



Heavy metal retention of different roadside soils

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Emissions from major highways contain different kinds of contaminants such as heavy metals, polycyclic aromatic hydrocarbons and road salts which can occur in both particulate and dissolved form. Pollutants are transferred to the environment via aerial transport or the infiltration of road runoff and spray water. A significant rate of the road runoff infiltrates into the Embankment which is usually built during road construction and located next to the road edge. Especially in the long term development there is an increasing problem of soil contamination and groundwater pollution.

According to valid German law, newly constructed hard shoulders have to provide a specific bearing capacity to enable trafficability in emergency cases. Therefore the applicable materials consist of accurately defined gravel-soil mixtures, which can fulfil this requirement. To determine and compare the total and dissolved concentrations of Pb, Cd, Zn, Cu, Ni, Cr in the road runoff and seepage water of newly constructed embankments, we installed 6 Lysimeter along the edge of the German highway A115. Three lysimeter were filled with different materials which are recently used for embankment construction in Germany. Three further lysimeter were installed and filled with plain gravel, to observe the distribution, quantity and quality of road runoff.

First results showed that heavy metal concentrations determined in the road runoff were comparable to literature values. The solute concentrations in the seepage water of the different embankment materials do not show considerable differences and exceed the trigger values of the German Federal Soil Protection & Contamination Ordinance (BBodSchV) only sporadically. Total concentrations of the seepage water are significantly higher than solute concentrations and clearly differ between stable and non stable variant. In order to estimate the risk of groundwater pollution further monitoring of seepage water quality is necessary.