

PEDOGENE ARSEANREICHERUNG IN GRUNDWASSERBEEINFLUSSTEN BÖDEN DER HEUBACHNIEDERUNG IM SÜDWESTLICHEN MÜNSTERLAND

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SUMMARY

Exceeding the measure value according to the Federal Soil Protection Decree because of pedogenic enriched arsenic in soils influenced by groundwater

Within the scope of preparing the digital soil contamination map for the district of Recklinghausen increased total contents of arsenic were determined exceeding the measure value of 50 mg/kg for grasslands according to the Federal Soil Protection Decree inside a lowland in ferric gleysols strongly influenced by groundwater. To estimate the endangering an investigation of the upper soils in a selected area in the district of Recklinghausen along a transect was carried out. The aim of the investigation was to get a good knowledge about the spatial distribution of the arsenic contents depending on the influence of the ground water. Besides this the distribution of the total arsenic content in a representative soil profile was investigated.

The results show, that the arsenic contents in the upper soils as well as in the soil profile correlate to a high degree with the contents of the precipitated iron oxides and hydroxides in the fluctuation area of the ground water. Dissolved arsenic (III) and arsenic (V) oxoanions enter the unsaturated soil zone with the ground water. Here they can adsorb onto the iron hydroxides, which are an adsorption reservoir for the arsenic oxoanions under high redoxpotential conditions. Under reductive conditions Fe(III) can be microbially reduced and the arsenic oxoanions will be mobilized and transferred in the hydro- and biosphere.