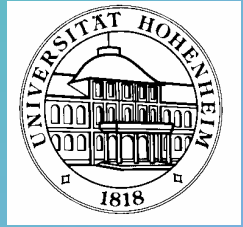


# Assessment of potential heavy metal contamination in alluvial soils of the Vatern valley close to Vişeu de Sus (Romania)



Frank-Michael Lange<sup>1</sup>, Christian Biernath<sup>2</sup>, Carsten Marohn<sup>3</sup>, Emil Luca<sup>4</sup>, Thomas Gaiser<sup>5</sup>

<sup>1</sup> Institute of Soil Science and Land Evaluation, University of Hohenheim, D-70599 Stuttgart; [fmilange@uni-hohenheim.de](mailto:fmilange@uni-hohenheim.de).

<sup>2</sup> Institute of Soil Science and Land Evaluation, University of Hohenheim, D-70599 Stuttgart; [CJBiernath@aol.com](mailto:CJBiernath@aol.com).

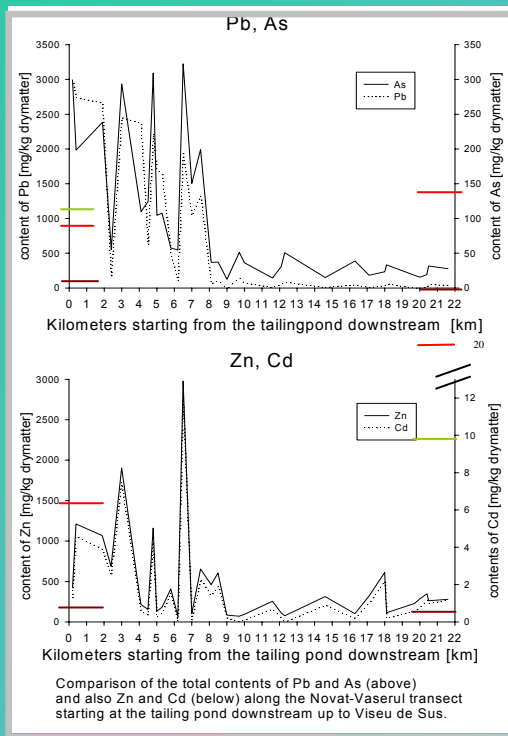
<sup>3</sup> Institute of Soil Science and Land Evaluation, University of Hohenheim, D-70599 Stuttgart; [marohn@terra-fusca.de](mailto:marohn@terra-fusca.de).

<sup>4</sup> Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine, RO-3400 Cluj-Napoca; [emil.luca@email.ro](mailto:emil.luca@email.ro).

<sup>5</sup> Institute of Soil Science and Land Evaluation, University of Hohenheim, D-70599 Stuttgart; [tgaiser@uni-hohenheim.de](mailto:tgaiser@uni-hohenheim.de).

**Introduction:** On the 10th of March 2000 a catastrophic eco-disaster occurred in northern Romania: A tailing pond of the Baia Borsa mines (district Maramures/Romania) burst after heavy precipitations and thaw. About 20 000 t heavy metal contaminated sludge flooded the Novaţ- and Vaser Valey and reached the rivers Vişeu and Tiza.

In summer 2003 a team of soil scientists investigated the alluvial soils of the Novaţ- and Vaser Valey, from the contamination source to the mouth into the river Vişeu (about 20 km). Along the river the top soils were sampled and analysed for heavy metals (As, Cd, Pb, and Zn) by means of ICP in aqua regia digests every 500 m.



● Points where soil was sampled along the transect; P1 – P5: Soilprofiles

Parameter	Dimension	LAGA 20	BBodSchV	
			administrative level	preventive level (sandy soils)
As	mg/kg drymatter	150	n/a	n/a
Pb	mg/kg drymatter	1000	1200	40
Cd	mg/kg drymatter	20	10	0,8
Zn	mg/kg drymatter	1500	n/a	230

## Conclusions :

- ② extremely high contents of Pb and As within the first 8 km downstream the source. The contents go beyond the thresholdlevels of the German “BBodSchV” and the Z2 levels of LAGA 20.
- ② the contents of As, Cd and Zn go beyond the preventive levels for sandy soils (which we have in this area) and also do not drop below the preventive levels in the lower river sections.
- ② the high contaminated soils are not used by agricultural activities or settlements, there is no direkt risk for the population. But indirektly, if flood caused by melting snow and heavy rain erodes the contaminated topsoils along the river and transports it into the lower sections of the river.



A meadow contaminated with sludge which is due to the disaster, September 2003.