LANL Order Reference

U.S. ENVIRONMENTAL PROTECTION AGENCY

RCRA
SAMPLING PROCEDURES HANDBOOK

TO BE UTILIZED
IN CONJUNCTION WITH THE
SAMPLING PROCEDURES TRAINING PROGRAM
1998

PREPARED FOR

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I through IV) which may be used to support sample evaluation. The types of analyses used for each of these levels are summarized in Table 3-1. These analyses, although CERCLA specific, are presented for informational purposes. As of this time, the interfacing of RCRA and CERCLA has not considered this level of detail to be required for RCRA sampling activities. However, they will provide the RCRA inspector or field sampler with information on various analytical methodologies undertaken by CERCLA.

3.2.3 Establish Data Quality Objectives for Quality Assurance

The quality of data is determined by a number of factors. These include the analytical levels (discussed above), contaminants of concern, concentration levels, and required analytical detection limits. Although many contaminants may be found at a particular site, some contaminants are of more concern than others. These include ones that are toxic, mobile, persistent or present in large quantities. The levels of concern are concentration ranges set by health standards, and applicable or relevant and appropriate requirements (ARARs) to Federal and State regulations. These include drinking water standards (both primary and secondary), air and water quality standards, etc.. These criteria are often used to set action levels at the site. The analytical methods employed must have detection limits which fall below the level of concern.

The remaining portion of this section is taken directly from Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objectives Process, EPA QA/G-4, October 1993.

Each year approximately $5 billion is spent annually collecting environmental data for scientific research, regulatory decision making, and regulatory compliance. While these activities are necessary for effective environmental protection, it is the goal of EPA and the regulated community to minimize expenditures related to data collection

by eliminating unnecessary, duplicative, or overly precise data. at the same time, they would like to collect data of sufficient quantity and quality to support defensible decision making. The most efficient way to accomplish both of these goals is to begin by ascertaining the type, quality, and quantity of data necessary to address the problem before the study begins. To facilitate this determination, the Quality Assurance Management Staff (QAMS) of EPA has developed the Method for determining the type, quantity, and quality of data that will be sufficient and appropriate for the data's intended use. By using the DQO Process to plan environmental data collection efforts, EPA/State and contractor personnel can improve the effectiveness, efficiency, and defensibility of decisions in a resource-effective manner.

What are DQOs? DQOs are qualitative and quantitative statements derived from the outputs of each step of the DQO Process that:

- Clarify the study objective;
- Define the most appropriate type of data to collect;
- Determine the most appropriate conditions from which to collect the data; and
- Specify acceptable levels of decision errors that will be used as the basis for establishing the quantity and quality of data needed to support the decision.

The DQOs are then used to develop a scientific and resource-effective sampling design.

What is the DQO Process? The DQO Process is a series of planning steps based on the Scientific Method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application.

The DQO Process was developed by EPA to help Agency personnel avoid collecting data that are inconsequential to decision making. The Process allows the decision makers to define their data requirements and acceptable levels of decision errors during planning, <u>before</u> they collect data. Application of the DQO Process should result in data collection designs that will yield results of appropriate quality for defensible decision making.

The DQO Process consists of seven distinct steps, as shown in Figure 3-1. The DQO Process is also iterative; the outputs from one step may influence prior steps and cause them to be redefined. This will ultimately lead to a more efficient data collection design. Each of the

This section should also address how the data will be evaluated and utilized for an enforcement decision. In most cases, background samples will be required to compare with down range sampling areas, unless sampling is being conducted to make a regulatory decision regarding definition of a RCRA hazardous waste by characteristic tests or listing procedures.

4.3 Methods for Choosing Sample Locations and Media

This discussion should be included as part of the sampling strategy section of the sampling plan. The appropriate locations, numbers, media and type of samples to be taken at a particular site depend upon a variety of factors. These factors include: the objectives of the sampling event; the degree of accuracy desired; the spatial and temporal variability of the media to be sampled; and the cost of collecting and analyzing the samples. If the sampling is being conducted as a preliminary sampling visit (i.e., RFA Sampling Visit) a sufficient number of samples should be collected to meet the site objectives. This information will also assist in the development of a more detailed sampling plan for subsequent activities such as an RFI. Sampling for enforcement purposes will require many more samples, obtained from specific locations, to yield representative and enforceable results.

