



Environmental Impacts Of Zirab Coal Washing Plant, Mazandaran, Iran

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Extraction and beneficiation operations associated with coal mining increase the rate of chemical reaction of waste material to air and water media. Zirab coal washing plant is located on the bank of the Cherat stream in Mazandaran province, Iran. coal Mined from central Alborz coalfield mines is not suitable for use in Iranian Steel Corporation. Hence, coal ash content is reduced by physical and chemical processes in this plant. These processes leave a large quantity of liquid and solid wastes that accumulate in waste dump and tailing dam. sediment and water samples taken from Sheshrudbar and Cherat streams and also from Talar river show high concentration of Cd, Mo and As in water samples of coal washing plant and the associated drainage. Eh-pH diagrams revealed the chemical species of elements in water. The enrichment factor and geoaccumulation index show that Cd, Hg, Mo and V are enriched in bottom sediments of the coal washing plant and decrease with increasing distance from the plant. Sequential extraction analysis Results of three sediment samples of Cherat stream show that silicate bound is the major phase in samples taken before and after the plant, but adjacent to the plant, organic bound is dominant. The high concentration of Cd and Mo in the water soluble phase, is noticeable and may result in high mobility and bioavailability of these elements. Mann-Whitney and Wilcoxon tests on six samples, before and after the coal washing plant support the obtained results.

Keywords: Zirab; coal washing plant; Sequential extraction analysis; Mann-whitney; Wilcoxon; Enrichment factor; Geoaccumulation index.