Soil And Sediment Remediation

#Soil remediation #Sediment remediation #Environmental cleanup #Contaminated soil #Sediment pollution

Soil and sediment remediation encompasses various methods and technologies aimed at removing or neutralizing pollutants from soil and sediment environments. This process is crucial for restoring ecosystems, protecting human health, and mitigating the environmental impacts of industrial activities, accidental spills, and improper waste disposal. Effective remediation strategies often involve a combination of physical, chemical, and biological techniques tailored to the specific contaminants and site conditions.

Soil and Sediment Remediation

Soil and Sediment Remediation discusses in detail a whole set of remediative technologies currently available to minimise their impact. Technologies for the treatment of soils and sediments in-situ (landfarming, bioscreens, bioventing, nutrient injection, phytoremediation) and ex-situ (landfarming, bio-heap treatment, soil suspension reactor) will be discussed. The microbiological, process technological and socio-economical aspects of these technologies will be addressed. Special attention will be given to novel biotechnological processes that utilise sulfur cycle conversions, e.g. sulfur and heavy metal removal from soils. Also the potential of phytoremediation will be highlighted. In addition, treatment schemes for the clean-up of polluted megasites, e.g. harbours and Manufactured Gaswork Plants (MGP), will be elaborated. The aim of Soil and Sediment Remediation is to introduce the reader in: the biogeochemical characteristics of soil and sediments- new techniques to study soil/sediment processes (molecular probes, microelectrodes, NMR) clean up technologies for soils polluted with organic (PAH, NAPL, solvents) or inorganic (heavy metals) pollutants- preventative and remediative strategies and technologies available in environmental engineering novel process applications and bioreactor designs for bioremediation the impact of soil pollution on society and its economic importance.

Integrated Soil and Sediment Research: A Basis for Proper Protection

Increasing awareness of the irreversible and long-lasting impacts of deterioration and pollution of soils and sediments has had an important influence on environmental policies and research in the last decade. The complexity of the soil and sediment systems and its processes cannot be tackled properly unless scientists from different disciplines work together. With this in mind, a number of multidisciplinary soil research programmes have been started in various European countries. They involve different disciplinary approaches and they aim at different fields of application: agriculture, land use and town and country planning, drinking water supply, nature management. The results that are now appearing need to be integrated in a scientifically sound and useful way. The first European Conference on Integrated

Research for Soil and Sediment Protection and Remediation was intended to foster this. The volume contains the edited and selected proceedings of this Conference.

Contaminated Soils, Sediments and Water:

Volume 9 of the series presents 38 technical papers covering a wide range of environmental issues, including Bioremediation, Chemical Oxidation, Heavy Metals, MTBE, Phytoremediation, Radiation, Regulatory and Legal issues, Remediation, Risk Based Cleanup and Site Assessment. Contributing authors are drawn from across the spectrum of interest: government agencies, academic institutions, the consulting community and industrial companies.

Soil and Sediment Pollution, Processes and Remediation

Bioavailability refers to the extent to which humans and ecological receptors are exposed to contaminants in soil or sediment. The concept of bioavailability has recently piqued the interest of the hazardous waste industry as an important consideration in deciding how much waste to clean up. The rationale is that if contaminants in soil and sediment are not bioavailable, then more contaminant mass can be left in place without creating additional risk. A new NRC report notes that the potential for the consideration of bioavailability to influence decision-making is greatest where certain chemical, environmental, and regulatory factors align. The current use of bioavailability in risk assessment and hazardous waste cleanup regulations is demystified, and acceptable tools and models for bioavailability assessment are discussed and ranked according to seven criteria. Finally, the intimate link between bioavailability and bioremediation is explored. The report concludes with suggestions for moving bioavailability forward in the regulatory arena for both soil and sediment cleanup.

Bioavailability of Contaminants in Soils and Sediments

The purpose of this book is to help engineers and scientists better understand contaminated sediment sites and identify and design remedial approaches that are more efficient and effective. Contaminated sediment management is a difficult and costly exercise that is rarely addressed with easily identified and implemented remedies. It is hoped that this book can help identify and implement management approaches that provide an optimal, if not entirely satisfactory, solution to sediment contaminant problems.

