

Title Contaminant Hydrogeology 2nd Edition

Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination
Applied Hydrogeology for Scientists and Engineers
Practical Design Calculations for Groundwater and Soil Remediation
Ground Water Contamination
Thermodynamics of Crystals
Hydrogeological Conceptual Site Models
Soil and Environmental Chemistry
Hydrology for Engineers, Geologists, and Environmental Professionals
Environmental and Pollution Science
Principles of Contaminant Hydrogeology
Remediation Engineering
Treatment Wetlands, Second Edition
Principles of Hydrogeology, Third Edition
Geochemical and Biogeochemical Reaction Modeling
Soil and Water Contamination
Groundwater Contamination
Groundwater Engineering
Applied Hydrogeology of Fractured Rocks
Environmental Geochemistry
Groundwater Science
Applied Groundwater Modeling
Practical Environmental Bioremediation
Applied Hydrogeology
Modeling Groundwater Flow and Contaminant Transport
Contaminants in the Subsurface
Encyclopedia of water Science
Freshwater Ecology
Drinking Water Quality
The Design, Performance, and Analysis of Slug Tests
Urban Watersheds
Contaminant Hydrogeology
Hydrogeology
Contaminant Hydrogeology
Physical and Chemical Hydrogeology
Groundwater Hydraulics and Pollutant Transport
Water Pollution Biology, Second Edition
Biodegradation and Bioremediation
Soil and Water Contamination, 2nd Edition
The Handbook of Groundwater Engineering
Applied Contaminant Transport Modeling

Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination

Self-contained treatment focuses on the solution of lattice-dynamics problems, calculations of total crystal potential, evaluation of thermodynamic functions. Only modest background in quantum mechanics, solid state physics required.

Applied Hydrogeology for Scientists and Engineers

This book provides a comprehensive overview of reaction processes in the Earth's crust and on its surface, both in the laboratory and in the field. A clear exposition of the underlying equations and calculation techniques is balanced by a large number of fully worked examples. The book uses The Geochemist's Workbench® modeling software, developed by the author and already installed at over 1000 universities and research facilities worldwide. Since publication of the first edition, the field of reaction modeling has continued to grow and find increasingly broad application. In particular, the description of microbial activity, surface chemistry, and redox chemistry within reaction models has become broader and more rigorous. These areas are covered in detail in this new edition, which was originally published in 2007. This text is written for graduate students and academic researchers in the fields of geochemistry, environmental engineering, contaminant hydrology, geomicrobiology, and numerical modeling.

Practical Design Calculations for Groundwater and Soil Remediation

This new edition adds several new chapters and is thoroughly updated to include data on new topics such as hydraulic fracturing, CO₂ sequestration, sustainable groundwater management, and more. Providing a complete treatment of the theory and practice of groundwater engineering, this new handbook also presents a current and detailed review of how to model the flow of water and the transport of contaminants both in the unsaturated and saturated zones, covers the protection of groundwater, and the remediation of contaminated groundwater.

Ground Water Contamination

Hydrology for Engineers, Geologists and Environmental Professionals presents the fundamental concepts of physical and contaminant hydrology in watersheds, rivers, lakes, soils, and aquifers in an easy and accessible manner to the environmental professional. Recent research developments in nonlinear hydrologic science and new meshless simulation methods are included in this edition: new solutions of nonlinear infiltration; modeling of regional groundwater flow in heterogeneous media, irregularly-shaped domains, transient problems, multiple pumping wells, and nonlinear flow; contaminant transport simulation under nonlinear decay, nonlinear sorption, and unsaturated-saturated zones contaminant propagation. This edition includes 124 solved examples, 187 proposed problems, 153 illustrations, 71 tables, 46 short computer programs, answers to problems, and extensive bibliography.

Thermodynamics of Crystals

Soil and Environmental Chemistry emphasizes the problem-solving skills students will need when they enter their chosen field. Combining valuable soil chemistry concepts into the “big picture” by discussing how other soil and environmental factors affect the soil chemical concepts being discussed makes the text relevant to today's soil science curriculums. This revised reprint provides edits to formulas, numbers, and text. - Use of computer modeling for water and soil chemistry provides students with the models used by practicing environmental chemists. - Examples and complex problems with worked solutions included throughout the text. - Examples based on real data provide exposure to the real problems and data students will face in their careers.

Hydrogeological Conceptual Site Models

Fully updated and expanded into two volumes, the new edition of Groundwater Contamination explains in a comprehensive way the sources for groundwater contamination, the regulations governing it, and the technologies for abating it. Volume 1

covers all major contaminants and explains the hydrology and data used to determine the extent of pollution. Volume 2 discusses aquifer management, including technologies to control and stabilize multiple influxes into the water table. Among the many new features of this edition are a full discussion of risk assessment, the preparation of groundwater protection plans, and references linking the text to over 2,300 water-related Web sites.

