

## APPENDIX E

### CALIBRATION OF RADIATION SURVEY INSTRUMENTS

Radiation survey instruments must be calibrated at least annually and after each maintenance or servicing of the instrument. The calibration should be sensitive enough to detect radiation emitted from the gauge sources and must meet all survey requirements identified in the Rules and Regulation for Control of Sources of Ionizing Radiation, Paragraph RH-1300. c, "Surveys". The survey instrument must be capable of measuring 1 to 50 millirem/hour.

- A. Calibration of survey instruments shall be performed using radioactive material (electronic calibration is not acceptable):
1. The calibration source activity or dose rates at specified distances shall be traceable to a standard certified to within  $\pm 5$  percent accuracy to a primary radiation standard such as those maintained by the U.S. National Institute for Standards and Technology (NIST).
  2. The calibration source shall approximate a point source.
  3. Each scale of the instrument shall be calibrated on at least two points located at approximately  $1/3$  and  $2/3$  of full scale.
  4. The dose rate measured by the instrument shall differ from the true dose rate by less than  $\pm 10$  percent at the two points on each scale. Readings within  $\pm 20$  percent will be considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret meter readings to within  $\pm 10$  percent for radiation protection purposes.
- B. Records of radiation survey instrument calibration shall be maintained on file for inspection purposes and shall be retained for at least 3 years following the date the record was created.
- C. Radiation survey instruments shall be checked for operability to verify the instrument is working properly. The operability check should be performed prior to use with a reference source, either a check source or the gauge itself. The readings from the reference source shall be obtained as soon as the instrument is received from the calibration service vendor. The readings shall be taken with the reference source placed in specific repeatable geometry relative to the instrument.

The operability check using the reference source should be taken:

1. Before each radiation survey to ensure that the instrument is operable, and
2. After each battery change, and
3. At least quarterly.

If any reading with the same geometry is not within 20 percent of the reading obtained immediately after calibration, the instrument should be recalibrated.

## Appendix E

### Form E

#### CALIBRATION OF RADIATION SURVEY INSTRUMENTS

Please provide the requested information by checking the appropriate items or completing the information in the space provided. The completed Form E is a commitment by the Applicant to perform the radiation survey instrument calibration as indicated.

#### RADIATION SURVEY INSTRUMENTS WILL BE CALIBRATED AS INDICATED

- \_\_\_\_\_ 1. Survey instruments will be calibrated at least annually and following each maintenance and repair activity.
- \_\_\_\_\_ 2. Calibration will be performed at two points on each scale used for radiation protection purposes.

The two points will be approximately 1/3 and 2/3 full scale. A survey instrument may be considered to be properly calibrated when the instrument readings are within  $\pm 10$  percent of the calculated or known values for each calibration point. Readings within  $\pm 20$  percent will be considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret meter readings to within  $\pm 10$  percent for radiation protection purposes. Also, when higher scales are not checked or calibrated, a precautionary note will be posted on the instrument.

3. Radiation survey instrument calibration will be performed by:

- \_\_\_\_\_ a. SERVICE VENDOR OR INSTRUMENT MANUFACTURER

Name of Company \_\_\_\_\_

Address of Company \_\_\_\_\_

Arkansas Vendor Registration Number \_\_\_\_\_

\_\_\_\_\_ b. **CONSULTANT**

Name of Company\_\_\_\_\_

Address of Company\_\_\_\_\_

Arkansas Vendor Registration Number\_\_\_\_\_

\_\_\_\_\_ c. **LICENSEE (Applicant)**

(1.) **Calibration Source**

**Radioactive Material**\_\_\_\_\_

**Activity (millicuries)**\_\_\_\_\_

**Manufacturer's Name**\_\_\_\_\_

**Source Model Number**\_\_\_\_\_

**Traceability to Primary Standard**\_\_\_\_\_

**Accuracy**\_\_\_\_\_

(2.) **Calibration procedures, including radiation safety procedures are attached.**

**YES**\_\_\_\_\_

**NO** \_\_\_\_\_ **(Explain)**\_\_\_\_\_