Processes, Assessment and Remediation of Contaminated Sediments

The removal of contaminants and pollutants from natural or valuable materials is a critical issue in environmental management and conservation. Fundamentally, the procedure consists of measures employed to separate what is good (recyclable materials, soil and sediments) from what is bad (non recyclable materials, contaminants). A perspective of current technologies developed for mineral processing is of great assistance for finding appropriate solutions for different environmental situations. The liberation and separation processes adopted to recover valuable minerals from a gangue are, in principle, the same processes that can be applied to waste materials for recovering useful materials and to soil and sediments to reduce contamination. Separating Pro-Environment Technologies for Waste Treatment, Soil and Sediments Remediation investigates how technologies for separation, that take origin form mineral processing, have improved and evolved when applied to waste treatment and soil and sediment remediation.

Separating Pro-Environment Technologies for Waste Treatment, Soil and Sediments Remediation

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Integrated Soil and Sediment Research: A Basis for Proper Protection

Every spring, the University of Massachusetts - Amherst welcomes all "Soils Conference" Scientific Advisory Board members with open arms as we begin the planning process responsible for bringing you quality conferences year after year. With this "homecoming" of sorts comes the promise of reaching across the table and interacting with a wide spectrum of stakeholders, each of them bringing their unique perspective in support of a successful Conference in the fall. This year marks the 20^^ anniversary of what started as a couple of thoughtful scientists interested in developing partnerships that together could fuel the environmental cleanup dialogue. Since the passage of the Superfund Law, regulators, academia and industry have come to realize that models that depend exclusively on "command and control" mandates as the operative underpinning limit our collective ability to bring hazardous waste sites to productive re-use. It is with this concern in mind that the Massachusetts Department of Environmental Protection privatized its cleanup program in 1993, spurring the close-out of over 20,000 sites and spills across the Commonwealth to date, in a manner that is both protective of human health and the environment while also flexible and responsive to varied site uses and redevelopment goals. So we gather together again, this year, to hear our collective stories and share success and challenges just as we share stories at a family gathering. Take a read through the stories contained in these proceedings.

Contaminated Soils, Sediments and Water Volume 10

An unmatched reference on electrochemical technologies for soil, sediment, and groundwater pollution remediation Electrochemical technologies are emerging as important approaches for effective and efficient pollution remediation, both on their own and in concert with other remediation techniques. Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater provides a systematic and clear explanation of fundamentals, field applications, as well as opportunities and challenges in developing and implementing electrochemical remediation technologies. Written by leading authorities in their various areas, the text summarizes the latest research and offers case studies that illustrate equipment, installation, and methods employed in real-world remediations. Divided into nine sections, the coverage includes: Introduction and fundamental principles Remediation of heavy metals and other inorganic pollutants Remediation of organic pollutants Remediation of mixed contaminants Electrokinetic barriers Integrated (coupled) technologies Mathematical modeling Economic and regulatory considerations Field applications and performance assessment Unique as a comprehensive reference on the subject, Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater will serve as a valuable resource to all environmental engineers, scientists, regulators, and policymakers.

Soil and sediment pollution, processes and remediation, volume II

Many wetlands around the world act as sinks for pollutants, in particular for trace elements. In comparison to terrestrial environments, wetlands are still far less studied. A collaborative effort among world experts, this book brings the current knowledge concerning trace elements in temporary waterlogged soils and sediments together. It discusses factors controlling the dynamics and release kinetics of trace elements and their underlying biogeochemical processes. It also discusses current technologies for remediating sites contaminated with trace metals, and the role of bioavailability in risk assessment and regulatory decision making. This book is intended for professionals around the world in disciplines related to contaminant bioavailability in aquatic organisms, contaminant fate and transport, remediation technologies, and risk assessment of aquatic and wetland ecosystems.

Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater

Proceedings of the June 1994 title symposium held in Montreal, Quebec, Canada, and sponsored by the ASTM Committee on Soil and Rock. Papers identify and describe tests, methods, procedures, and materials used in support of dredging, treatment, and containment of contaminated sediments, and focus on

Trace Elements in Waterlogged Soils and Sediments

"Offers thorough coverage of the remediation of soils contaminated by hazardous wastes, including materials, analytical techniques, cleanup design and methodology, characterization of geomedia,

monitoring of contaminants in the subsurface, and waste containment. Cites specific case studies in hydrocarbon remediation that offer a concise overview of possible technological approaches."

Technology Alternatives for the Remediation of PCB-contaminated Soil and Sediment

Over the past 20 years, synchrotron-based research applications have provided important insight into the geochemical cycling of ions and the chemical and crystallographic properties of minerals in soils and sediments. Of particular significance is the understanding of local coordination environments with the use of X-ray absorption spectroscopy. The high flux and brightness of the X-ray beams have allowed researchers to work at environmentally relevant concentrations. The use of focusing mirrors and apertures which allow for mapping and trace particle surfaces, microbes, roots, channels and elements at the micron and at a nano-meter scale in 2 and 3D have also been a great enhancement to science. This book provides the most up-to-date information on synchrotron-based research applications in the field of soil, sediment and earth sciences. Invited authors provide chapters on a wide range of research topics including multiphase flow and transport processes (physical aspects), rhizosphere and microbial life (biological aspects), and dynamics of C, N, S, P and heavy metals and metalloids (chemical aspects). In addition, perspectives on the impact of synchrotron based applications, particularly X-ray absorption spectroscopy, and the role of synchrotron applications in remediation, regulatory, and decision making processes are considered. Up-to-date, with the latest research results and techniques in synchrotron-based techniques Information on specific techniques, elements and minerals, regulatory and remediation decision making, contaminants and the impact of X-ray absorption spectroscopy on soil science Internationally recognized leaders in their fields of expertise from Europe, North America, Asia and Australia

Dredging, Remediation, and Containment of Contaminated Sediments

In this text, drawn from presentations and discussion at a May 2005 NATO Advanced Research Workshop, current approaches to the assessment and remediation of contaminated sediments are discussed with emphasis on in-situ management. The text addresses physical, chemical and biological approaches for the assessment and remediation of sediments. The development of regulatory and strategic approaches is discussed with emphasis on the potential for biological remediation in the management of contaminated sediments.

Contaminated Sediments

An unmatched reference on electrochemical technologies for soil, sediment, and groundwater pollution remediation Electrochemical technologies are emerging as important approaches for effective and efficient pollution remediation, both on their own and in concert with other remediation techniques. Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater provides a systematic and clear explanation of fundamentals, field applications, as well as opportunities and challenges in developing and implementing electrochemical remediation technologies. Written by leading authorities in their various areas, the text summarizes the latest research and offers case studies that illustrate equipment, installation, and methods employed in real-world remediations. Divided into nine sections, the coverage includes: Introduction and fundamental principles Remediation of heavy metals and other inorganic pollutants Remediation of organic pollutants Remediation of mixed contaminants Electrokinetic barriers Integrated (coupled) technologies Mathematical modeling Economic and regulatory considerations Field applications and performance assessment Unique as a comprehensive reference on the subject, Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater will serve as a valuable resource to all environmental engineers, scientists, regulators, and policymakers.

Remediation Engineering of Contaminated Soils

This book offers various soil and water treatment technologies due to increasing global soil and water pollution. In many countries, the management of contaminated land has matured, and it is developing in many others. Topics covered include chemical and ecological risk assessment of contaminated sites; phytomanagement of contaminants; arsenic removal; selection and technology diffusion; technologies and socio-environmental management; post-remediation long-term management; soil and groundwater laws and regulations; and trace element regulation limits in soil. Future prospects of soil and groundwater remediation are critically discussed in this book. Hence, readers will learn to understand the future prospects of soil and groundwater contaminants and remediation measures. Key Features:

Discusses conventional and novel aspects of soil and groundwater remediation technologies Includes new monitoring/sensing technologies for soil and groundwater pollution Features a case study of remediation of contaminated sites in the old, industrial, Ruhr area in Germany Highlights soil washing, soil flushing, and stabilization/solidification Presents information on emerging contaminants that exhibit new challenges This book is designed for undergraduate and graduate courses and can be used as a handbook for researchers, policy makers, and local governmental institutes. Soil and Groundwater Remediation Technologies: A Practical Guide is written by a team of leading global experts in the field.

