

Activity: **Radiological Environmental Monitoring**

1.0 Purpose: This guideline provides a method for evaluating a site's practices for radiological environmental monitoring.

2.0 Scope: This guideline has been developed for use in the review and evaluation of the following:

- E Administrative controls
- E Compliance with environmental technical specification surveillance requirements
- E Compliance with Offsite Dose Calculation Manual (ODCM) requirements
- E Environmental sample collection and analysis
- E Record retrievability.

3.0 References:

- 3.1 Site Radiation Protection Plan (RPP)
- 3.2 Unit specific Technical Specifications
- 3.3 Site specific ODCMs (Offsite Dose Calculation Manual)
- 3.4 NRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment"
- 3.5 NRC Inspection Procedure 80210, "Environmental Protection - Initial and Periodic Inspections"

4.0 Guidelines:

4.1 In preparation for and during the conduct of this surveillance:

- E Obtain and review implementing procedures, instructions and drawings governing this activity.
- E Prepare a guide or checklist using the selected items from this guideline.
- E Review past surveys, audits, surveillances and other evaluations/assessments.
- E Ensure that checklists include, where applicable, actual observations of performance, general plant conditions, radiological work practices, housekeeping, work document controls and use, and safety practices.

NOTE: Refer to Guideline A.1, "General Quality Surveillance Guidance," for specific details on the attributes listed above.

4.2 Determine the schedule for the collection of the environmental samples as specified in the unit's technical specifications/ODCM such as:

- A. Particulates and radioiodine
- B. Soil
- C. Direct radiation
- D. Water (surface, ground, and drinking)
- E. River sediment
- F. Mile
- G. Fish/Wildlife

H. Fruits and vegetables

I. Vegetation (pasturage and grass)

4.3 From the schedule, select one or more sample collection activities and observe the following at the sample collection site:

A. Sample collection and media changeout (e.g., dosimeters, filters, cartridges) are in accordance with written procedures, including methodology and location.

B. Sample and sample container are labeled for tracking purposes.

C. Sample integrity (e.g., prevention of cross contamination with other samples, sample activity loss) is maintained during and after sample collection.

D. Individuals collecting the sample appear knowledgeable in the activity.

E. If the activity is performed at a fixed monitoring station, observe the following:

1) Location is the same as specified in the unit's technical specifications/ODCM.

2) Equipment is the same as specified in the unit's technical specifications/ODCM.

3) Equipment appears well maintained, is calibrated and is operating correctly (e.g., air samplers, automatic water samplers).

4) Tags, logs, and/or other mechanisms are used to clearly indicate inspection, test, and operability status of air and water samplers as required by procedures.

4.4 Follow collected sample to the laboratory and observe the following activities:

- A. Sample integrity (e.g., prevention of cross contamination with other samples, sample activity loss) is maintained in transit up to time of analysis.
- B. The following records are generated in the laboratory and permit tracking of the sample:
 - 1) Sample collection method description.
 - 2) Sample description.
 - 3) Sample receipt and laboratory identification coding.
 - 4) Sample preparation and radiochemical processing (e.g., laboratory notebooks).
 - 5) Radioactivity measurements (counting) of samples, instrument backgrounds, and analytical blanks.
 - 6) Data reduction and verification.
- C. Standards used to calibrate laboratory counting equipment are traceable to that of the National Institute for Standards and Testing (NIST). When such standards are not available, standards should be obtained from a reputable source as defined in Regulatory Guide 4.15, Section C.6.1.
- D. Laboratory equipment, analysis methods, and written procedures provide for achieving Lower Limits of Detection (LLD) as specified in the unit's Technical Specifications/ODCM.

NUMBER: G.2

DATE: 8/89

- 4.5 Select one or more exposure pathways and/or types of samples (airborne, soil, direct, waterborne, aquatic, or ingestion). Review recent surveillance records and verify that environmental samples have been collected and analyzed in accordance with the technical specifications/ODCM (number of samples, sample locations, types of samples, sample collection frequencies, and types and frequencies of sample analyses), and that the results were returned within the time period requested.
- 4.6 Review recent surveillance records and verify compliance with technical specification surveillance requirements for the inter-laboratory comparison program as follows:
 - A. Verify that samples supplied have been analyzed and reported in accordance with the requirements of the program.
 - B. Compare the most recent annual radiological environmental report with the results in laboratory reports. Verify that previous results have been reported accurately in the annual radiological environmental report. If possible, perform this surveillance during the drafting of the current annual report.
 - C. Verify that the ODCM addresses analysis of samples supplied as part of the inter-laboratory analysis program.
- 4.7 Review surveillance records and verify compliance with technical specification surveillance requirements for the land use census as follows:
 - A. Compare the most recent annual radiological environmental report with the results of the previous annual land use census. Verify that the results of the census are

presented accurately in each of the sectors as specified by the Technical Specification/ODCM as follows:

- 1) Nearest milk animal
- 2) Nearest garden of greater than 500 square feet producing fresh leafy vegetables
- 3) Nearest residence

B. If any portion of the census is currently in progress, do the following:

- 1) Observe that the methodology used in the census (e.g., door-to-door survey, mail survey, telephone survey, aerial survey, or consulting local agricultural authorities) is thorough and can be expected to provide the best results of identifying the locations listed in the Technical Specification/ODCM.
- 2) Interview the individuals performing the census and discuss the associated with the environmental monitoring equipment and systems (e.g., air samplers, rainwater collectors, automatic water collectors).

D. Training/retraining records and documentation that individuals meet the qualification requirements for the activity performed.

5.0 Other Guidelines for Consideration:

5.1 A.1, "General Quality Surveillance Guidance"

NUMBER: G.2

DATE: 8/89

5.2 C.1, "Laboratory Practices"

5.3 G.1 "Radiological Effluent Monitoring"