There are numerous types of sampling events which require very different approaches to achieve enforceable data, which is necessary for making regulatory decisions. Several sampling cases are presented below which may provide insight into details discussed in subsequent sections.

Case 1

For RFAs, the objective of sampling is specifically to define SWMUs which may be releasing hazardous wastes or constituents to the environment. Following is a discussion of a few of the methodologies that may be used for this purpose.

- If a SWMU was identified on historical aerial photographs, but was not visible during the site visit, it may be buried. Therefore, sampling locations for this SWMU should be selected from the aerial photographs. Horizontal and vertical profiles should be sampled in order to adequately identify the buried unit. The number of samples is a judgement call.

- If surface water drainage was identified emanating from a SWMU lagoon area during the site visit, and required

Preservative

Specific practice employed (e.g., addition of chemicals or refrigeration) to slow the degradation of the sample before analysis. Table 5-4 presents sample preservative required under the CLP program.

Holding times

The time limit for samples to be analyzed, before they are degraded by chemical, biological and physical changes. Table 5-4 presents holding times for analytes which can be analyzed under the CLP program.

Precision

A measure of the reproducability of measurements, usually reported as coefficient of variation, standard deviation, relative standard deviation or range. CLP criterion is + 20 percent for most water matrices.

5.4 Laboratories

5.4.1 Contract Laboratory Program: The Contract Laboratory Program is a nationwide network of contractor laboratories. It is widely used for procuring legally-defensible analytical data which is generated through the use of designated standard methods, quality assurance procedures, quality control criteria and strict reporting requirements. CLP requests are usually procured by the U.S. EPA Regional Sample Control Coordinator (Regions I through X) along with the CLP Sample Management Office (SMO). The analytical services currently provided under the CLP are referred to as Routine Analytical Services (RAS). The 'menu' of services provided under RAS for standard sample matrices such as groundwater, surface water and soils are listed in Table 5-5. SW-846 provides additional information on analytical methodologies.

Once a request has been made, SMO assigns a case number to the group of analyses. This number is used to track samples through the CLP and to maintain site confidentiality. There are specific requirements for the CLP such as sample amounts, container types, packaging and documentation.

The U.S. EPA Users Guide to the CLP, and the latest Statement of Work for CLP analysis should be consulted for specific information in addition to SW-846. Other information on sample documentation can be found in Section 7.5.3.

Table 5-5
Contract Laboratory Program Menu
Routine Analytical Services

- Standard Analysis for Organics, Inorganics & Dioxins
- Water and Soils
- Low & Medium Concentrations
- One-Week Leadtime

5.4.2 Other Laboratory Considerations: If CLP is not required, other state or commercial laboratories may be used. However, it is recommended that the following issues be considered when procuring their services:

- Ask for a statement of qualifications. The statement should list capabilities, personnel, instrumentation and facilities.
- Check to see if the laboratory has State or Federal certifications, or other references.
- Discuss methodologies, accuracy and precision, detection limits, turn around time, quality assurance programs, chain-of-custody procedures, quality control criteria, reporting requirements and actions to take with outliers, and controls to ensure that sample holding times are not exceeded. As a guidance, SW-846, test methods for evaluating solid wastes should be utilized at all times.
- Communicate frequently with the laboratory.
- Also, keep in mind that many laboratories have containers and preservatives available when services are purchased.

5.5 References

Contract laboratory Program, 1986, Statement of Work for Inorganic Analysis Multi-Media, Multi-Concentration, October 1986 revised

EPA, 1979, Publications on the Analysis of Spilled Hazardous and Toxic Chemicals and Petroleum Oils, 1979.

EPA, 1983, Methods for Chemical Analysis of Water and Wastes, March 1983.