Synchrotron-Based Techniques in Soils and Sediments

This book provides a comprehensive overview of remediation and rehabilitation techniques and strategies for contaminated and anthropogenically disturbed land. Rehabilitation approaches in the urban environment, such as brownfield redevelopment and urban mining, are discussed. In relation to contaminated land, techniques for soil containment and decontamination of soil, soil vapour and groundwater are comprehensively and systematically presented. Complicated treatment techniques are schematically depicted and can be readily understood. Agricultural, silvicultural and environmentally sustainable rehabilitation strategies for reclaiming disturbed land/terrain in former mining or natural-resource extraction areas, such as open-cast mines, quarries, harvested peatlands, and subsided mining terrain (sinkholes), are introduced. This book will be a useful tool for students, researchers, private consultants and public authorities engaged in the treatment of contaminated or disturbed land.

Assessment and Remediation of Contaminated Sediments

Although valuable resources in river basins and other aqueous environments, sediments often receive much less attention from researchers, policymakers, and other professionals than other components of the ecosystem. Until now. Highlighting the important role that sediments play in the geoenvironment, Sediments Contamination and Sustainable Remediation focuses on sediment management for the purpose of environmental cleanup or management. It provides the in-depth understanding of the sediment-water environment needed to develop better management practices and meet sustainability requirements. The book discusses the contamination of sediments resulting from discharge of pollutants, excessive nutrients, and other hazardous substances from anthropogenic activities. It examines impacts observed as a result of these discharges, including the presence of hazardous materials and eutrophication, and elucidates the remediation techniques developed to restore the health of sediments and how to evaluate the remediation technologies using indicators. The text explores the problems inherent in dealing with contaminated sediments in rivers, lakes, and estuaries and includes numerous case studies that illustrate key concepts. The authors provide wide-ranging coverage of the topic and include methods for evaluating the effectiveness of different remediation technologies. They make the case for the development and application of innovative management practices that create long-term solutions to sediment contamination to reduce natural resource depletion, continued landfill contamination, and diminished biodiversity in the aquatic geoenvironment.

Electrochemical Remediation Technologies for Polluted Soils, Sediments and Groundwater

This book demonstrates the benefits of using commercially available surfactants, or surface-active agents, for remediation of metal-contaminated soil and sediment. First the book offers theoretical reviews of commercially available surfactants, then it proceeds to a study of various available surfactants for the mobilization of metals. Surfactants representative of amphiphiles discovered in the digestive environment of sediment-ingesting organisms are used to examine the extent and rate of metal (Al, Fe, Cd, Cu, Mn, Ni, Pb, Sn, Zn) mobilization from contaminated estuarine sediment. Metals can cause harmful effects to the environment and organisms. It is difficult to treat contaminants that are often tightly bound to the extremely small size of the estuarine sediments. The book also demonstrates the mechanisms of metal mobilization that appear to be related to complexation with monomers and adsorption to micelles of the anionic amphiphiles, and to the denudation of hydrophobic host phases or coatings on the sediment by micelles of both anionic and nonionic surfactants. Readers obtain a better understanding of current commercial surfactants, their impact on the environment, and possible remediation. This transdisciplinary book contributes toward Sustainable Development Goals numbers 6 (Clean Water and Sanitation) and 13 (Climate Action) set by the United Nations and is useful for students and teachers of sediment studies, coastal studies, environmental sciences, hydrology, civil engineering, and policy sciences.

