INVESTIGATION OF CHEMISTRY CONTROLLING THE MOBILITY OF CHROMIUM IN CONTAMINATED LANDS

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Potentially hazardous levels of chromium (Cr) have been identified in soils, surface water and groundwater caused by use of process waste, originating from a former chemical works. The contaminated sites are amenable to an integrated approach of remediation. The most significant form in which chromium exists is Cr(VI), which is toxic, carcinogenic and mobile. The key technical objective for each technique was to effect reduction in total Cr(VI) and leachable Cr(VI) concentration such that a significant risk was no longer presented to sensitive human, ecological receptors or controlled waters.Innovative techniques were used for treating chromium contamination in soils at several sites. During the ex-situ physicochemical trial proprietary chemicals were used to treat Cr through a chemical reduction orstabilisation process. The optimal formulation demonstrated a capability of reducing both total soil Cr(VI) (by up to 86%) and leachable Cr(VI) concentrations to low levels. The in-situ physicochemical bench scale trial comprised testing slurries of reducing and immobilisation reagents including E-clays, bentonite, slag and OPC. Several of the slurries formulated demonstrated a capability of reducing total soil Cr(VI) by up to 95%. New experiments discovered that treatment used rust material as source of iron (II) to convert Cr(VI) to Cr(III) and also different manipulations with reduction effect of ferrous sulphate are techniques what show the fastest and most effective way of Cr reduction.