# 25th Annual International Conference on Soils, Sediments, Water and Energy 2009

Contaminated Soils, Sediments, Water, and Energy Volume 15

# Amherst, Massachusetts, USA 19-22 October 2009

### **Editors:**

Paul T. Kostecki Edward Calabrese **James Dragun** 

ISBN: 978-1-61738-888-0

#### Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

All papers Copyright© (2010) by their original authors All rights reserved.

Printed by Curran Associates, Inc. (2010)

The papers contained in this volume are available free of charge at the following websites: <a href="http://www.UMassSoils.com">http://www.UMassSoils.com</a> <a href="http://scholarworks.umass.edu/soilsproceedings/">http://scholarworks.umass.edu/soilsproceedings/</a>

Annual International Conference on Soil, Sediments and Water Environmental Health Sciences Department School of Public Health and Health Sciences N 344 Morrill Science Center University of Massachusetts Amherst MA 01003 USA

Phone: (413) 545-1239 dleonard@schoolph.umass.edu

The material contained in this document was obtained from independent and highly respected sources. Every attempt has been made to insure accurate, reliable information, however, the publisher cannot be held responsible for the information or how the information is applied. Opinions expressed in this book are those of the authors and/or contributors and do not reflect those of the publisher.

For permission requests, please contact the authors.

## **Table of Contents**

CO	NTRIBUTING AUTHORS	viii
FOI	FOREWORD ABOUT THE EDITORS	
ABO		
PAF	RT I: BIOREMEDIATION	
1.	LIMITED-ACCESS BIOREMEDIATION IN A FACTORY SETTING Deborah R. Farnsworth, Willard A. Murray, Daniel L. Bronson	1
2.	PERCHLORATE REDUCTION USING FINE MEDIA FLUIDIZED BED BIOREACTOR WITH OXIDATION-REDUCTION POTENTIAL-BASED FEED CONTROL Mamie Nozawa-Inoue, Dallas E. Weaver, Joseph E. O'Connell	7
3.	APPLICATION OF MICROEMULSION TO REMEDIATE ORGANOCHLORINE PESTICIDES CONTAMINATED SOILS Guanyu Zheng, Jonathan W. C. Wong	22
4.	BIOSURFACTANTS FROM <i>ACINETOBACTER CALCOACETICUS</i> BU03 ENHANCE THE BIOAVAILABILITY AND BIODEGRADATION OF	36

#### POLYCYCLIC AROMATIC HYDROCARBONS

Jonathan W.C. Wong, Zhenyong Zhao and Guanyu Zheng

#### **PART II: HEAVY METALS**

5. WIPE SAMPLING METHODOLOGIES TO ASSESS 52 EXPOSURES TO LEAD AND CADMIUM IN URBAN CANADIAN HOMES

Lauren T. McDonald, Pat E. Rasmussen, Marc Chénier, Christine Levesque

6. REMEDIATION OF A HEXAVALENT CHROMIUM 67
RELEASE TO GROUNDWATER USING ION-SPECIFIC
RESINS

Nancy E. Milkey

7. MERCURY DEPOSITION FROM RAIN AND SNOW IN 78 VIRGINIA

Douglas Mose, James Metcalf

8. AN INVESTIGATION OF THE NATURAL AND
ANTHROPOGENIC CONTRIBUTIONS OF ARSENIC
TO URBAN FILL SOIL

William R. Swanson, John A. Monacelli

9. ARSENIC CLEANUP CRITERIA FOR SOILS IN THE US AND ABROAD: COMPARING GUIDELINES AND UNDERSTANDING INCONSISTENCIES

Christopher M. Teaf, Douglas J. Covert, Patrick A. Teaf, Emily Page, Michael J. Starks

#### PART III: MODELING

10. USING GENETIC ALGORITHMS ON GROUNDWATER 103
MODELING PROBLEMS IN A CONSULTING SETTING
Karen M. Madsen, A. Elizabeth Perry