Soil and Groundwater Remediation Technologies

Why do some contaminants remain in soils indefinitely? How much of a threat do they pose to human health or the environment? The need for effective and economic site decontamination arises daily. Geoenvironmental Engineering: Contaminated Soils, Pollutant Fate, and Mitigation discusses why soils remain contaminated, focusing on the development of the factors, properties, characteristics, and parameters of soils and individual contaminants. Subjects covered include the basic properties of soils affecting accumulation of contaminants, long-term retention of contaminants and their fate, including the development of intermediate products. The author emphasizes the factors, interactions, and mechanisms important in the bonding and partitioning process. He provides the groundwork for determining the fate of pollutants in soils and sediments and their mitigation. Geoenvironmental Engineering: Contaminated Soils, Pollutant Fate, and Mitigation focuses on why soils and sediments remain contaminated, not how they became contaminated in the first place. You will understand why specific contaminants remain in soils and sediments, how much of a threat they pose to human health and the environment, and what steps to take for mitigation. With this information you can determine the extent of the contamination of soils and sediments, how long they will remain a threat, and what methods to use for their remediation.

Soil Remediation and Rehabilitation

Advances in Remediation Techniques for Polluted Soils and Groundwater focuses on the thematic areas for assessment, mitigation, and management of polluted sites. This book covers advances in modelling approaches, including Machine Learning (ML)/ Artificial Intelligence (AI) applications; GIS and remote sensing; sensors; impacts of climate change on geogenic contaminants; and socio-economic impacts in the poor rural and urban areas, which are lacking in a more comprehensive manner in the previous titles. This book encompasses updated information as well as future directions for researchers working in the field of management and remediation of polluted sites. Introduces fate and transport of multi-pollutants under varying subsurface conditions Details underlying mechanisms of biodegradation and biodetoxification of geogenic, industrial and emerging pollutants Presents recent advances and challenges in assessment, water quality modeling, uncertainty, and water supply management Provides authoritative contributions on the diverse aspects of management and remediation from leading experts around the world

Sediments Contamination and Sustainable Remediation

Paul T. Kostecki, Associate Director, Northeast Regional Environment Public Health Center, School Of Public Health, University Of Massachusetts At Amherst, Received His Ph.D. From The School Of Natural Resources At The University Of Michigan In 1 980. He Has Been Involved With Human And Ecological Risk Assessment And Risk Management Research For The Last 12 Years. Dr. Kostecki Has Co-Authored And Co-Edited Over 50 Articles And 16 Books On Environmental Assessment And Cleanup Including: Remedial Technologies For Leaking Underground Storage Tanks, Soils Contaminated By Petroleum Products; Petroleum Contaminated Soils, Vols. 1 To 3: Hydrocarbon Contaminated Soils And Groundwater, Vols. 1 To 4; Hydrocarbon Contaminated Soils, Vols. 1 To 5; Principles And Practices For Diesel Contaminated Soils, Vols. 1 To 5; Sesoil In Environmental Fate And Risk Modeling, Contaminated Soils, Vol. 1 And Risk Assessment And Environmental Fate Methodologies.Dr. Kostecki Also Serves As Associate Editor For The Journal Of Soil Contamination, Chairman Of The Scientific Advisory Board For Soil And Groundwater Cleanup Magazine As Well As An Editorial Board Member For The Journal Of Human And Ecological Risk Assessment.In A Addition. Dr. Kostecki Serves As Executive Director For The Association For The Environmental Health Of Soils (Aehs) And Was The Scientific Advisor For The Workshop On Assessment And Remediation Of Oil Contaminated Soils Held In Kuwait 18-22 March 1995.Dr. Manaf Behbehani Obtained His B.S. In Biology From The University Of Akron, Usa (1969) And M.S. In Zoology From The Same University (1972). He Continued His Graduate Studies At The University Of New Hampshire Receiving Ph.D. In Marine Ecology And Invertebrates In 1978. Since Then, He Has Been Teaching Ecology And Marine Biology Courses At The Faculty Of Science, Kuwait University. From 1 982-1987, He Held The Post Of Marine Scientist At The Regional Organisation For The Protection Of The Marine Environment (Ropme) In Kuwait. Dr. Behbehani Has Worked On A Number Of Pioneering Research Projects, Namely To Study The Zooplankton Of Kuwaiti Waters And The Western Section Of The Arabian Gulf, And To Study The Distribution, Abundance And Taxonomy Of Marine Invertebrates Living In The Intertidal Zones Of Kuwait. He Has Published Several Scientific Articles And Has Served As External Examiner For Several Masters Thesis. From 1991-1995, Dr. Behbehani Was Vice-Dean For Planning And Laboratories At The Faculty Of Science, Kuwait University And Is Presently Chairman Of The National Biodiversity Committee, State Of Kuwait. He

