

## **9.0 QUALITY ASSURANCE**

Quality assurance (QA) may be defined as the actions necessary to provide confidence that an item, process, or program meets or exceeds that user's requirements and expectations. The near-facility environmental monitoring QA program consists of procedures and guides to demonstrate that environmental monitoring techniques and analyses are performed within established limits of acceptance. This is documented in the *Near-Facility Environmental Monitoring Quality Assurance Project Plan* (McKinney 2002).

Written operating procedures are an integral part of near-facility environmental monitoring QA. Procedures for field operations are provided in an internal Federal Services manual entitled *Operational Environmental Monitoring* (DFSNW-OEM-001). This section briefly describes the essential components of the near-facility environmental monitoring QA program.

### **9.1 DOCUMENTATION**

Record keeping is a vital part of any environmental monitoring program. Maintenance of environmental data is important from a QA standpoint, from a regulatory standpoint, and for trend analyses and optimization of environmental monitoring procedures. Each phase of near-facility environmental monitoring is documented. This documentation includes environmental sample logbooks, quarterly reports, annual reports, and occurrence reports.

### **9.2 SAMPLE REPLICATION**

Replicate sampling and subsequent analyses are the primary means of assessing sample variability. Duplicate samples of air, water, soil, sediment, and vegetation are collected.

### **9.3 DATA ANALYSIS**

Environmental data are reviewed to determine compliance with applicable federal and company guides. The data are analyzed both graphically and by standard statistical tests to determine trends and impacts on the environment. Newly acquired data are compared with historical data and natural background levels. Routine environmental data are stored on both magnetic media (i.e., in a computer environment) and hard-copy printouts.

## **9.4 TRAINING**

To ensure quality and consistency in sample collection and handling, all personnel performing such work received formal training. All radiological control technicians are required to complete a certification program. In addition, those radiological control technicians assigned to environmental monitoring receive special classroom orientation and on-the-job training by experienced personnel. Federal Services Environmental Monitoring and Investigations personnel, in addition to their formal training received while obtaining professional degrees, have received training in courses taught through Washington State University, the Harvard School of Public Health, and various other institutions.

## **9.5 SAMPLE FREQUENCY**

1. Ambient air sample filters are collected biweekly.
2. Radiological surveys of roads are performed quarterly, bimonthly, or annually.
3. The TLDs are exchanged quarterly.
4. Radiological surveys of waste sites are performed quarterly, semiannually, or annually depending on the operating status, condition, and history of the site.
5. Soil, vegetation, and surface water samples are collected annually.

## **9.6 ANALYTICAL PROCEDURES**

Three laboratories provided routine analytical support to the near-facility environmental monitoring: PNNL, the WSCF, and the 222-S Analytical Laboratory. Samples are analyzed in accordance with prescribed procedures and quality control guides that are described briefly in the following paragraphs.

### **9.6.1 Pacific Northwest National Laboratory Radiation Standards and Engineering**

**9.6.1.1 Thermoluminescent Dosimeters.** External radiation levels are measured using TLDs. The Hanford Site uses the Harshaw 8807 dosimeter and the Harshaw 8800 reader. The TLDs are calibrated, packaged, and read by the PNNL Radiation Calibration Laboratory, Radiation Standards and Engineering Department. All TLD work is performed in accordance with formal, written procedures.

### **9.6.2 222-S, Severn Trent Laboratories, and Waste Sampling and Characterization Facility Analytical Laboratories**

The 222-S and WSCF laboratories also provide analytical support to near-facility environmental monitoring. The WSCF is used for the samples containing typical environmental levels of radioactivity. The 222-S Laboratory is normally used for samples containing higher than normal environmental levels of radioactivity. Severn Trent Laboratories was used to perform special analysis for tritium in vegetation samples. Formal, written laboratory procedures are used in analyzing samples.

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