Soil and Environmental Chemistry

This textbook employs a technical and quantitative approach to explain subsurface hydrology and hydrogeology, and to offer a comprehensive overview of groundwater-related topics such as flow in porous media, aquifer characterization, contaminant description and transport, risk assessment, and groundwater remediation. It describes the characterization of subsurface flow of pristine and polluted water and provides readers with easily applicable tools for the design of water supply systems, drinking-water source protection, and remediation interventions. Specific applications range from groundwater exploitation as a drinking water supply to the remediation of contaminated aquifers, from the definition and safeguarding of drinking-water sources to the assessment of human health risks in connection with groundwater contamination events. The book represents an ideal learning resource for upper-undergraduate and graduate students of civil engineering, environmental engineering, and geology, as well as practitioners in the fields of water resource management and environmental protection who are interested in groundwater engineering and technical hydrogeology.

Hydrology for Engineers, Geologists, and Environmental Professionals

Completely revised and updated, Treatment Wetlands, Second Edition is still the most comprehensive resource available for the planning, design, and operation of wetland treatment systems. The book addresses the design, construction, and operation of wetlands for water pollution control. It presents the best current procedures for sizing these systems, and describing the intrinsic processes that combine to quantify performance. The Second Edition covers: New methods based on the latest research Wastewater characterization and regulatory framework analyses leading to detailed design and economics State-of-the-art procedures for analyzing hydraulics, hydrology, substrates and wetlands biogeochemistry Definition of performance expectations for traditional pollutants such as solids, oxygen demand, nutrients and pathogens, as well as for metals and a wide variety of individual organic and inorganic chemicals Discussion of methods of configuration, construction, and vegetation establishment and startup considerations Ancillary benefits of human use and wildlife habitat Specific examples of numerous applications Extensive reference base of current information The book provides a complete reference that includes: detailed information on wetland ecology, design for consistent performance, construction guidance and operational control through effective monitoring. Case histories of operational wetland treatment systems illustrate the variety of design approaches presented allowing you to tailor them to the needs of your wetlands

treatment projects. The sheer amount of information found in Treatment Wetlands, Second Edition makes it the resource you will turn to again and again.

Environmental and Pollution Science

The challenges facing groundwater scientists and engineers today demand expertise in a wide variety of disciplines—geology, hydraulics, geochemistry, geophysics, and biology. As the number of the subdisciplines has increased and as each has become more complex and quantitative, the problem of integrating their concepts and contributions into a coherent overall interpretation has become progressively more difficult. To an increasing degree transport simulation has emerged as an answer to this problem, and the transport model has become a vehicle for integrating the vast amount of field data from a variety of sources and for understanding the relationship of various physical, chemical, and biological processes. Applied Contaminant Transport Modeling is the first resource designed to provide coverage of the discipline's basic principles, including the theories behind solute transport in groundwater, common numerical techniques for solving transport equations, and step-by-step guidance on the development and use of field-scale modeling. The Second Edition incorporates recent advances in contaminant transport theory and simulation techniques, adding the following to the original text: -An expanded discussion of the role of aquifer heterogeneity in controlling solute transport -A new section on the dual-domain mass transfer approach as an alternative to the classical advection-dispersion model -Additional chemical processes and reactions in the discussion of reactive transport -A discussion of the TVD (total-variation-diminishing) approach to transport solution -An entirely new Part III containing two chapters on simulation of flow and transport under variable water density and under variable saturation, respectively, and a third chapter on the use of the simulation-optimization approach in remediation system design Applied Contaminant Transport Modeling, Second Edition remains the premier reference for practicing hydrogeologists, environmental scientists, engineers, and graduate students in the field. In 1998, in recognition of their work on the first edition, the authors were honored with the John Hem Excellence in Science and Engineering Award of the National Ground Water Association

Principles of Contaminant Hydrogeology

A synthesis of years of interdisciplinary research and practice, the second edition of this bestseller continues to serve as a primary resource for information on the assessment, remediation, and control of contamination on and below the ground surface. Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination: Assessment, Prevention, and Remediation, Second Edition includes important new developments in site characterization and soil and ground water remediation that have appeared since 1995. Presented in an easy-to-read style, this book serves as a comprehensive guide for conducting complex site investigations and identifying methods for effective soil and ground water cleanup.

Remediation engineers, ground water and soil scientists, regulatory personnel, researchers, and field investigators can access the latest data and summary tables to illustrate key advantages and disadvantages of various remediation methods.