Was The Chairman Of The Scientific Committee For The Workshop On Assessment And Remediation Of Oil Contaminated Soils, The Proceedings Of Which Are Published In This Book.

Commercial Surfactants for Remediation

Electrokinetic Remediation for Environmental Security and Sustainability Explore this comprehensive reference on the remediation of contaminated substrates, filled with cutting-edge research and practical case studies Electrokinetic Remediation for Environmental Security and Sustainability delivers a thorough review of electrokinetic remediation (EKR) for the treatment of inorganic and organic contaminants in contaminated substrates. The book highlights recent progress and developments in EKR in the areas of resource recovery, the removal of pollutants, and environmental remediation. It also discusses the use of EKR in conjunction with nanotechnology and phytoremediation. Throughout the book, case studies are presented that involve the field implementation of EKR technologies. The book also includes discussions of enhanced electrokinetic remediation of dredged co-contaminated sediments, solar-powered bioelectrokinetics for the mitigation of contaminated agricultural soil, advanced electro-fenton for remediation of organics, electrokinetic remediation for PPCPs in contaminated substrates, and the electrokinetic remediation of agrochemicals such as organochlorine compounds. Other topics include: A thorough introduction to the modelling of electrokinetic remediation An exploration of the electrokinetic recovery of tungsten and removal of arsenic from mining secondary resources An analysis of pharmaceutically active compounds in wastewater treatment plants with a discussion of electrochemical advanced oxidation as an on-site treatment A review of rare earth elements, including general concepts and recovery techniques, like electrodialytic extraction A treatment of hydrocarbon-contaminated soil in cold climate conditions Perfect for environmental engineers and scientists, geologists, chemical engineers, biochemical engineers, and scientists working with green technology, Electrokinetic Remediation for Environmental Security and Sustainability will also earn a place in the libraries of academic and industry researchers, engineers, regulators, and policy makers with an interest in the remediation of contaminated natural resources.

Remediation of Soils, Sediments and Sludges by Extraction with Organic Solvents

The number of hazardous waste sites across the United States has grown to approximately 217,000, with billions of cubic yards of soil, sediment, and groundwater plumes requiring remediation. Sites contaminated with recalcitrant contaminants or with complex hydrogeological features have proved to be a significant challenge to cleanup on every levelâ€"technologically, financially, legally, and sociopolitically. Like many federal agencies, the Navy is a responsible party with a large liability in hazardous waste sites. Environmental Cleanup at Navy Facilitites applies the concepts of adaptive management to complex, high-risk hazardous waste sites that are typical of the military, EPA, and other responsible parties. The report suggests ways to make forward progress at sites with recalcitrant contamination that have stalled prior to meeting cleanup goals. This encompasses more rigorous data collection and analysis, consideration of alternative treatment technologies, and comprehensive long-term stewardship.

Geoenvironmental Engineering

Soil contamination represents a serious environmental problem and requires an immediate action plan to be prepared for typical and emergent contaminants. This book provides an overview of some remediation technologies, both traditional and emergent, as well as case studies based on the contribution from academia and service providers. Several soil and groundwater remediation technologies such as electrokinetic remediation, biological treatments (including phytoremediation), and chemical remediation are presented. Innovative technologies such as nanoremediation and the application of life cycle assessment as a decision tool for soil remediation technologies are also considered in this book. This book serves as a reference source for soil remediation as it includes applications, technologies, and valuable tools that can help in decision making during remediation actions. It can be used by students, researchers, service providers, and industry practitioners.

