

Evaluation of Extent and Bioavailability of Chromium Contamination Near an Abandoned Strip Mine. (4698)

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Abstract:

Chromium is a potentially toxic element to plants and animals commonly associated with serpentine and anthropogenic sources. An abandoned Cr strip-mine at US National Guard Camp SLO, CA containing serpentinitic parent material was tested for total and bioavailable Cr in the soil and overlying vegetation via US EPA Methods 3050a (Total Cr) and 1311 (Total Characteristic Leaching Procedure, TCLP) (US EPA, 1995), respectively. The analysis of total and bioavailable Cr was used to assess the risk of nearby surface and groundwater contamination and to evaluate the site's need for remediation. In addition, trends in soil Cr levels with respect to slope position and sampling transect were identified. Total and most bioavailable Cr concentrations in plants were below the method detection limits (Total_{MDL} = 0.12 mg L⁻¹; TCLP_{MDL} = 0.04 mg L⁻¹), suggesting the Cr was immobile and not bioavailable. The average total Cr level was 403.5 +/- 177.6 mg kg⁻¹, significantly below the background total Cr level of 829.4 +/- 213.6 mg kg⁻¹. Based on Chromium's immobility, and its low levels in the site relative to background concentrations, remediation practices were not recommended. No significant trends were observed in total soil Cr levels along any transect or between sampled slope positions. The information gained from this was used by Camp SLO officers to assess the threat of Cr mobility and bioavailability in the soils at this site, as well as in nearby waterways and ground water.

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