Remediation Engineering

Understanding that the natural world beneath our feet is the point at which civilization meets the natural world is critical to the success of restoration and prevention efforts to reduce contaminant impacts and improve the global environment because of one simple fact - contaminants do not respect country borders. Contaminants often begin their destructive journey immediately after being released and can affect the entire planet if the release is in just the right amount, at just the right location, and at just the right time. Taking an interdisciplinary approach, *Urban Watersheds, Geology, Contamination, Environmental Regulations, and Sustainability, Second Edition* presents more than 30 years of research and professional practice on urban watersheds from the fields of environmental geology, geochemistry, risk analysis, hydrology, and urban planning. The geological characteristics of urbanized watersheds along with the physical and chemical properties of their common contaminants are integrated to assess risk factors for soil, groundwater, and air. This new edition continues to examine the urban environment and the geology beneath urban areas, evaluates the contamination that affects watersheds in urban regions, and addresses redevelopment strategies. Features of the Second Edition: Examines contaminants and the successes of environmental regulation worldwide and highlights the areas that need improvement Describes several advances in investigation techniques in urban regions that now provide a huge leap forward in data collection, resolution, and accuracy Explains the importance of understanding the geological and hydrogeologic environments of urban and developed regions Provides new and enhanced methods presented as a sustainability model for assessing risks to human health and the environment from negative human-induced contaminant impacts Includes a new chapter that surveys how environmental regulations have been successful or have failed at protecting the air, water, and land in urban areas Suitable for use as a textbook and as a professional practice reference, the book includes case studies on successful and unsuccessful approaches to contaminant remediation as well as practical methods for environmental risk assessment. PowerPoint® presentations of selected portions of the book are available with qualifying course adoption. Daniel T. Rogers is currently the Director of Environmental Affairs at Amsted Industries Inc. in Chicago, Illinois. His writings address environmental geology, hydrogeology, geologic vulnerability and mapping, contaminant fate and transport, urban geology, environmental site investigations, contaminant risk, brownfield redevelopment, and sustainability. He has taught geology and environmental chemistry at Eastern Michigan University and the University of Michigan.

Treatment Wetlands, Second Edition

Tremendous progress has been made in the field of remediation technologies since the second edition of *Contaminant*

Hydrogeology was published two decades ago, and its content is more important than ever. Recognizing the extensive advancement and research taking place around the world, the authors have embraced and worked from a larger global perspective. Boving and Kremer incorporate environmental innovation in studying and treating groundwater/soil contamination and the transport of those contaminants while building on Fetter's original foundational work. Thoroughly updated, expanded, and reorganized, the new edition presents a wealth of new material, including new discussions of emerging and potential contaminant sources and their characteristics like deep well injection, fracking fluids, and in situ leach mining. New sections cover BET and Polanyi adsorption potential theory, vapor transport theory, the introduction of the Capillary and Bond Numbers, the partitioning interwell tracer testing technique for investigating NAPL sites, aerial photographic interpretation, geophysics, immunological surveys, high resolution vertical sampling, flexible liner systems, groundwater tracers, and much more. Contaminant Hydrogeology is intended as a textbook in upper level courses in mass transport and contaminant hydrogeology, and remains a valuable resource for professionals in both the public and private sectors.

Principles of Hydrogeology, Third Edition

Alexander presents the basic principles of biodegradation and how these principles relate to bioremediation. All the subject's microbiological, chemical, toxicological, environmental, engineering and technological aspects are covered.

Geochemical and Biogeochemical Reaction Modeling

The slug test is currently the most common method for the in situ estimation of hydraulic conductivity at sites of suspected groundwater contamination. However, inappropriate procedures in one or more phases of a slug test can introduce considerable error into the resulting parameter estimates. This book remedies this problem by answering virtually every question regarding the design, performance, and analysis of slug tests. This is the first book to provide detailed information on the practical aspects of the methodology of slug tests. All major analysis methods are described in The Design, Performance, and Analysis of Slug Tests. Each analysis method is outlined in a step-by-step manner and illustrated with a field example. The major practical issues related to the field application of each technique are also discussed. This book will help the reader get more reliable parameter estimates from slug tests and increase the utility of slug test data.

Soil and Water Contamination

This text addresses the scientific and engineering aspects of subsurface contaminant transport, analysis, and modeling as well as remediation in ground water. It offers a modern engineering approach to ground water contamination problems of

the nineties and beyond.

Groundwater Contamination

At hundreds of thousands of commercial, industrial, and military sites across the country, subsurface materials including groundwater are contaminated with chemical waste. The last decade has seen growing interest in using aggressive source remediation technologies to remove contaminants from the subsurface, but there is limited understanding of (1) the effectiveness of these technologies and (2) the overall effect of mass removal on groundwater quality. This report reviews the suite of technologies available for source remediation and their ability to reach a variety of cleanup goals, from meeting regulatory standards for groundwater to reducing costs. The report proposes elements of a protocol for accomplishing source remediation that should enable project managers to decide whether and how to pursue source remediation at their sites.

Groundwater Engineering

Environmental Geochemistry: Site Characterization, Data Analysis and Case Histories, Second Edition, reviews the role of geochemistry in the environment and details state-of-the-art applications of these principles in the field, specifically in pollution and remediation situations. Chapters cover both philosophy and procedures, as well as applications, in an array of issues in environmental geochemistry including health problems related to environment pollution, waste disposal and data base management. This updated edition also includes illustrations of specific case histories of site characterization and remediation of brownfield sites. Covers numerous global case studies allowing readers to see principles in action Explores the environmental impacts on soils, water and air in terms of both inorganic and organic geochemistry Written by a well-respected author team, with over 100 years of experience combined Includes updated content on: urban geochemical mapping, chemical speciation, characterizing a brownfield site and the relationship between heavy metal distributions and cancer mortality

