ABSTRACT

NITRATE LOADING IN GROUND WATER FROM EASTERN SAN JOAQUIN VALLEY, CALIFORNIA USING DELTA NITROGEN-15 AND DELTA OXYGEN-18 ISOTOPIC RATIOS

Nitrate concentrations in parts of the San Joaquin Valley have been found to exceed the U.S. Environmental Protection Agency's maximum contaminant level (MCL) for drinking water. Twenty wells located along a 4.6 km transect southeast of Fresno County were sampled for nitrate content. Vineyards and orchards are predominantly cultivated in the area and nitrogen fertilizers have been applied consistently since the 1950's. $\delta^{15}N$ and $\delta^{18}O$ isotopic ratios of nitrate were evaluated to identify any denitrification occurring along the flow path and to identify possible nitrate sources. Nitrate concentrations are above the MCL in 45 percent of the wells sampled; however, the nitrate concentrations decreased with groundwater depth. The isotope data do not indicate that denitrification is occurring in this part of the aquifer; therefore, the decrease in nitrate concentrations suggests groundwater mixing or dilution by fresh ground water as the contaminated irrigation water travels downwards and along the flow path.

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