

Contents



1	Uranium Boom in Namibia – Hausse or Baisse	1
	Helmut Mischo and Rainer Ellmies	
2	Rare earth elements in Australian uranium deposits	25
	Bernd G. Lottermoser	
3	IAEA Initiatives Supporting Good Practice in Uranium Mining Worldwide	31
	Peter Woods, Russel Edge, Martin Fairclough, Zhiwen Fan, Adrienne Hanly, Ib-rahim Miko Dit Angoula, Horst Monken-Fernandes, Haridasan Pappinisseri Puthanveedu, Marcelle Phaneuf, Harikrishnan Tulsidas, Oleg Voitsekhouvych and Tamara Yankovich	
4	Challenging Issues in Regulating Uranium Mining in Tanzania	41
	Firmi P. Banzi, Peter Msaki and Najat Mohammed	
5	Uranium leaching from a burning black shale deposit – present conditions and future scenarios	47
	Mattias Bäckström and Lotta Sartz	
6	Is enough information available to derive an overall EQS for uranium in French freshwaters, according to European Guidance?	55
	Karine Beaugelin-Seiller, Olivier Simon, Rodolphe Gilbin, Jacqueline Garnier-Laplace and Laureline Février	

7	Radiation exposure and environmental remediation at the Urgeiriça mine site, Portugal	63
	Fernando P. Carvalho, João M. Oliveira and Margarida Malta	
8	The modern hydrochemical state of the Mailuu-Suuriver and radioecological problem of the Fergana Valley	73
	Bekmamat Djenbaev, Umyt Karmisheva, Azamat Tilenbaev and Altinai Egemberdieva	
9	Social Licensing in Uranium Mining: Empowering Stakeholders through Information	79
	W. Eberhard Falck, Joachim H. Spangenberg and Dominic Wittmer	
10	Social licensing and Stakeholder Communication in Uranium Exploration and Mining	87
	W. Eberhard Falck, Julian Hilton, Henry Schnell and Harikrishnan Tulsidas	
11	Environmental radiation monitoring around uranium ore deposits and mining sites in India: An overview	95
	Amir H. Khan	
12	Optimization of Uranium In-situ Recovery Based on Advanced Geophysical Surveying and Borehole Logging Technologies	105
	Horst Märten, Andrea Marsland Smith, Jonathan Ross, Michael Haschke, Harald Kalka and Jens Schubert	
13	Fuzzy MCDA for remediation of a Uranium tailing	113
	Danyl Pérez-Sánchez, Antonio Jiménez, Alfonso Mateos and Alla Dvorzhak	
14	Uranium in phosphate fertilizers – review and outlook	123
	Ewald Schnug and Nils Haneklaus	
15	Uranium and Molybdenum transfer within the oxidized zone of uranium deposit	131
	Irina Semenova, Vladislav Petrov, Yana Bychkova, Lyubov Shulik and Jörg Hammer	
16	Release of uranium from weathered black shale in meso-scale reactor systems – first year of data	139
	Viktor Sjöberg and Stefan Karlsson	

17	Environmental Issues and Proposed Assessment of Feasibility of Remediation of the Legacy Sites of Mining and Milling in the Area of Sumsar-Shekaftar in Kyrgyzstan	147
	Isakbek Torgoev and Alex Jakubick	
18	Heavy metals and natural radionuclides in the water of Syr Darya River, Kazakhstan	155
	Bagdat Satybaldiyev, Hanna Tuovinen, Bolat Uralbekov, Jukka Lehto and Mukhambetkali Burkabayev	
19	Establishment of a database of uranium anomalies and zones in Mongolia	161
	Boris Vakanjac, Predrag Srna and Vesna Ristic Vakanjac	
20	Uranium, Rare Earths and NORM: Mining and current prospects in Australia's Northern Territory	169
	Peter Waggitt	
21	Technical Status of Mine Water Control in China and Its Development Strategy	177
	Hao Wang, Shuning Dong, Rui Chai and Qisheng Liu	
22	Revisiting a case study on uranium exposure linked to leukaemia – preliminary results	185
	Frank Winde, Ewald Erasmus, G. Geipel and A.A.A. Osman	
23	Virtual Geographical Environments as a tool to map human exposure to mining-related radionuclides	193
	Frank Winde and Emile Hoffmann	
24	Assessing risks associated with the flooding of mine voids on underground infrastructure and water resources in and around Johannesburg (South Africa)	201
	Frank Winde and Ewald Erasmus	
25	Hydrogeological testing for ISL uranium mining: some Australian experience	211
	Peter Woods and Ben Jeuken	
26	Remediation of a uranium geological exploration facility	221
	Wei Zhang, Lechang Xu, Xueli Zhang and Jie Gao	