Applied Hydrogeology of Fractured Rocks

Hydrology is a topical and growing subject, as the earth's water resources become scarcer and more vulnerable. Although more than half the surface area of continents is covered with hard fractured rocks, there has until now been no single book available dealing specifically with fractured rock hydrogeology. This book deals comprehensively with the fundamental principles for understanding these rocks, as well as with exploration techniques and assessment. It also provides in-depth discussion of structural mapping, remote sensing, geophysical exploration, GIS, field hydraulic testing, groundwater quality

and contamination, geothermal reservoirs, and resources assessment and management. Hydrogeological aspects of various lithology groups, including crystalline rocks, volcanic rocks, carbonate rocks and clastic formations, are dealt with separately, using and discussing examples from all over the world. Applied Hydrogeology of Fractured Rocks will be an invaluable reference source for postgraduate students, researchers, exploration scientists, and engineers engaged in the field of groundwater development in fractured rock areas.

Environmental Geochemistry

This second edition is extensively revised throughout with expanded discussion of modeling fundamentals and coverage of advances in model calibration and uncertainty analysis that are revolutionizing the science of groundwater modeling. The text is intended for undergraduate and graduate level courses in applied groundwater modeling and as a comprehensive reference for environmental consultants and scientists/engineers in industry and governmental agencies. Explains how to formulate a conceptual model of a groundwater system and translate it into a numerical model Demonstrates how modeling concepts, including boundary conditions, are implemented in two groundwater flow codes-- MODFLOW (for finite differences) and FEFLOW (for finite elements) Discusses particle tracking methods and codes for flowpath analysis and advective transport of contaminants Summarizes parameter estimation and uncertainty analysis approaches using the code PEST to illustrate how concepts are implemented Discusses modeling ethics and preparation of the modeling report Includes Boxes that amplify and supplement topics covered in the text Each chapter presents lists of common modeling errors and problem sets that illustrate concepts

Groundwater Science

In many parts of the world, groundwater resources are under increasing threat from growing demands, wasteful use, and contamination. To face the challenge, good planning and management practices are needed. A key to the management of groundwater is the ability to model the movement of fluids and contaminants in the subsurface. The purpose of this book is to construct conceptual and mathematical models that can provide the information required for making decisions associated with the management of groundwater resources, and the remediation of contaminated aquifers. The basic approach of this book is to accurately describe the underlying physics of groundwater flow and solute transport in heterogeneous porous media, starting at the microscopic level, and to rigorously derive their mathematical representation at the macroscopic levels. The well-posed, macroscopic mathematical models are formulated for saturated, single phase flow, as well as for unsaturated and multiphase flow, and for the transport of single and multiple chemical species. Numerical models are presented and computer codes are reviewed, as tools for solving the models. The problem of seawater intrusion into coastal aquifers is examined and modeled. The issues of uncertainty in model input data and output

are addressed. The book concludes with a chapter on the management of groundwater resources. Although one of the main objectives of this book is to construct mathematical models, the amount of mathematics required is kept minimal.

Applied Groundwater Modeling

"This second edition of Remediation Engineering will continue to be the seminal handbook that regulators must have on-hand to address any of the remediation issues they are grappling with daily. The book is wide-ranging, but specific enough to address any environmental remediation challenge." —Patricia Reyes, Interstate Technology Regulatory Council, Washington, DC, USA "This book offers the researcher, teacher, practitioner, student, and regulator with state-of-the-art advances in conducting site investigations and remediation for common and emerging contaminants. It is revolutionary in its approach to conducting subsurface investigation, which greatly influences a successful and appropriate response in assessing and addressing environmental risk. This book is a giant leap forward in understanding how contaminants behave and how to reduce risk to acceptable levels in the natural world." —Daniel T. Rogers, Amsted Industries Incorporated, Chicago, Illinois, USA "This text is a superb reference and a good tool for learning about state-of-the-art techniques in remediation of soil and groundwater. [It] will become a ready reference at many companies as the engineering community creates increased value from remediation efforts around the world." —John Waites, AVX Corporation, Fountain Inn, South Carolina, USA Remediation Engineering was first published in 1996 and quickly became the go-to reference for a relatively young industry, offering the first comprehensive look at the state-of-the-science in treatment technologies of the time and the contaminants they applied to. This fully updated Second Edition will capture the fundamental advancements that have taken place during the last two decades within all the subdisciplines that form the foundation of the remediation engineering platform. It covers the entire spectrum of current technologies that are employed in the industry and also discusses future trends and how practitioners should anticipate and adapt to those needs. Features: Shares the latest paradigms in remediation design approach and contaminant hydrogeology Presents the landscape of new and emerging contaminants Details the current state of the practice for both conventional technologies, such as sparging and venting Examines newer technologies such as dynamic groundwater recirculation and injection-based remedies to address both organic and inorganic contaminants. Describes the advances in site characterization concepts such as smart investigations and digital conceptual site models. Includes all-new color photographs and figures.

