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For Immediate Release

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## Naturally high levels of chromium found in groundwater

A toxic chemical usually associated with industrial activities occurs naturally in groundwater in California's Mojave Desert, sometimes at levels that exceed California drinking-water standards, the U.S. Geological Survey has found.

Chromium-6, also known as hexavalent chromium, can have many toxic effects on humans, such as stomach ulcers; damage to liver, kidney, circulatory and nerve tissues, and skin irritation. Hexavalent chromium also may be a carcinogen.

While it is used as an industrial compound, chromium-6 occurs naturally in rocks in the Mojave Desert, where it can enter deep aquifers that are tapped for drinking water.

A USGS study team found two drinking-water wells where naturally occurring chromium-6 exceeded the California Maximum Concentration Limit (MCL) of 50 micrograms per liter. (This MCL is for total chromium only; California does not have an MCL for Chromium-6.)

A microgram per liter represents 1 part per billion (ppb), equivalent to one cent in \$10 million. An MCL is a health-based threshold under state or federal law

Other wells also contained chromium-6, but at levels below the California MCL.

Prior to this study, concentrations of hexavalent chromium in excess of 50 micrograms per liter were assumed to be the result of human contamination. The best-known case was in the Mojave Desert town of Hinkley, where chromium-6 used by a public utility as an anti-corrosion agent contaminated local wells.

"The bottom line is that chromium-6 can occur naturally at concentrations higher than the MCL," said John Izbicki, the lead USGS scientist on the study.

The study results were published in the journal *Applied Geochemistry*. To read the article, go to the USGS California Water Science Center Web site at [http://ca.water.usgs.gov/news/releaseJune9\\_2008.html](http://ca.water.usgs.gov/news/releaseJune9_2008.html).

Increasing population growth in arid areas has raised concern about naturally-occurring concentrations of chromium. The USGS team examined the geologic abundance and isotopic composition of chromium in rock, alluvium, and groundwater from two areas in the western Mojave Desert: the Sheep Creek fan west of Victorville and the Surprise Spring area northwest of Twenty-nine Palms.

Water samples from 157 public-supply, irrigation, and observation wells were analyzed. Chromium-6 concentrations in the water ranged from less than the detection limit of 0.2 to 60 micrograms per liter.

Water from two wells in alluvial deposits underlying the Sheep Creek fan exceeded the California MCL for chromium. Concentrations were higher in this area because of high chromium in source rock from the San Gabriel Mountains. Izbicki said both wells are used as a source of drinking water.

The study also developed techniques to distinguish naturally occurring chromium from man-made sources.

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