27	Does wind energy production cause more radioactive doses than nuclear power plants?	229
	Gerhard Schmidt	
28	Impact of humic substances on uranium mobility in soil – A case study from the Gessenwiese test field, Germany	239
	Stefan Karlsson, Viktor Sjöberg and Bert Allard	
29	U-Th-Pb data as a tool for bordering small-scale regions of in-situ monazite mineralization	249
	Jan Mestan, Libor Volak and David Sefcik	
30	Sorption of U(VI) and As(V) on SiO ₂ , Al ₂ O ₃ , TiO ₂ and FeOOH: A column experiment study	259
	Sreejesh Nair and Broder J. Merkel	
31	Characterization of phosphogypsum deposited in Schistos remediated waste site (Piraeus, Greece)	271
	F. Papageorgiou, A. Godelitsas, S. Xanthos, N. Voulgaris, P. Nastos, T.J. Mertzimekis, A. Argyraki and G. Katsantonis	
32	Rare earth ore refining in Kuantan/Malaysia – the next legacy ahead?	281
	Gerhard Schmidt	
33	Uranium sorption onto the granites of Nizhnekansk massif	289
	Anna Shiriaeva	
34	REE fractionation and distribution of Fe, Ni and U in the soil-water-biomass system along the flow path of Gessenbach, Eastern Thuringia (Germany)	297
	Daniela Sporleder, Anja Grawunder and Georg Büchel	
35	The externalized costs of uranium mining in the United States	305
	Doug Brugge, Aparna Dasaraju, Yi Qi Lu and Brianna Dayer	
36	Microbial consortia in radionuclide rich groundwater	311
	Katja Burow, Sven Gärtner, Anja Grawunder, Erika Kothe and Georg Büchel	

37	Flooding of the underground mine workings of the old Witwatersrand gold/uranium mining areas: acid mine drainage generation and long term options for water quality management	317
	Henk Coetzee, Supi Tlowana and Mosidi Makgae	
38	Assessment of the success of rehabilitation at waste rock piles of the former uranium mining from the supervisory authority's perspective by the example of Schlema-Alberoda (Germany)	325
	Klaus Flesch and Andrea Sperrhake	
39	Microbes affect the speciation of various uranium compounds in wastes and soils.	333
	A.J. Francis	
40	Uranium induced stress promotes fungal excretion of uranium/metal stabilizing ligands: Analysis of metal-organic compounds with Size Exclusion Chromatography and Inductively Coupled Plasma-Mass Spectroscopy	347
	Anna Grandin, Anna Ogar, Viktor Sjöberg and Stefan Karlsson	
41	Passive treatment of heavily polluted drainage waters in a uranium deposit.	355
	Stoyan Groudev, Irena Spasova, Plamen Georgiev and Marina Nicolova	
42	At the crossroads: Flooding of the underground uranium leach operation at Königstein (Germany) – A 2014 status brief	363
	Ulf Jenk and Micheal Paul	
43	Do macrofungi accumulate uranium?	369
	Jaroslava Kubrová and Jan Borovička	
44	Treatment of Acid Wastewater Containing Uranium by Sulfate Reducing Bacteria.	377
	Jie Gao, Lechang Xu, Yalan Wang and Wei Zhang	

45	Current reclamation of historical uraniferous tailings dams and sand dumps – exacerbating the mess or minimizing the mining footprint? Case studies within the Witwatersrand goldfields.	387
	Mariette Liefferink and Simone L. Liefferink	
46	Challenges of water management during tailings remediation – Site and catchment-specific focus	401
	Thomas Metschies, Jan Laubrich, Jürgen Müller and Manja Haupt	
47	Thirteen Years Later: Status of the Moab UMTRA Project Long-term Remedial Action.	409
	Donald Metzler	
48	Overcoming the barriers to implementation of decommissioning and environmental remediation projects - a focus on uranium mining legacy sites. The CIDER Project	417
	Horst Monken-Fernandes and Patrick O'Sullivan	
49	Phytostabilization of uranium-containing shale residues using <i>Hieracium pilosella</i>	425
	Anna Ogar, Viktor Sjöberg and Stefan Karlsson	
50	Reliable water management as key success factor for the remediation of uranium production sites under humid conditions	433
	Michael Paul	
51	Mine Water Quality Evolution at Abandoned Uranium Mines in the Czech Republic	443
	Nada Rapantova, Monika Licbinska, Pavel Pospisil and Karel Lusk	
52	Glass Bead Filter Packs in Water Wells for Higher Efficiency and Reduced O & M costs	451
	Reinhard Klaus	
53	Soil hydrological monitoring in the framework of the remediation and long-term safeguard of uranium ore mining residues of the Wismut GmbH	461
	Katja Richter, Marcel Roscher, Ulf Barnekow, Gert Neubert and Manfred Seyfarth	