Practical Environmental Bioremediation

Presents an examination of the scale of water pollution problems, and, through case studies, explores the type of investigations biologists need to undertake in solving them. The text draws comparisons between British and European practice,

Applied Hydrogeology

Freshwater Ecology, Second Edition, is a broad, up-to-date treatment of everything from the basic chemical and physical properties of water to advanced unifying concepts of the community ecology and ecosystem relationships as found in continental waters. With 40% new and expanded coverage, this text covers applied and basic aspects of limnology, now with more emphasis on wetlands and reservoirs than in the previous edition. It features 80 new and updated figures, including a section of color plates, and 500 new and updated references. The authors take a synthetic approach to ecological problems, teaching students how to handle the challenges faced by contemporary aquatic scientists. This text is designed for undergraduate students taking courses in Freshwater Ecology and Limnology; and introductory graduate students taking courses in Freshwater Ecology and Limnology. Expanded revision of Dodds' successful text. New boxed sections provide more advanced material within the introductory, modular format of the first edition. Basic scientific concepts and environmental applications featured throughout. Added coverage of climate change, ecosystem function, hypertrophic habitats and secondary production. Expanded coverage of physical limnology, groundwater and wetland habitats. Expanded coverage of the toxic effects of pharmaceuticals and endocrine disrupters as freshwater pollutants More on aquatic invertebrates, with more images and pictures of a broader range of organisms Expanded coverage of the functional roles of filterer feeding, scraping, and shredding organisms, and a new section on omnivores. Expanded appendix on standard statistical techniques. Supporting website with figures and tables - <http://www.elsevierdirect.com/companion.jsp?ISBN=9780123747242>

Modeling Groundwater Flow and Contaminant Transport

Bioremediation, or enhanced microbiological treatment, of environments contaminated with a variety of organic and inorganic compounds is one of the most effective innovative technologies to come around this century! Practical Environmental Bioremediation: The Field Guide presents updated material, case histories and many instructive illustrations to reflect the evolving image of this fast-emerging industry. Bioremediation technology has witnessed great strides towards simplifying treatability formats, finding new approaches to field application, more potent nutrient formulations, monitoring protocols and the resulting general improvement in results. This new guide condenses all current available knowledge and presents necessary technical aspects and concepts in language that can be readily comprehended by the technical student, experienced scientist or engineer, the aspiring newcomer, or anyone else interested in this exciting natural cleanup technique.

Contaminants in the Subsurface

Tremendous progress has been made in the field of remediation technologies since the second edition of Contaminant Hydrogeology was published two decades ago, and its content is more important than ever. Recognizing the extensive advancement and research taking place around the world, the authors have embraced and worked from a larger global perspective. Boving and Kremer incorporate environmental innovation in studying and treating groundwater/soil contamination and the transport of those contaminants while building on Fetter's original foundational work. Thoroughly updated, expanded, and reorganized, the new edition presents a wealth of new material, including new discussions of emerging and potential contaminant sources and their characteristics like deep well injection, fracking fluids, and in situ leach mining. New sections cover BET and Polanyi adsorption potential theory, vapor transport theory, the introduction of the Capillary and Bond Numbers, the partitioning interwell tracer testing technique for investigating NAPL sites, aerial photographic interpretation, geophysics, immunological surveys, high resolution vertical sampling, flexible liner systems, groundwater tracers, and much more. Contaminant Hydrogeology is intended as a textbook in upper level courses in mass transport and contaminant hydrogeology, and remains a valuable resource for professionals in both the public and private sectors.

Encyclopedia of water Science

Completely updated, the second edition of this comprehensive volume not only covers all major areas of hydrogeology, it takes a process-oriented, integrated approach so that readers can gain a complete understanding of the relationship between physical and chemical aspects of this subject. Provides a good balance between theory and application and includes new areas such as contaminant hydrogeology. Includes extensive reference list and suggested readings.

Freshwater Ecology

A reference for students, researchers, and environmental professionals, Hydrogeological Conceptual Site Models: Data Analysis and Visualization explains how to develop effective conceptual site models, perform advanced spatial data analysis, and generate informative graphics for applications in hydrogeology and groundwater remediation. Written by expert practitioners, this full-color book illustrates how fundamental hydrogeological concepts are translated into quantitative, high-resolution computer visualizations. In addition, the authors discuss topics not typically covered in conventional textbooks, including GIS technology and the relationship between conceptual site models and environmental policy. Advanced Methods for Data Analysis and Visualization Featuring more than 500 color illustrations, this unique and visually powerful book outlines the required elements of a conceptual site model and provides numerous examples of supporting charts, cross-sections, maps, and 3D graphics. The authors describe advanced analytical methods such as geospatial processing, kriging, and groundwater modeling through practical real-life examples. They also present numerous

case studies in groundwater supply and remediation to help explain key engineering design concepts. Data-Driven Assessments of Groundwater Management Policy The authors tackle controversial topics, ranging from technical impracticability of groundwater remediation to sustainable management of groundwater resources. They encourage discussion and independent thought about how current environmental policies and practices can evolve to achieve better outcomes at less cost to society. Practical Strategies for Communicating Your Findings to the General Public While the book is technical in nature, equations and advanced theory are kept to a minimum. The text focuses on practical strategies to help you create easy-to-understand data tables, graphs, maps, and illustrations for technical and nontechnical audiences alike. A companion DVD includes animations, reference material, modeling software, and more.

