

El Mirage Chromium Water Table Study, USGS

Fact Sheet

Organization Performing SEP	USGS
Description of Work Performed, Other Details	<p>The purpose of this study was to determine the source of the high chromium concentrations in the watertable wells at a dairy on the distal part of the Sheep Creek fan near El Mirage. The scope of this study included drilling and instrumentation of unsaturated zone monitoring sites: (1) in a field historically irrigated with dairy wastewater, and (2) in a previously un-irrigated field that received its first application of dairy wastewater in spring 2008.</p> <p>Data collected as part of this study were compared and contrasted with data collected as part of a regional study of chromium and chromium isotopes in rock, alluvium, and water from wells in the western Mojave Desert.</p> <p>The data collected for this study indicate that the source of high-chromium concentrations in water-table wells at the dairy is naturally occurring chromium mobilized from the unsaturated zone as a result of irrigation with dairy wastewater. This conclusion is supported by (1) the occurrence of high concentrations of chromium in the unsaturated zone beneath the dairy, (2) increases in chromium concentrations at the water table after infiltration of irrigation return water, (3) the isotopic composition of chromium in the saturated and unsaturated zone beneath the dairy, and (4) comparison of the stable isotopes of oxygen and hydrogen in water samples from the dairy and the chemical milling facility. In addition, laboratory studies done as part of this study show that interference in the microbiologically mediated reduction of Cr (VI) to Cr (III) by high nitrate concentrations in dairy wastewater may allow chromium, in the form of Cr (VI), to remain mobile in the unsaturated zone and reach the water table.</p>
SEP Status	Completed
Watershed in which SEP was performed:	Mojave River
County in which SEP was performed:	San Bernardino
Latitude of Project	34.6
Longitude of Project	117.6
Begin Date	Spring 2008
End Date	Spring 2009
Project Budget	\$ 280,000.00
Water Quality Benefit or Objective	Water Quality Enhancement
Associated Enforcement Order	Settlement Agreement, Consent Judgement BCV 07833
Enforcement Order Date	6/29/2004
Discharger Funding SEP	Molycorp Inc.
Violation Leading to Enforcement Order	Violation of WDRs
Total Assessed Penalty	\$1,125,000.00
Number of SEPs Funded Under Enforcement	6
Lahontan RWQCB Staff Assigned to SEP Oversight	Christy Hunter