Utilization of sediment in a former domestic refuse dump

Pelzer Jürgen[1], **Guhrke Torsten**[2]

[1]Federal Institute of Hydrology, Am Mainzer Tor 1, 56068 Koblenz, Germany
Phone: +49-(0)-261-13065276
[2]Local Waterways New Building Office Berlin, Mehringdamm 129, 10965 Berlin, Germany
E-mail: **juergen.pelzer**@bafg.de

Introduction: The extension of federal waterways inside former East Germany is one of the projects summarized in the traffic project "German Unity". About 30 Mio. m³ of dredged material have to be managed during the extension of the waterways [1]. A part of the fine grained dredged material is contaminated with heavy metals and organic pollutants and therefore has to be conditioned and disposed of as waste at landfill sites [2].
As a result of the efforts to reduce the amount of waste, a lot of German landfills are no longer in use and have to be closed. Suitable material is frequently needed to profile the required surface of the dumping grounds. Efforts are being made in order to prevent natural resources and to use recycled waste for profiling.
An example is given below which shows how to use sediment as an inexpensive substitute material in a former domestic refuse dump.

Methods: The dredged material was taken from a part of the Havel canal located west of Berlin. Chemical parameters were analyzed in the dredged material according to the relevant German standards (DIN). The aerosis rate (GB_{21}) based on the determination of the amenability to anaerobic digestion [3] and the respiratory activity (AT_4) were determined according to the methods required in the German Waste Deposition Regulation (AbfAblV) [4]. The shearing strength was determined with the German field vane test [5]. The former domestic refuse dump which has to be profiled with mineral material is located south of Berlin and has an area of about 0.5 km².

Results and discussion: The main component of the contaminated dredging material consists of sandy mud which has been deposited on the bottom of the canal during the last five decades. The sandy mud is polluted with cadmium, copper and polycyclic aromatic hydrocarbons (PAHs), but can still be used to profile a landfill. It is assumed that the contamination is caused by discharges from sanitary landfills.
The shearing strength of the original material is to low to use it as substitute material for the leveling course of a landfill. The required stability was reached by blending the sandy mud with additional sand and gravel.
The total organic carbon content in the sandy mud is too high to exclude it as a risk for the formation and discharge of landfill gases. Because the organic substances are already subjected to intensive microbial transformations in the sub-aquatic sediments, it is helpful to determine the gas-forming potential. The relevant tests have demonstrated that the formation of gases is very low.

References: [1] Pelzer et al. (1999) *Wasserwirtschaft* 9:438-441; [2] Jansky et al. (2000) *TerraTech* 4:44-50; [3] DIN 38414-S 8 (1985); [4] AbfAblV *BGBl.* 2001 I:305; [5] DIN 4094-4 (2002)