Drinking Water Quality

Principles of Hydrogeology, Third Edition presents important concepts of groundwater hydrology with a strong emphasis on problem-solving and field applications of hydrogeology. With newly added and revised content, this volume maintains a broad and current scope of topics, from the history of hydrogeology to the latest trends in managing groundwater contamination, arranged in the most compact and easy-to-use format available. Topics of interest include the role of groundwater in the hydrologic cycle; the nature of water-bearing formations; drilling boreholes and constructing monitoring wells; aquifers, well hydraulics, and aquifer tests; groundwater chemistry and flow; groundwater pollution, contaminant transport, remediation, and management. The author also provides the most current sources of hydrogeologic information, including professional societies, groundwater organizations, government agencies, industry publications, and Internet sites that provide data, software, techniques, protocols, standards, and training opportunities. Concise and informative, environmental regulators as well as groundwater and hydrology professionals will find Principles of Hydrogeology, Third Edition a handy and irreplaceable source for looking up definitions, tools, and equations while working on groundwater problems.

The Design, Performance, and Analysis of Slug Tests

Groundwater Science, Second Edition - winner of a 2014 Textbook Excellence Award (Texty) from The Text and Academic Authors Association - covers groundwater's role in the hydrologic cycle and in water supply, contamination, and construction issues. It is a valuable resource for students and instructors in the geosciences (with focuses in hydrology, hydrogeology, and environmental science), and as a reference work for professional researchers. This interdisciplinary text weaves important methods and applications from the disciplines of physics, chemistry, mathematics, geology, biology, and environmental science, introducing you to the mathematical modeling and contaminant flow of groundwater. New to the Second Edition: New chapter on subsurface heat flow and geothermal systems Expanded content on well construction and

design, surface water hydrology, groundwater/ surface water interaction, slug tests, pumping tests, and mounding analysis. Updated discussions of groundwater modeling, calibration, parameter estimation, and uncertainty Free software tools for slug test analysis, pumping test analysis, and aquifer modeling Lists of key terms and chapter contents at the start of each chapter Expanded end-of-chapter problems, including more conceptual questions Winner of a 2014 Texty Award from the Text and Academic Authors Association Features two-color figures Includes homework problems at the end of each chapter and worked examples throughout Provides a companion website with videos of field exploration and contaminant migration experiments, PDF files of USGS reports, and data files for homework problems Offers PowerPoint slides and solution manual for adopting faculty

Urban Watersheds

Soil and Water Contamination, Second Edition gives a structured overview of transport and fate processes of environmental contaminants. Dealing with all topics essential for understanding and predicting contaminant patterns in soil, groundwater and surface water, it contributes to the formation of a solid basis for adequate soil and water pollution control and integrated catchment management. A unique feature of this work is that it does not treat water and soil pollution as independent processes, but as components of an integrated whole. The core of this geoscientific approach is divided into four parts:

- Introduction to the basics of soil and water contamination, such as the fundamentals of environmental pollution and chemistry and the basic properties of soil, groundwater and surface water.
- Source, role, and behaviour of substances in soil and water, treating natural and anthropogenic sources of nutrients, heavy metals, radionuclides and organic pollutants as well as emerging substances of concern, their physico-chemical characteristics, behaviour, and toxicity.
- Transport and fate of substances in soil and water, focusing on processes of transport, exchange and transformations like advection, dispersion, adsorption kinetics and biochemical decay. Special attention is paid to the mathematical description and modelling of these processes.
- Patterns of substances in soil and water, explaining spatial and temporal patterns of pollutants in soil, groundwater, and surface water, illustrated by recent case studies from fundamental and applied research.

This comprehensive, successful textbook, now in its second edition, has been conscientiously updated and extended and includes many case studies, examples and exercises sections, providing undergraduate and graduate students in the Earth and Environmental Sciences with all the material necessary for the study of soil and water contamination. In addition, it can serve as a useful source of information for professionals.

Contaminant Hydrogeology

Soil and Water Contamination, Second Edition gives a structured overview of transport and fate processes of environmental contaminants. Providing a structured overview of transport and fate processes of environmental contaminants, this

textbook approaches the environmental issues of soil and water contamination from a spatial and earth science point of view. The new edition contains new material on pesticides and pharmaceutical contaminants and a greater number of exercises, case studies, and examples. It covers topics essential to understanding and predicting contaminant patterns in soil, groundwater, and surface water and contributes to the formation of a solid basis for adequate management and control of soil and water pollution and integrated catchment.

