

Broder J. Merkel
Andrea Hasche-Berger
Uranium in the Environment
Mining Impact and Consequences

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Andrea Hasche-Berger
(Editors)

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Mining Impact and Consequences

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Preface

Uranium is an element to be found ubiquitous in rock, soil, and water. Uranium concentrations in natural ground water can be more than several hundreds $\mu\text{g/l}$ without impact from mining, nuclear industry, and fertilizers. Considering the WHO recommendation for drinking water of 15 $\mu\text{g/l}$ (has been as low as 2 $\mu\text{g/l}$ before) due to the chemical toxicity of uranium the element uranium has become an important issue in environmental research.

Besides natural enrichment of uranium in aquifers uranium mining and milling activities, further uranium processing to nuclear fuel, emissions from burning coal and oil, and the application of uranium containing phosphate fertilizers may enrich the natural uranium concentrations in soil and water by far.

In October 1995 the first international conference on Uranium Mining and Hydrogeology (UMH I) was held in Freiberg being organized by the Department of Geology at the Technical University Bergakademie Freiberg by the support of the Saxon State Ministry of Geology and Environment. Due to the large scientific interest in the topic of uranium a second conference (UMH II) took place in Freiberg in September 1998. Furthermore, in September 2002 scientists working on the topic of uranium mining and hydrogeology attended the third conference (UMH III) which was jointly held together with the International Mine Water Association (IMWA) Symposium 2002. The reviewed papers and posters of the 2002 conference have been published by Springer entitled Uranium in the aquatic environment (edited by Merkel, Planer-Friedrich and Wolkersdorfer).

The immense interest in the third conference showed the still existing high significance of international exchange and interdisciplinary discussion of scientists in the field of uranium mining and remediation issues. In consequence of this, in September 2005 the fourth consecutive conference (UMH IV) was held in Freiberg. The conference addressed scientists and engineers working in the mining and rehabilitation business. The focus of the book is on uranium mining and milling sites, mining sites with considerable amount of uranium and radionuclides as by-products e.g. phosphate production for fertilizers, abandoned mines, clean up measures, natural attenuation, monitoring measures, modeling techniques, and risk assessment studies. Furthermore the book addresses scientist interested in Uranium in groundwater in general as well as water work managers and political decisions makers.

Freiberg, September 2005

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