Technology Alternatives for the Remediation of PCB-contaminated Soil and Sediment

This book discusses bioavailability concepts and methods, summarizing the current knowledge on bioavailability science, as well as possible pathways for integrating bioavailability into risk assessment and the regulation of organic chemicals. Divided into 5 parts, it begins with an overview of chemical distribution in soil and sediment, as well as the bioavailability and bioaccumulation of chemicals in

plants, soil, invertebrates and vertebrates (including humans). It then focuses on the impact of sorption processes and reviews bioavailability measurement methods. The closing chapters discuss the impact of bioavailability studies on chemical risk assessment, and highlights further research needs. Written by a multi-disciplinary team of authors, it is an essential resource for scientists in academia and industry, students, as well as for authorities.

Advances in Remediation Techniques for Polluted Soils and Groundwater

This book details the state-of-the art in early warning monitoring of anthropogenic pollution of soil and water. It is unique with regard to its complex, multidisciplinary, mechanistic approach. Top scientists establish links and strengthen weak connections between specific fields in biology, microbiology, chemistry, biochemistry, toxicology, sensoristics, soil science and hydrogeology.

Assessments And Remediation Of Oil Contaminated Soils

This title includes a number of Open Access chapters. Although adverse health effects of heavy metals have been known for a long time, exposure to heavy metals continues and is even increasing in some areas. Remediating heavy metal contaminated soils and water is necessary to reduce the associated health and ecological risks, make the land resource available for agricultural production, enhance food security, and scale down land tenure problems. This book discusses the causes and the environmental impact of heavy metal contamination. It then explores many exciting new methods of analysis and decontamination currently studied and applied in the field today.

Electrokinetic Remediation for Environmental Security and Sustainability

This book combines the results of current research with essential background material to provide complete, in-depth coverage of every aspect of in situ and ex situ bioremediation, as well as an extensive overview of the physical and chemical processes currently available for treating petroleum-contaminated soils. Critical information has been collected and assembled under one cover to provide a convenient reference for anyone who must contend with this worldwide problem. Remediation of Petroleum Contaminated Soils: Biological, Physical, and Chemical Processes describes how to optimize the biodegradation of petroleum hydrocarbons in soil-water systems. It reports on the susceptibility of various petroleum components to biodegradation by microorganisms, and considers all groups of microorganisms for their potential contributions. The book also deals with problem areas such as the transport of organisms, oxygen, or nutrients throughout the subsurface, as well as biodegradation of polynuclear aromatic hydrocarbons (PAHs) and nonaqueous phase liquids (NAPLs). In addition, the book presents a variety of methods for monitoring bioremediation. This reference discusses current soil remediation processes and includes many innovative approaches. It also investigates means of controlling volatile organic compounds (VOCs) and leachate, and addresses methods for collecting and treating these secondary waste streams. The expansive coverage of this book will furnish readers with a wide range of options for developing treatment strategies and for customizing procedures for specific requirements.

Environmental Cleanup at Navy Facilities

This book demonstrates the measurement, monitoring and mapping of environmental contaminants in soil & sediment, surface & groundwater and atmosphere. This book explores state-of-art techniques based on methodological and modeling in modern geospatial techniques specifically focusing on the recent trends in data mining techniques and robust modeling. It also presents modifications of and improvements to existing control technologies for remediation of environmental contaminants. In addition, it includes three separate sections on contaminants, risk assessment and remediation of different existing and emerging pollutants. It covers major topics such as: Radioactive Wastes, Solid and Hazardous Wastes, Heavy Metal Contaminants, Arsenic Contaminants, Microplastic Pollution, Microbiology of Soil and Sediments, Soil Salinity and Sodicity, Aquatic Ecotoxicity Assessment, Fluoride Contamination, Hydrochemistry, Geochemistry, Indoor Pollution and Human Health aspects. The content of this book will be of interest to researchers, professionals, and policymakers whose work involves environmental contaminants and related solutions.

Contaminated Soils, Sediments and Water

Developing Cleanup Standards for Contaminated Soil, Sediment, & Groundwater