Hydrogeology

This second edition features new and expanded coverage of contaminant hydrogeologic investigations. It presents a practical approach to completing investigations for environmental compliance, emphasizing the use of geologic principles in assessment to move sites toward cleanup. Stressing the basics of collecting data that can withstand regulatory scrutiny and achieve remediation, *Principles of Contaminant Hydrogeology, Second Edition* demonstrates how to solve a client's site contamination problem while maximizing cost effectiveness. It focuses on small- and medium-sized firms, for which speed, accuracy, and cost are all crucial factors in the site assessment and closure process. Based on "real world" problems, the book takes you step-by-step through the investigation and includes client-consultant-regulator interaction, budgets, ethics, and data extrapolation for solving problems. It introduces concepts such as field logistics, drilling techniques, sampling protocols, contaminant movement, and remediation. Regulatory personnel, hydrogeological consultants, drilling contractors, remediation contractors, university instructors, and students will benefit from the wealth of information provided in this new edition.

Contaminant Hydrogeology

Hydrogeology's importance has grown to become an integral part not only of geology curricula, but also those in environmental science and engineering. Applied Hydrogeology serves all these students, presenting the subject's fundamental concepts in addition to its importance in other disciplines. Fetter skillfully addresses both physical and chemical hydrogeology, highlighting problem solving throughout the book. Case studies, Excel-based projects, and working student versions of software used by groundwater professionals supplement the fourth edition's insightful explanations and succinct solutions to real-world challenges. Each chapter concludes with example problems, a notation of symbols, and informative analysis. A glossary of hydrogeological terms adds significant value to this comprehensive text. Fetter's accessible coverage prepares readers for success in their careers well beyond the classroom.

Physical and Chemical Hydrogeology

Environmental and Pollution Science, Third Edition, continues its tradition on providing readers with the scientific basis to understand, manage, mitigate, and prevent pollution across the environment, be it air, land, or water. Pollution originates from a wide variety of sources, both natural and man-made, and occurs in a wide variety of forms including, biological, chemical, particulate or even energy, making a multivariate approach to assessment and mitigation essential for success. This third edition has been updated and revised to include topics that are critical to addressing pollution issues, from human-health impacts to environmental justice to developing sustainable solutions. Environmental and Pollution Science, Third Edition is designed to give readers the tools to be able to understand and implement multi-disciplinary approaches to help solve current and future environmental pollution problems. Emphasizes conceptual understanding of environmental systems and can be used by students and professionals from a diversity of backgrounds focusing on the environment. Covers many aspects critical to assessing and managing environmental pollution including characterization, risk assessment, regulation, transport and fate, and remediation or restoration. New topics to this edition include Ecosystems and Ecosystem Services, Pollution in the Global System, Human Health Impacts, the interrelation between Soil and Human Health, Environmental Justice and Community Engagement, and Sustainability and Sustainable Solutions. Includes color photos and diagrams, chapter questions and problems, and highlighted key words.

Groundwater Hydraulics and Pollutant Transport

This textbook provides a comprehensive review of the problems associated with the supply of drinking water in the developed world. Since the first edition of this book was published, water companies and regulators have been presented with numerous new challenges - global warming has seriously affected water supplies and water quality; advances in chemical and microbial analysis have revealed many new contaminants in water that were previously undetectable; and recent terrorist attacks have demonstrated how vulnerable water supplies are to contamination or disruption. This new edition includes an overview of the current and emerging problems, with potential solutions. It has been completely updated, and includes the WHO Revised Drinking Water Guidelines. An ideal textbook for courses in environmental science, hydrology, environmental health and environmental engineering; it also provides an authoritative reference for practitioners and professionals in the water supply industry.

Water Pollution Biology, Second Edition

In order to properly plan, design, and operate groundwater resources projects, it is necessary to measure - over time or distance - pertinent groundwater variables such as drawdown and discharge in the field. Applied Hydrogeology for Scientists and Engineers shows how to assess and interpret these data by subsurface geological setup and processing. The book helps readers estimate relevant groundwater parameters such as storativity, transmissivity, and leakage coefficient.

The text addresses many interrelated disciplines such as geology, hydrology, hydrogeology, engineering, petroleum geology, and water engineering. Traditional and current models for application are presented. One of the unique features of the book is the inclusion of new and previously unpublished ideas, concepts, techniques, approaches, and procedures developed by the author. Among these are hydrogeophysical concepts, slope matching techniques, volumetric approach solution for complicated groundwater flows, non-Darcian flow law applications, aquifer sample functions, dimensionless-type straight line methods, non-linear flow-type curves, discharge calculations from early time-drawdown data, storage coefficient estimation procedure for quasi-steady state flow, and much more. The pitfalls in aquifer test analysis are also detailed. Fractured medium flow adds yet another dimension to the book. Each method is supplemented by actual field data applications from worldwide case studies. Applied Hydrogeology for Scientists and Engineers covers the topics of groundwater reservoirs, the evaluation of aquifer parameters, aquifer and flow properties, flow properties and bore hole tests, aquifer tests in porous and fractured media, well hydraulics, groundwater flow and aquifer tests, and field measurements and their interpretations. This new reference also works well as a post-graduate textbook on the subject. Applied Hydrogeology for Scientists and Engineers expands the reader's knowledge by providing valuable information not found in any other publication.

