



Groundwater Hydraulics And Pollutant Transport

By Randall J. Charbeneau

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Groundwater Hydraulics And Pollutant Transport By Randall J. Charbeneau

This rigorous and comprehensive text provides fundamental information geared to students in either engineering or natural sciences courses dealing with groundwater, including subsurface fluid flow, 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: 1) comprehensive, rigorous, and highly accessible coverage that 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); 2) strong focus on applications that empowers readers with knowledge and methodologies that they can use in real, day-to-day practices; 3) integrates 66 worked examples and 178 problems; 4) examines standard software being used in the industry today to expose the reader to the USGS MODFLOW model (the most widely used numerical simulation model for groundwater flow) and the USGS MOC3D.

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Editorial Review

From the Publisher

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From the Back Cover

FEATURES/BENEFITS

- **Comprehensive, rigorous and highly accessible coverage**—Offers well-structured and insightful discussions 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).
 - Enlightens and educates the reader on a wide range of practical interest areas involving today's engineers and scientists.
- **A sound foundation of introductory material to build upon**—i.e., introduces Darcy's law in a discussion based on fluid mechanics, then carefully connects all developments to basic principles (Ch. 2); relates multiphase partitioning relationships to simple phase relationships that students learned about in their introductory environmental engineering courses (Ch. 5).
 - Provides users with a solid base of fundamentals in all areas without becoming too abstract—giving the tools and intellectual confidence to progress to more difficult, related topics.
- **Strong focus on applications.**
 - Empowers the reader with knowledge and methodologies that they will be able to use in real, day-to-day practices.
- **A focus on significant and appropriate material**—Limits coverage to the essential principles and applications of groundwater hydraulics and pollutant transport—developing a smaller amount of important subjects in more detail.
 - Giving a targeted and well-balanced study of key topics, without repeating significant amounts of material that is commonly presented in other related areas.
- **66 worked examples and 178 problems integrated throughout.**
 - Gives ample opportunity to practice applying the concepts learned.
- **Introduction of novel computational tools**—Demonstrates the use of spreadsheets with; analysis of pumping test data (Ch. 3); evaluation of water balance from a rainfall event (Ch. 4); and evaluation of hydrocarbon distributions and free-product recovery systems.
 - Shows unique and new spreadsheets that can be used to solve problems of practical interest; spreadsheet examples can be downloaded from the Internet.
- **An examination of standard software being used in the industry today**—Discusses the USGS MODFLOW model (Ch. 2), and examines the USGS MOC3D model for solute transport (Ch. 8).
 - Exposes the user to software programs they will use in practice; and models can be downloaded from the Internet.

Users Review

From reader reviews:

Francis Garcia:

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