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Nota di contenuto	Fundamentals of Environmental Sampling and Analysis; Contents; Preface; ACKNOWLEDGMENTS; ABOUT THE AUTHOR; 1. Introduction to Environmental Data Acquisition; 1.1 Introduction; 1.1.1 Importance of Scientifically Reliable and Legally Defensible Data; 1.1.2 Sampling Error vs. Analytical Error During Data Acquisition; 1.2 Environmental Sampling; 1.2.1 Scope of Environmental Sampling; 1.2.2 Where, When, What, How, and How Many; 1.3 Environmental Analysis; 1.3.1 Uniqueness of Modern Environmental Analysis; 1.3.2 Classical and Modern Analytical and Monitoring Techniques; References Questions and Problems2. Basics of Environmental Sampling and Analysis; 2.1 Essential Analytical and Organic Chemistry; 2.1.1 Concentration Units; 2.1.2 Common Organic Pollutants and Their Properties; 2.1.3 Analytical Precision, Accuracy, and Recovery; 2.1.4 Detection Limit and Quantitation Limit; 2.1.5 Standard Calibration Curve; 2.2 Essential Environmental Statistics; 2.2.1 Measurements of Central Tendency and Dispersion; 2.2.2 Understanding Probability Distributions; 2.2.3 Type I and II Errors: False Positive and False Negative; 2.2.4 Detection of Outliers; 2.2.5 Analysis of Censored Data 2.2.6 Analysis of Spatial and Time Series Data2.3 Essential Hydrology

and Geology; 2.3.1 Stream Water Flow and Measurement; 2.3.2 Groundwater Flow in Aquifers; 2.3.3 Groundwater Wells; 2.4 Essential Knowledge of Environmental Regulations; 2.4.1 Major Regulations Administrated by the U.S. EPA; 2.4.2 Other Important Environmental Regulations; References; Questions and Problems; 3. Environmental Sampling Design; 3.1 Planning and Sampling Protocols; 3.1.1 Data Quality Objectives; 3.1.2 Basic Considerations of Sampling Plan; 3.2 Sampling Environmental Population
3.2.1 Where (Space) and When (Time) to Sample3.2.2 Obtain Representative Samples from Various Matrices; 3.3 Environmental Sampling Approaches: Where and When; 3.3.1 Judgmental Sampling; 3.3.2 Simple Random Sampling; 3.3.3 Stratified Random Sampling; 3.3.4 Systematic Sampling; 3.3.5 Other Sampling Designs; 3.4 Estimating Sample Numbers: How Many Samples are Required; References; Questions and Problems; 4. Environmental Sampling Techniques; 4.1 General Guidelines of Environmental Sampling Techniques; 4.1.1 Sequence of Sampling Matrices and Analytes; 4.1.2 Sample Amount
4.1.3 Sample Preservation and Storage4.1.4 Selection of Sample Containers; 4.1.5 Selection of Sampling Equipment; 4.2 Techniques for Sampling Various Media: Practical Approaches and Tips; 4.2.1 Surface Water and Wastewater Sampling; 4.2.2 Groundwater Sampling; 4.2.3 Soil and Sediment Sampling; 4.2.4 Hazardous Waste Sampling; 4.2.5 Biological Sampling; 4.2.6 Air and Stack Emission Sampling; References; Questions and Problems; 5. Methodology and Quality Assurance/Quality Control of Environmental Analysis; 5.1 Overview on Standard Methodologies
5.1.1 The U.S. EPA Methods for Air, Water, Wastewater, and Hazardous Waste

Sommario/riassunto

An integrated approach to understanding the principles of sampling, chemical analysis, and instrumentation This unique reference focuses on the overall framework and why various methodologies are used in environmental sampling and analysis. An understanding of the underlying theories and principles empowers environmental professionals to select and adapt the proper sampling and analytical protocols for specific contaminants as well as for specific project applications. Covering both field sampling and laboratory analysis, Fundamentals of Environmental Sampling and Analysis</