PREFACE AND OVERVIEW

PURPOSE OF THE MANUAL

Test Methods for Evaluating Solid Waste (SW-846) provides a unified, up-to-date source of information on sampling and analysis related to compliance with RCRA regulations. It brings together into one reference all sampling and testing methodologies approved by the Office of Solid Waste for use in implementing the RCRA regulatory program. The manual provides methodologies for collecting and testing representative samples of waste and other materials to be monitored. Aspects of sampling and testing in SW-846 include quality control, sampling plan development and implementation, analysis of inorganic and organic constituents, the estimation of intrinsic physical properties, and the appraisal of waste characteristics.

The procedures described in this manual are meant to be comprehensive and detailed, coupled with the realization that the problems encountered in sampling and analytical situations require a certain amount of flexibility. The solutions to these problems will depend, in part, on the skill, training, and experience of the analyst. For some situations, it is possible to use this manual in rote fashion. In other situations, it will require a combination of technical abilities, using the manual as guidance rather than in a step-by-step, word-by-word fashion. Although this puts an extra burden on the user, it is unavoidable because of the variety of sampling and analytical conditions found with hazardous wastes.

ORGANIZATION AND FORMAT

This manual is divided into two volumes and thirteen chapters. Volume I focuses on laboratory activities and is divided into three sections: IA, IB, and IC. Volume IA deals with quality control procedures, selection of appropriate test methods, and analytical methods for inorganic species. Volume IB consists of methods for organic analytes. Volume IC includes a variety of test methods for miscellaneous analytes and properties, including for use in evaluating whether a waste exhibits certain hazardous waste characteristics. Volume II deals with sample acquisition and includes quality control, sampling plan design and implementation, and field sampling methods. Discussions regarding ground water monitoring, land treatment monitoring, and incineration are also included in Volume II.

Volume I begins with an overview of the quality control procedures that should be adhered to during application of the sampling and analysis methods. The quality control chapter (Chapter One) and the method chapters are interdependent. The analytical procedures cannot be used without a thorough understanding of the quality control requirements and the means to implement them. This understanding can be achieved only by reviewing Chapter One and the analytical methods together. It is expected that individual laboratories, using SW-846 as the reference source, will select appropriate methods and develop a standard operating procedure (SOP) to be followed by the laboratory. The SOP should incorporate the pertinent information from this manual adopted to the specific needs and circumstances of the individual laboratory as well as to the materials to be evaluated.

The method selection chapter (Chapter Two) presents a comprehensive discussion of the application of these methods to various matrices in the determination of groups of analytes or specific analytes. It aids the chemist in constructing the correct analytical method from the array of procedures which may cover the matrix/analyte/concentration combination of interests. The section discusses the objective of the testing program and its relationship to the choice of an analytical method. Flow charts and tables provide guidance in the selection of the correct analytical procedures to form the appropriate method.

The analytical methods are separated into distinct procedures describing specific, independent analytical operations. These include extraction, digestion, cleanup, and determination. This format allows linking of the various steps in the analysis according to the type of sample (e.g., water, soil, sludge, still

bottom); analytes(s) of interest, needed sensitivity, and available analytical instrumentation. However, Chapters Five (Miscellaneous) and Six (Properties) give complete methods which are not amenable to such segmentation to form discrete procedures. The introductory material at the beginning of Chapters Three (Inorganic Analytes) and Four (Organic Analytes) contains information on sample handling and preservation, safety, and sample preparation.

Part II, Characteristics, of Volume I describes the hazardous waste characteristics (Chapter Seven) and methods used to determine if the waste is hazardous because it exhibits a particular characteristic (Chapters Seven and Eight).

Volume II gives background information on statistical and nonstatistical aspects of sampling. It also presents practical sampling techniques appropriate for situations presenting a variety of physical conditions.

Information regarding the regulatory aspects of several monitoring categories is also found in Volume II. These categories include ground water monitoring (Chapter Eleven), land treatment (Chapter Twelve), and incineration (Chapter Thirteen). The purpose of this guidance is to orient the user to the analytical objective, and to assist in the development of data quality objectives, sampling plans, and SOPs.

Significant interferences, or other problems, may be encountered with certain samples. In these situations, the analyst is advised to contact the Methods Team (5307W), USEPA/OSW/EMRAD[1], 401 M St. SW, Washington, DC 20460 (703-308-8855) for assistance. The manual is intended to serve all those with a need to evaluate solid waste. Your comments, corrections, suggestions, and questions concerning any material contained in, or omitted from, this manual will be gratefully appreciated. Please direct your comments to the above address.

SW-846 METHOD NUMBERS

When published as a new method to SW-846, a method's number does not include a letter suffix. However, each time the method is revised and promulgated as part of an SW-846 update, it receives a new letter suffix, i.e, a suffix of "A" indicates revision one of that method, a suffix of "B" indicates revision two, etc. In order to properly document the SW-846 method used during analysis, the entire method number including the suffix letter designation must be identified by the analyst. In addition, a method reference found within the RCRA regulations and the text of SW-846 methods and chapters always refers to the latest promulgated revision of the method, even if the method number at those locations does not include the appropriate letter suffix.

[1] United States Environmental Protection Agency; Office of Solid Waste; Economic, Methods, and Risk Analysis Division