54	The New European Radiation Protection Safety Standards as Basis to Assess the Radiological State Achieved at Remediated Uranium Legacy Sites (WISMUT Sites) in Germany	469
	Peter Schmidt and Jens Regner	
55	Geochemical controls on U immobilization in the subsurface.....	477
	Malgorzata Stylo, Daniel Alessi, Shao Paul, John Bargar and Rizlan Bernier-Latmani	
56	Impact of Uranium Mill Tailings on Water Resources in Mailuu Suu, Kyrgyzstan	487
	Frank Wagner, Hagen Jung, Thomas Himmelsbach and Arthur Meleshyn	
57	Rhizofiltration of U by plant root surfaces in a tailing wetland	497
	Weiquing Q. Wang, Carsten Brackhage, Ernst Bäuker and E. Gert Dudel	
58	Temporal and Special Variation of Pore Water and Seepage Quality of an Abandoned Uranium Milling Tailings Impoundment	509
	Lechang Xu, Xueli Zhang, Jie Niu and Hui Zhang	
59	Neotectonics influence of identified active geological structures on the safety of uranium tailings production Dniprozherzhynsk industrial agglomeration (Ukraine)	519
	Yuliia Yuskiv and Valentin Verkhovtsev	
60	Re-Engineering Antibodies for Optimum Performance in Uranium Sensors	529
	D.A. Blake, B. Ban, X. Li, R.C. Blake II, G.A. Jairo and Y. Sun	
61	Longevity Estimates for a Permeable Reactive Barrier System Remediating a ^{90}Sr Plume	537
	Jutta Hoppe, David Lee, Sung-Wook Jeen and David Blowes	
62	Radon diffusion in rocks and minerals.....	545
	Fatima Zahra Boujrhali, Hanane Sabbani and El Mahjoub Chakir	

63	Solubility of Radium and Strontium Sulfate across the Temperature Range of 0 to 300°C	553
	Paul L. Brown, Christian Ekberg, Henrik Ramebäck, Hanna Hedström and Artem Matyskin	
64	Cost effective screening of mine waters using accessible field test kits – Experience with a high school project in the Wonderfonteinspruit Catchment, South Africa	565
	Lindsay Fyffe, Henk Coetze and Christian Wolkersdorfer	
65	Dispersion Modelling of Natural Radionuclides ^{238}U, ^{232}Th and ^{40}K Released from Coal-Fired Power Plants Operations	573
	Maria de Lurdes Dinis, António Fiúza, Joaquim Góis, José Soeiro de Carvalho and Ana Cristina Meira Castro	
66	Sequential Extraction of U and Th Isotopes: Study of Their Intrinsic Distribution in Phosphate and Limestone Sedimentary Rock in Comparison with Black Shale	581
	Said Fakhi, Rabie Outayad, Elmehdi Fait, Zineb Faiz, C. Galindo, Abderrahim Bouih, Moncef Benmansour, Azzouz Benkdad, Ignacio Vioque, Marusia Rentaria and Abdelmajid Noureddine	
67	Radium in Groundwater	591
	Stephanie Hurst	
68	Speciation analysis based design of mine water treatment technologies	599
	Andrea Kassahun, Corinne Lietsch, Nils Hoth and Michael Paul	
69	225 years uranium and radioactivity cross-links around the Brocken – Klaproth, Elster and Geitel, Nazi Research, Wismut prospection, and recent anomalies	609
	Friedhart Knolle, Frank Jacobs and Ewald Schnug	
70	Contamination of Water Bodies Affected by Post-Mining Activities in the Light of the European Water Framework Directive	617
	Elke Kreyßig and Jana Götz	