#### **PART IV: PESTICIDES**

11. USE OF BIOMARKERS AND PREDICTED 115 ENVIRONMENTAL CONCENTRATIONS (PEC) TO Table of Contents

	Juan Carlos Sánchez Meza, Pedro Avila Pérez, Manuel Borja Salin, Víctor F. Pacheco Salazar, Tom LaPoint	
PAF	RT V: PHYTOREMEDIATION	
12.	PHYTOREMEDIATION AS GREEN INFRASTRUCTURE AND A LANDSCAPE OF EXPERIENCES Frank Sleegers	132
PAF	RT VI: RADIONUCLIDES	
13.	RADON REMOVAL FROM POTABLE WATER SUPPLIED BY MUNICIPAL AND SINGLE HOME WATER WELLS Douglas Mose, James Metcalf	141
PAF	RT VII: REMEDIATION	
14.	IN SITU WASHING BY SEDIMENTATION METHOD FOR CONTAMINATED SANDY SOIL Wawan Budianta, Chris Salim, Hirofumi Hinode, Hideki Ohta	157
15.	FAST-TRACK REMEDIAL DESIGN OF FULL-SCALE ISCO APPLICATION USING PILOT SCALE TESTING AND FIELD SCREENING PARAMETERS Paul M. Dombrowski, Barbara A. Weir, Kara M. Kelly, James Brown	169
16.	REMEDIATION OF ACID TAR LAGOON Branko Druzina, Andrej Perc	195
17.	EX-SITU WELLHEAD TREATMENT OF 1,4-DIOXANE USING FENTON'S REAGENT Jackson H. Kiker, James B. Connolly, Willard A. Murray, Stuart C. Pearson, Stanley E. Reed, Robert J. Tess	210
18.	REMOVAL OF PERCHLOROETHYLENE WITHIN A SILT CONFINING LAYER USING HYDROGEN	227

RELEASE COMPOUND

$\mathbf{r}$	. 1		7. 4	_		1
1)0	niel	н	$\Lambda I$	11	rc	n
1)U	IUUCU		1 V I	u		u

19.	NITRATE REMOVAL FROM SYNTHETIC HIGH NITRATE WASTE BY A DENITRIFYING BACTERIUM Rashmi R. Nair, Pradip B Dhamole, Stanislaus F. D'Souza	236
20.	THE CAPABILITY OF BINARY SYSTEM CONTAINING WATER-SOLUBLE IONIC LIQUIDS FOR TYPICAL ENDOCRINE DISRUPTOR CHEMICALS EXTRACTION FROM SEDIMENTS Lei Wang, Guohua Zhang, Hongwen Sun, Shugui Dai, Teng Tu	256
PAK	T VIII: RISK ASSESSMENT	
21.	DETERMINATION OF ORAL OR DERMAL BENZENE EXPOSURE FROM CONTAIMINATED SOILS Mohamed S. Abdel-Rahman, Rita M. Turkall	262
22.	THE ICE STORM OF 2008 AND EMERGENCY RESPONSE COORDINATION THROUGHOUT WESTERN AND CENTRAL MASSACHUSETTS Jason J. Barroso, Sarah A. Rocklin, Kenneth J. Gendron	
23.	COMPARISON OF INTERNATIONAL RISK-BASED SCREENING LEVELS	284

#### **PART IX: SEDIMENTS**

24. CHEMICAL CHARACTERISTICS OF SEDIMENT OF 304
THE LOWER HACKENSACK RIVER, NEW JERSEY
Edward Konsevick, A. Brett Bragin

#### **PART X: SITE ASSESSMENT**

Amy Quintin, Lucy H. Fraiser

25. DYE TRACER STUDY—TRIED AND TRUE METHOD 337 YIELDS SURPRISING RESULTS

George F. Arsnow, Michael A. Vancil, Robert P. Schreiber, Cristina N. Ramacciotti

Table of Contents vii

26.	FLOATER/SINKER SITE ASSESSMENT COMPLICATED BY ASBESTOS Clifford A. Merritt	351
27.	A COMPARISON OF THREE SOIL CHARACTERIZATION METHODS ON A SOIL FORMED IN SANDY GLACIAL OUTWASH Michael W. Morris, Aimee Comeau, John T. Ammons, Ryan Blair, Changsheng Lu, Caroline Roberts	360

390

**INDEX**