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Evaluation of total chromium and iron in some underground waters of the richest mines of ferrochrome at the northeast of Iran

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Anaerobic ground waters may contain chromium and iron at concentrations up to several milligrams per liter without discoloration or turbidity in the water when directly pumped from a well. Chromium and iron are essential trace elements for human health. However, higher concentrations of these two ions in drinking water than the standard levels defined by Occupational Safety and Health Administration (OSHA) cause toxicity and may lead to a wide range of cancers. The purpose of this paper is to present analytical results for total dissolved Cr and Fe in some underground waters of the richest mines of ferrochrome at the northeast of Iran. These results are part of a larger study of the occurrence and distribution of rare metals in the mentioned region.

Samples used in this study were collected from existing domestic, agricultural, and public supply wells, and from selected observation wells using portable pumps. These samples were collected in September 2007 and were analyzed within hours of sample collection by atomic absorption spectroscopy. Our findings showed that total chromium and iron concentrations in the selected underground waters ranged from 1-7 and 0-4 mg/l, respectively.