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## Potential toxic elements contamination and human health risk assessment in surface soils of an industrial area, south central Iran

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The purpose of this study was to determine the concentrations, contamination level, distribution, health risk and potential sources of heavy metals in sub-urban soils from industrial area in south central Iran. A total of 66 top soil samples from Bandar Abbas County south district were collected and analyzed for Cr, Cd, Pb, Zn, Cu, Ni and As using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The Geo-Accumulation Index (Igeo), Pollution Index (PI) and Pollution Load Index (PLI) were calculated to assess the pollution level in the industrial soils. The Hazard Index (HI) and Carcinogenic Risk (RI) were used to assess human health risk of heavy metals. Also, multivariate statistical analysis and Geographical Information System (GIS) were used to source identification and prepare distribution maps of heavy metals, respectively. Results showed that the contamination levels of heavy metals were in the descending order of Cu>Cd>Pb>Zn>As>Ni>Cr. Moreover, based on Principal Component Analysis (PCA), Cd, Zn, Cu, and Pb originated mainly from anthropogenic sources including power plants, oil and gas refinery, steel and zinc production factories and municipal waste landfills and sub-urban soils were highly polluted these metals. For non-carcinogenic effects, Hazard Indexes (HIs) of studied metals decreased in the order of Cr >As>Cd>Pb>Ni>Cu>Zn. Arsenic, chromium and cadmium were regarded as the priority pollutants. Carcinogenic risks due to Cd and As in sub-urban soils were within tolerable risk to human health. However, children faced more health risk in their daily life than adults via their unconscious ingestion and dermal contact pathway. These results provide basic information of heavy metal pollution control and environment management in this industrial area.

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