

RAM Survey Guidance

The following is an older memorandum but the information is still relevant. The [Contamination Survey Requirements](#) should be posted in the Laboratory.

April 19, 1999

MEMORANDUM

TO: Radioactive Material Permit Holders

FROM: Alfred M. Erdelji, Radiation Protection Facility

CC: Kenneth L. Mossman, Director, Radiation Protection Facility

SUBJECT: User Surveys for Surface Contamination

The ASU Radioactive Materials Manual requires that surveys for removable contamination be performed each day that unsealed sources of material are used. If several experiments are performed in one day, it is permissible to document only one survey. However, spot checks throughout the day are highly recommended. If an experiment takes several days to complete, a documented survey must be performed each day of the experiment in which the unsealed sources are used. The extent and type of survey performed depends on the isotope and quantity of material used. A table summarizing survey requirements for the most common isotopes used at ASU is included. Although most laboratories have a good understanding of the survey requirements, proper documentation seems to be a persistent problem. Attached is a sample Source Utilization Log which includes several sample entries. These examples are the most common situations that arise during routine operations and should clear up any misunderstanding regarding survey documentation.

Scenario A:

A procedure is performed in which 40 uCi of P-32 is used. At the completion of the experiment, the technician surveys the bench top, floor around the work area, floor around waste containers, refrigerator handle any other areas which may have become contaminated. The worker finds no contamination except for 500 cpm in a centrifuge, which is marked with a sticker stating the equipment is internally contaminated to a level of 500 cpm. Since this was the only reading above background, and the equipment was marked as internally contaminated, the technician fills out the log indicating that no contamination was found. The 500-cpm is low level contamination and the equipment was labeled, so no further action is required.

Scenario B:

Same as Scenario A, except while performing the survey the worker finds 50,000 cpm in the centrifuge and all other areas are <50 cpm. In this case, the contamination level in the equipment is much higher than expected, given the information on the equipment label indicating low level contamination (500 cpm). The technician cleans the centrifuge to level of 500 cpm, documents contamination was found, and that the equipment was decontaminated.

Scenario C:

The same technician finds 100,000 cpm on the work surface, 45,000 cpm on the beta shield, 4000 cpm on a pipette, 2000 cpm on the handle to the water bath, and several other areas. The worker obviously needs to improve his/her contamination control practices, but all is not lost. These levels are still easily controllable by laboratory personnel. Carefully clean all the areas, taking care not to cross contaminate clean areas, and then place all waste in the appropriate containers. When documenting the survey, summarize your findings. Indicate where the maximum levels were found, and that the area was decontaminated. We assume all the other areas were decontaminated as well.

Scenario D:

Same technician finds 500,000 cpm on the floor, 150,000 cpm on the refrigerator handle, 30,000 cpm on his/her shoe. There is a serious problem here. The contamination on the shoe and the high levels on the floor indicate contamination may have been spread to uncontrolled areas or other labs. The worker should stop and call the RPF immediately. Restrict access to the lab, and ensure that all workers in the affected and nearby labs remain clear of the spill, but in the general area to ensure the problem is not compounded by people vacating the premises. RPF personnel will respond to the lab and manage the scene. This is an extreme example, but RPF personnel are always available to assist in any situation that you may encounter.

The scenarios and examples of survey documentation described above are the most common used at ASU. Some labs may use a slightly different method to document surveys. This is acceptable if approved by the RPF and the conditions for documenting surveys stated in the RAM manual are met. The documentation must indicate whether contamination was or was not found, and must have the initials or signature of the person performing the survey. When using this alternate method of survey documentation, survey records must be retained by the lab, but the RPF Source Utilization Log should still be used to document the physical quantity of material used.

If you have any further comments or suggestion feel free to contact the RPF at 965-6140.

CONTAMINATION SURVEY REQUIREMENTS (POST IN LABORATORY)

Isotope	Quantity of material used in protocol (uCi)	Extent of Survey	Survey with G.M. Counter	Wipe Test Required
³² P	<10	Immediate work area, equipment, hands and feet of those handling the material	Y	N
³² P	>=10	Work area, hands and feet, floor around work area, table tops, refrigerator handles and any other area where there is a potential for spread of contamination.	Y	N
¹²⁵ I	< 1	Immediate work area, equipment,	Y	Y

		hands and feet of those handling the material.		
¹²⁵ I	>= 1	Work area, hands and feet, floor around work area, table tops, refrigerator handles and any other areas where there is a potential for spread of contamination.	Y	Y
³⁵ S	< 100	Immediate work area, equipment, hands and feet of those handling the material.	Y	Y
³⁵ S	>= 100	Work area, hands and feet, floor around work area, table tops, refrigerator handles and any other areas where there is a potential for spread of contamination.	Y	Y
¹⁴ C	< 1000	Immediate work area, equipment, hands and feet of those handling the material.	Y	Y
¹⁴ C	>= 1000	Work area, hands and feet, floor around work area, table tops, refrigerator handles and any other areas where there is a potential for spread of contamination.	Y	Y
³ H	<1000	Immediate work areas, equipment, hands and feet of those handling the material.	N	Y
³ H	>=1000	Work area, hands and feet floor around work area, table tops, refrigerator handles and any other areas where there is potential for spread of contamination.	N	Y

³²P and other "hard beta emitters": These nuclides are adequately detected with laboratory survey meters. The probe should be placed within a few millimeters of the surface, and moved very slowly. Surfaces with readings of more than 50 cpm above background should be decontaminated.

¹²⁵I, ³⁵S, ¹⁴C: G.M. counters with thin windows (1.2-2 mg/cm²) may be used for detecting areas of gross contamination. However, the efficiency of thin window G.M. detectors for these nuclides is such that contamination in excess of allowable limits may not be detected. A final check must be conducted using filter paper wipes as outlined for ³H.

³H: Wipe surfaces with filter paper and count by liquid scintillation or gamma counter for five minutes. If the count rate is more than 15 cpm above background, the surfaces should be decontaminated.

POLICY REGARDING ROUTINELY CONTAMINATED EQUIPMENT (LOW LEVEL)

Low level removable contamination levels **should not exceed 2500 cpm**. An attempt should be made to remove any contamination above background. However, if an item is routinely used, the guidelines outlined below may be utilized.

Instruments and glassware which are repeatedly used with radioactive materials may be stored in their contaminated condition if **contamination is low level**, they are bagged, marked with the radiation warning symbol, and placed in a closed container such as a drawer or cupboard which also shows the radiation warning symbol.

Interior surfaces of some equipment, such as centrifuges, may contain **low level contamination** if the equipment is properly marked and closed so those contaminated surfaces are not exposed to the room. Measurable contamination must not be allowed to remain on equipment and laboratory surfaces other than those listed above. Exceptions to this policy must be approved by the RSO.

Items mentioned above should be checked during the contamination survey to ensure contamination levels remain "low level". If an increase is noted, the item should be decontaminated in order to return loose contamination to a low level state

SOURCE UTILIZATION REPORT FORM

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