction of a central treatment facility are necessary to provide a safe and reliable water supply for the City. This project includes:

- ▶ Source water characterization.
- ▶ Identification and systematic evaluation of feasible treatment alternatives for perchlorate and nitrate.
- ▶ Selection and demonstration of the appropriate treatment technology.
- ▶ Design and construction of a wellhead treatment system.



Carollo is helping the City to evaluate alternatives to treat nitrate and perchlorate in contaminated groundwater in order to reduce reliance on imported water during dry years.

The project also includes pre-design of a central treatment facility for a number of wells. The primary subject well is a new Well No. 44, but other impacted wells in the surrounding area (Wells 3, 4, and 9) are included as part of the initial evaluation. A preliminary test on Well No. 44, showed an average nitrate concentration of 51 mg/L and a perchlorate concentration at 4.7 $\mu\text{g/L}$. The nitrate concentration for other surrounding wells ranges from non-detect to 58 mg/L and perchlorate from non-detect to 12 $\mu\text{g/L}$. The presence of perchlorate in these wells implies that the treatment, permitting, and disposal issues associated with perchlorate will be the critical factor in this project despite the high nitrate concentration.