71	Changes of water composition in filtration processes due to natural geological formations obtained from opencast mines	625
	Adam Marek, Justyna Sobolczyk and Waldemar Bicz	
72	Distribution of uranium and thorium isotopes in colloidal and dissolved fraction of water from San Marcos Dam, Chihuahua, Mexico	635
	Z.K. Ortiz-Caballero, A. Covarrubias-Muñoz, M.E. Montero-Cabrera and M. Rentería-Villalobos	
73	Rn-222 - a potential health risk for thermal spas workers in Poland	643
	Jakub Nowak, Chau Nguyen Dinh and Paweł Jodłowski	
74	Measurement of indoor radon, thoron and their progeny concentrations in the dwellings of district Hamirpur, Himachal Pradesh, India	649
	Parminder Singh, Prabhjot Singh, B.S. Bajwa, Surinder Singh and B.K. Sahoo	
75	Soils and ground water's radioactive contamination into the local zone of the "Shelter" object and industrial site of Chernobyl NPP	657
	M.I. Panasyuk, I.A. Lytvyn, E.P. Liushnya, A.M. Alfyoroff, G.V. Levin and V.M. Shestopalov	
76	Investigation into the Transport of ^{238}U-series Radionuclides in Soils to Plants	665
	Danyl Pérez-Sánchez and Mike Thorne	
77	Development of a Biochemical Sensor for the Determination of Uranium in Aqueous Solutions	673
	Thomas Streil, Broder J. Merkel, Corina Unger and Bianca Störr	
78	Modelling of U Series nuclides disequilibria – presentation a modelling tool	681
	Juhani Suksi	
79	Comparison of Approaches in Slovenia and Kazakhstan in Managing Exposure to Radon	689
	Ivan Kobal, Janja Vaupotič, Asta Gregorič and Bolat Uralbekov	

80	Reactive transport simulation applied on uranium ISR: effect of the density-driven flow	699
	E. Bonnaud, V. Lagneau, O. Regnault and N. Fiet	
81	Uranium contamination of soil and groundwater by phosphate fertilizer application	707
	Mandy Hoyer	
82	Investigation of Phenomena in Uranium Mine Waters using Hydrogeochemical Modeling – a case study	717
	Corinne Lietsch, Nils Hoth and Andrea Kassahun	
83	3D Reactive Transport simulations of Uranium In Situ Leaching: Forecast and Process Optimization	725
	Olivier Regnault, Vincent Lagneau and Nicolas Fiet	
84	Where has all the uranium gone? Or what feeds Dimona – circumstantial evidence for an illicit fate of uranium from rock phosphate processing	731
	Ewald Schnug	
85	Planning of reactive barriers – an integrated, comprehensive but easy to understand modeling approach	739
	Markus Zingelmann, Mandy Schipek and Arnold Bittner	
86	Uranium in 31 Swedish ashes – differences between boiler type and fuels	745
	Naeem Saqib and Mattias Bäckström	
87	Characterization of natural phosphates and phosphogypsum	751
	Fatima Zahra Boujrhali	
88	Radioactivity assessment at the site of historical radium salts factory	759
	Fernando P. Carvalho, João M. Oliveira and Margarida Malta	
89	Hydrogeochemistry of Uranium in the Groundwaters of Serbia	769
	Marina Ćuk, Maja Todorović, Petar Papić, Jovan Kovačević and Zoran Nikić	
90	Seed crops: Alternative for non-remediable uranium mine soils	777
	Gerhard Gramss and Klaus-Dieter Voigt	

91	Using high temperature reactors for energy neutral phosphate fertilizer and phosphogypsum processing	785
	Nils Haneklaus, Harikrishnan Tulsidas, Frederik Reitsma and Ewald Schnug	
92	On-Line X-Ray Fluorescence Analysis of Uranium and Thorium Materials in Mining and Processing Industry	793
	E. Hasikova, A. Sokolov and V. Titov	
93	Nanofiltration of uranium-contaminated water – focus on separation mechanisms	805
	Michael Hoyer, Roland Haseneder, Robin Steudtner, Vinzenz Brendler and Jens-Uwe Repke	
94	Investigations of uranium and trace elements in groundwater of the Tanjero Area, Kurdistan Region, Iraq	811
	Aras Kareem, Broder Merkel and Omed Mustafa	
95	Radon measurement along faults in the Upper Rhine Graben with standardized methods	821
	Georg Kuhn, Rouwen Lehné and Andreas Hoppe	
96	Mulde River - A Uranium Mining Archive.	829
	Kay Nestler and Broder Merkel	
97	Mitigation of radon exposures caused by uranium mining legacies at WISMUT sites	839
	J. Regner and P. Schmidt	
98	Determination of uranium in mineral phosphate fertilizers using a low cost gamma spectroscope.	847
	Frank Jacobs, Sascha Riedl, Steven Sesselmann and Ewald Schnug	
99	The study of remediation activity of system plant-microorganisms in the model experiments of oil polluted soils	855
	Yerlan Doszhanov, Aygerym Gabdualiyeva, Galym Umbetkaliev, Yerdos Ongarbaev, Azhar Zhubanova and Zhulkhair Mansurov	
100	Laboratory and field test Study on Sandstone Permeability Characteristics	861
	Liu Zaibin, Jin Dewu, Dong Shuning and Liu Qisheng	