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Evaluation of the diffuse contamination of soils caused by residues coming from the large scale production of phosphate fertilisers

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The obtaining of phosphate fertilizers results in large amounts of residues that are frequently accumulated in deposits or pools occupying a wide area. These residues are acidic, and contain variable amounts of trace elements and radionuclides. The potentially polluting agents can be leached by rainwater, and so transferred to the surface waters and then to the groundwater after soil infiltration. Since the distribution and thickness of the residue deposits are variable, the contaminants cannot be easily traced back to a single, well defined source, and so a diffuse contamination (nonpoint source pollution) of the surrounding soils and waters occurs.

This communication reports the results obtained in the study of soils close to the phosphogypsum deposits placed near Rio Tinto (Huelva, Spain). The zone is affected not only by the mentioned residues but also by the tides due to the vicinity of the sea. The samples studied had a low organic content and a low acidity with average values of 30 mS/cm for the EC. The mineralogical study allowed illite, goethite, quartz, gypsum and kaolinite to be identified as the main mineralogical components. Although the arsenic level was relatively high (about 600 mg/Kg) the data proved that this element is not mobilized into water. Analytical data for ^{238}U , ^{234}U, ^{235}U, ^{228}Th, ^{230}Th, ^{232}Th, ^{226}Ra, ^{228}Ra, ^{210}Po, ^{40}K , ^{137}Cs were also obtained.