Biodegradation and Bioremediation

Filled with figures, images, and illustrations, Encyclopedia of Water Science, Second Edition provides effective concepts and procedures in environmental water science and engineering. It unveils a wide spectrum of design concepts, methods, and solutions for enhanced performance of water quality, treatment, conservation, and irrigation methods, as well as improved water efficiency in industrial, municipal, and agricultural programs. The second edition also includes greatly enhanced coverage of streams and lakes as well as many regional case studies. An International Team Addresses Important Issues The only source to provide full coverage of current debates in the field, the encyclopedia offers professional expertise on vital issues including: Current laws and regulations Irrigation management Environmental water economics Agroforestry Erosion control Nutrient best management practices Water sanitation Stream and lake morphology and processes Sharpen Your Skills — Meet Challenges Well-Armed A direct and reliable source for best practices in water handling, preservation, and recovery, the encyclopedia examines challenges in the provision of safe water supplies, guiding environmental professionals as they face a worldwide demand for sanitary and affordable water reserves. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

Soil and Water Contamination, 2nd Edition

Hydrogeology: Principles and Practice provides a comprehensive introduction to the study of hydrogeology to enable the reader to appreciate the significance of groundwater in meeting current and future water resource challenges. This new edition has been thoroughly updated to reflect advances in the field since 2004. The book presents a systematic approach to understanding groundwater. Earlier chapters explain the fundamental physical and chemical principles of hydrogeology, and later chapters feature groundwater investigation techniques in the context of catchment processes, as well as chapters on groundwater quality and contaminant hydrogeology. Unique features of the book are chapters on the applications of environmental isotopes and noble gases in the interpretation of aquifer evolution, and on regional characteristics such as topography, compaction and variable fluid density in the explanation of geological processes affecting past, present and future groundwater flow regimes. The last chapter discusses groundwater resources and environmental management, and examines the role of groundwater in integrated river basin management, including an assessment of possible adaptation responses to the impacts of climate change. Throughout the text, boxes and a set of colour plates drawn from the authors' teaching and research experience are used to explain special topics and to illustrate international case studies ranging from transboundary aquifers and submarine groundwater discharge to the over-pressuring of groundwater in sedimentary basins. The appendices provide conversion tables and useful reference material, and include review questions and exercises, with answers, to help develop the reader's knowledge and problem-solving skills in hydrogeology. This accessible textbook is essential reading for undergraduate and graduate students primarily in earth sciences, environmental sciences and physical geography with an interest in hydrogeology or groundwater science. The book will also find use among practitioners in hydrogeology, soil science, civil engineering and planning who are involved in environmental and resource protection issues requiring an understanding of groundwater. Additional resources can be found at: <http://www.wiley.com/go/hiscock/hydrogeology>

The Handbook of Groundwater Engineering

Effective and enduring site restoration involves professionals from many branches of science and engineering. Geologists, hydrologists, chemists, microbiologists and meteorologists all play a part in remediation efforts—as do civil, chemical, mechanical and environmental engineers. When the time comes for all-important design calculations, that's where conflicts between disciplines become apparent. Due to certain differences in educational training, the ability of environmental professionals to perform or review design calculations varies. Bridge the gap with Practical Design Calculations for Groundwater and Soil Remediation. Jeff Kuo's hands-on experience as a consultant and teacher of soil/groundwater remediation informs this collection of the most practical and relevant working information. Written in a user-friendly, "cookbook-style" format, readers can promptly access the necessary information. More than 200 equations, coupled with

tables and figures, allow a clear understanding of purposes and procedures. To match the scope of Practical Design Calculations for Groundwater and Soil Remediation, you would have to comb through numerous publications. You may also be taking a chance on data that's already obsolete, due to rapid advancements in remediation technologies. One aspect doesn't change: basic, straightforward design calculation. Practical Design Calculations for Groundwater and Soil Remediation helps everyone involved in a site restoration project follow the same set of guidelines-for effective results.

Applied Contaminant Transport Modeling

This rigorous and comprehensive text provides fundamental information geared to students in either engineering or natural sciences courses dealing with groundwater. The first four chapters consider subsurface fluid flow, while the remaining twelve chapters cover subsurface contamination and pollutant transport. Charbeneau views the application of groundwater hydraulics and pollutant transport as a quantitative field. Although quantitative methods are exact, the fields of study are usually homogeneous; laboratory and field methods provide estimates for ideal (not real) fields. What impact does the use of ideal fields have on model predictions? The unknown answer places the study of subsurface flow of water and chemical mass transport in a prime position for continued research and this readily accessible text opens the door to that research. Outstanding features include: Comprehensive, rigorous, and highly accessible coverage Includes information on groundwater flow, well hydraulics, field methods for parameter estimation, hydrologic relationships between surface water and groundwater hydrology, mass transport of contaminants by advection, diffusion and dispersion, and special problems posed by nonaqueous phase liquids (oils). Strong focus on applications Empowers readers with knowledge and methodologies that they can use in real, day-to-day practices. Includes 66 worked examples and 178 problems integrated throughout. Examination of standard software being used in the industry today Exposes readers to the USGS MODFLOW model (the most widely used numerical simulation model for groundwater flow) and the USGS MOC3D. These models, together with a user interface (MFI), can be downloaded from the Internet.

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