ENVIRONMENT, HEALTH & SAFETY
UNIVERSITY OF MICHIGAN

Conducting a Radioactive Contamination Survey Using a Survey Meter

Standard Operating Procedure

Revision Date: 05/29/18

Authorized users working with high energy beta particles, gamma emitting radionuclides, or both may choose to use an appropriate survey meter to survey for radioactive contamination rather than the swipe test technique.

Survey Meters

Due to the decreased counting efficiency, the sensitivity, or both, RSS **must** dictate a specific procedure for using survey meters. Use one of the following survey meters with the appropriate radionuclides:

TYPE OF SURVEY METER	USE WITH…
G-M survey meter Pancake/frisker probes	High-energy beta emitting radionuclides (P-32, Cl-36, Sr-90, Ra-223 etc)
Survey meters with low-energy Nal scintillation probes	Low-energy gamma emitting radionuclides (I-123, I-125, Th-232, U-238, etc)
Survey meters with standard 1" x 1" Nal scintillation probes	Medium- high-energy gamma (C-11, F-18, Na-22, Na-24, Co-58, Co-60, I-123, I-131, microsphere radionuclides, and other gamma emitting radionuclides)

Limitations using Survey Meters

Survey meters may only be used for high-energy beta (P-32, Cl-36, Sr-90, etc) and gamma emitting radionuclides (C-11, F-18, Na-22, Co-60, I-125, 1-131, Cs-137, microspheres, etc). Therefore, it is important to understand the relationship between the type and energy of radiation to be monitored and the selection of the appropriate survey meter.

G-M survey meters, for example, are incapable of detecting low energy H-3 contamination and are quite inefficient for detecting I-125 and low-energy beta emitting radionuclides such as C-14, S-35, and Ca-45. Also note that survey meters used in conjunction with beta-sensitive G-M (pancake/frisker or cylindrical) probes or gamma-sensitive Nal scintillation probes should be used for detection purposes only and not for measurement purposes unless calibrated specifically for the radionuclide to be monitored.

Radiation Safety Service's Responsibilities

RSS **must** conduct routine quarterly reviews of U-M laboratories. During the review, RSS will:

- Perform follow-up surveys
- Inspect survey records
- Discuss radiological safety protocols with research personnel

Authorized User's Responsibilities

Authorized users of unsealed radioactive material **must**:

- Conduct routine radioactive contamination surveys
- Document the results
- Maintain current records of these surveys for NRC and RSS inspections

Prior to Using a Survey Meter

Before using a survey meter, perform the appropriate operational checks:

- Check the survey meter for physical damage or abuse.
- Ensure the survey meter has been calibrated or checked for consistency within a designated calibration/check period (semi-annually or annually).
- Check the battery strength, and, if necessary, replace them.
- Ensure survey meter is zeroed properly.
- Ensure survey meter and probe respond consistently to a designated source (example, Coleman silk lantern mantle).
- Ensure the survey meter's audio component is on.

Recording the Results

Use the Radioactive Contamination Survey Record (RSS-105) form displayed below to record survey results and file the form in the Radiation Safety Records binder.

OCCUPATIONAL SAFETY & ENVIRONMENTAL HEALTH
RADIATION SAFETY SERVICE

RADIOACTIVE CONTAMINATION SURVEY RECORD

Authorized User _____ Building

Department _____ Room No. _____ Year

2.0 SURVEY RESULTS

SURVEY DATE	SURVEY TECHNIQUE CODE	SURVEY LOCATION	SURVEY RESULTS (GROSS CPM)	SURVEYED BY	CONDITIONS (IF TIME BKG)	CLEAN-UP EFFORT (COMMENTS)

Procedure: Conducting a Contamination Survey Using a Survey Meter:

1. Put on disposable gloves.
2. Place survey probe within one inch of the surface being monitored.
3. Survey a 5" x 5" area, holding the probe over the area for 1-3 seconds to enable the survey meter to respond effectively to the radioactive contamination.
4. Evaluate the survey results. If the results are:
   - ≤ 3 times background (statistically insignificant contamination level), no action is required and record as, "**No contamination**."
   - 3 times background, but ≤ 10 times background, confirm the results by resurveying the affected area and recounting.

- 10 times background, but ≤ 20 times background:
    1. Initiate decontamination effort immediately using hot/warm water, gritty or special decontamination detergent, and paper towel.
    2. Go to step 2.
- 20 times background, warn others, restrict access, label, and isolate the affected area. Contact RSS at (734) 764-6200 and refer to the procedure Preventing or Reducing the Dispersal of Radioactive Contamination Following a Spill.

5. Record the results of the survey on the Radioactive Contamination Survey Record form and file in the Radiation Safety Records binder. The gross count rate results should be recorded in one of the following units:
    - cpm
    - cps
    - dpm
    - dps