

## QCP6

### RADIOCHEMICAL CONTAMINATION CONTROL

#### 1.0 PURPOSE

To prevent radiological contamination of samples during analyses.

#### 2.0 RESPONSIBILITIES

##### 2.1 Laboratory Manager or designee

- Provide training/instruction of laboratory and counting room personnel in contamination control techniques and ensure that procedures are implemented.
- Develop procedures for samples requiring special handling.
- With the assistance of the ORISE Radiation Safety Officer (RSO), review procedures for high activity samples and recommend modifications/improvements as appropriate.

##### 2.2 Laboratory Staff

- Follow established procedures.
- Notify supervisors of suspected contamination incidents.

#### 3.0 PROCEDURE

3.1 Procedures for handling and processing samples in the ESSAP laboratory, to prevent cross contaminating other samples, will be determined on the basis of the contamination potential. This potential is primarily a factor of the activity level of the sample, but also may include consideration of the sample matrix and the analytical process. The following three categories of samples have been designated for the purpose of this procedure.

Low Activity (LA) -

- U-234/238, natural or processed - 150 pCi/g (soil/sediment) or 150 pCi/L (liquid)
- Th-228/232, natural or processed - 150 pCi/g (soil/sediment) or 150 pCi/L (liquid)

- Th-230, natural or processed - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
- Transuranics - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
- Strontium - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
- Tritium - 1000 pCi/g (soil/sediment) or 1000 pCi/L (liquid)
- Tc-99 - 200 pCi/g (soil/sediment) or 200 pCi/L (liquid)
- Gamma Emitters - 100 pCi/g (soil/sediment) or 100 pCi/L (liquid)
- Samples of small size, e.g., smears, are limited to 1000 pCi total activity, when the activity is dispersible (i.e., in other than a solid matrix) or the analysis entails other than strictly physical operations (weighing or direct counting).

Moderate Activity (MA) - Samples with activity levels between 1 and 100 times the limits for the Low Activity category.

High Activity (HA) - Samples containing greater than 100 times the Low Activity category limits.

- 3.2 Based on screening measurements or knowledge of site conditions, samples containing MA or HA levels are identified by the Laboratory Manager or designee from the Laboratory Work Request.
- 3.3 Samples which are MA or HA are segregated from the LA samples, for batching and analysis.
- 3.4 LA samples are processed following standard laboratory practices; these include:
  - Cleaning (detergent) of any equipment contacting the sample, prior to reuse
  - Arrangement of open containers to prevent dropping of material from one container into another during transfer
  - Use of fume hoods, where appropriate, for specific procedures
  - Disposal of non-cleanable supplies/equipment as suspect radioactive wastes
  - Routine daily radiation monitoring of work areas and monthly radiation surveys
  - Notification of supervision of any known or suspected work area contamination or sample cross-contamination

3.5 MA samples will be handled/processed separate from other categories. In addition to the practices specified in 3.4 for LA samples the following apply:

- Glassware will be cleaned thoroughly and surveyed after use to ensure that no detectable contamination remains. Glassware with no detectable contamination may be reused. Contaminated glassware is to be disposed to radioactive waste.
- Waste materials will be handled as radioactive waste.

3.6 HA samples will be processed separate from those in other categories. For any such samples a specific control procedure will be prepared by the laboratory, reviewed by the ORISE RSO. The procedure will include but will not be limited to, the following:

Processes to be performed and reasons  
Processing containment  
Training  
Personnel protection and monitoring  
Contaminated process equipment and materials  
Area radiation surveys  
Sample archival and/or disposal