

Working Within the California Regulatory Process to Change Water Quality Objectives to Promote the Large-Scale Recharge of Recycled Water

By Mark Wildermuth¹, Joseph LeClaire¹, and Andrew Malone¹

Chino Basin stakeholders participated in the Santa Ana Watershed-wide TDS and Nitrogen Investigation. The purpose of this investigation was to develop scientifically-based TDS and nitrogen objectives for groundwater based on the State Water Resources Control Board (SWRCB) Executive Order 68-16 which requires that the Regional Boards develop water quality objectives based on ambient water quality conditions that were present at the time that the first Basin Plan was developed. Such objectives are referred to as antidegradation or non-degradation objectives. Wildermuth Environmental (WEI) developed the scientifically-based methods to compute ambient TDS and nitrogen concentrations in 1973 (corresponding to the anti degradation objectives) and in 1997 (corresponding to the then current ambient concentration). The proposed objectives for the northern Chino Basin Management Zones ranged from 260 to 290 mg/L for TDS and 4 to 5 mg/L for nitrogen. Current ambient TDS and nitrogen concentration were 300 mg/L and 7.4 mg/l – implying no assimilative capacity for TDS or nitrogen. The implication of no assimilative capacity is that the TDS and nitrogen mass added to groundwater from the use of recycled water for irrigation and recharge would have to be mitigated at great cost.

WEI developed a proposal to the Regional Board on behalf of the Chino Basin stakeholders to establish higher TDS and nitrogen objectives that would allow the recharge of recycled water without direct mitigation. The proposal was consistent with SWRCB Executive Order 68-16 and California Water Code section 13241 which provides criteria to be used in establishing water quality objectives. One of the keys to using this section of the water code was the extraordinary groundwater management program being implemented by the Chino Basin stakeholders. WEI was successful in assisting the stakeholders in raising the TDS and nitrogen objectives to 420 and 5 mg/L for TDS and nitrogen, respectively. WEI was able to demonstrate through technical, financial and institutional analyses that raising the objectives would promote maximum beneficial use of waters of the State and be protective of beneficial uses. WEI was successful in working with other stakeholders in other groundwater basin in obtaining similar maximum benefit-based objectives in the Beaumont, San Timoteo and Yucaipa Basins. The Chino, Beaumont, San Timoteo and Yucaipa Basins are the only basins in California with TDS and nitrogen objectives based on maximum benefit criteria.

The large-scale use of recycled water for irrigation and recharge is crucially important for meeting the water demands in the southwest. This paper will describe the regulatory framework that governs recycled water use, the process to establish and change objectives, and the technical demonstrations that were required to raise groundwater quality objectives to levels that promote large-scale recycling and protect beneficial uses.

¹ – Respectively, President, Vice President and Principle Scientist, Wildermuth Environmental, Inc., Lake Forest California

Mr. Wildermuth is the president and CEO of Wildermuth Environmental, with 30 years of experience in water resources engineering, and has developed groundwater basin and watershed-wide water resources management plans in the San Jacinto Basin for Eastern Municipal Water District; Chino Basin Optimum Basin Management Program for the Chino Basin Watermaster, and many others.

Mark Wildermuth, P.E.
CEO/President
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
Tel: 949-420-3030
Fax: 949-420-4040
mwildermuth@wildermuthenvironmental.com

Dr. LeClaire, COO/Vice President of Wildermuth Environmental, Inc. has 23 years of professional experience in water resources, hazardous waste engineering, and groundwater chemistry. His technical expertise is in the area of equilibrium chemistry and mobility of trace metals and organics in the unsaturated zones of soils and in groundwater.

Joseph P. LeClaire, Ph.D.
COO/Vice President
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
Tel: 949-420-3030
Fax: 949-420-4040
jleclaire@wildermuthenvironmental.com

Andrew Malone
Senior Scientist
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
Tel: 949-420-3030
Fax: 949-420-4040
amalone@wildermuthenvironmental.com

Mr. Malone is an Associate Scientist with Wildermuth Environmental with 15 years of experience in water resources and geologic sciences. His technical expertise is in the areas of sedimentary geology, tectonics, basin characterization, hydrogeologic and hydrologic analyses, aquifer mechanics, Geographic Information Systems (GIS), and database design and implementation.