

# SP1

## SAMPLE SCREENING AND RECEIPT

### 1.0 PURPOSE

The purpose of this procedure is to provide requirements for sample radiological screening and labeling of samples.

### 2.0 RESPONSIBILITIES

#### 2.1 Project Manager/Laboratory Manager

- Evaluate projects to identify those with the potential for having samples containing activity levels that may require special laboratory handling in accordance with the procedure, "Radiochemical Contamination Control", QCP6.
- Provide direction to sample collectors and those performing log-in as to screening and records requirements.
- Provide information on handling sample shipping containers that are too large to be opened in an exhaust hood. This information may be used to determine internal sample packaging configuration and potential contamination levels by contacting the sender. Use of hand-held radiation detectors during container opening may be used, as well.

#### 2.2 Field Survey Personnel

- Perform calibrations for the different type of hand-held screening detectors used for samples. Calibrations will be performed using the current procedure in the Survey Procedures Manual.
- Determine at collection time, those samples in categories requiring special handling and note on sample container and collection record form.
- Deliver samples to designated log-in/sample holding area.
- Assure chain-of-custody documentation is completed to transfer custody of samples to laboratory. (See QP Manual)

#### 2.3 Laboratory Personnel

- Receive and screen samples collected by IEAV and other organizations sent directly to the laboratory. Sample shipping containers are to be opened in an

exhaust hood when the hood can accommodate the size of the shipping container safely. When shipping containers are too large (e.g. 20-gallon drum) to be opened under the hood or present a lifting or other safety hazard, additional direction will be provided by the laboratory manager.

### 3.0 SAMPLE SCREENING

3.1 The following three categories of samples have been established for the purpose of controlling contamination in the laboratory during sample analysis. Within each category, the upper limits for certain isotopes are defined. These definitions are based on the frequency of analyses and the potential to cause contamination problems in the laboratory. Non-routine isotopes will be evaluated on a case by case basis.

- Low Activity (LA) – Samples with activity levels between 1 and 10 times the established background for the hand-held sample screening detector used.
- Moderate Activity (MA) - Samples with activity levels between 10 and 50 times the established background for the hand-held sample screening detector used.
- High Activity (HA) - Samples containing greater than the Moderate Activity category limits.

Certain contaminants (for example, very low energy, pure beta emitters, and pure alpha emitters in soil and water) will not be detectable using direct monitoring methods. Site history and other analytical data (if available) may be used as a basis for initially identifying samples as potentially containing contaminant levels requiring special laboratory handling. The conservatively estimated activity level should be assumed. Any such samples would, in addition to the activity category, be further identified as "Suspect".

3.2 Prior to collection of samples (or receipt of samples that are submitted directly to the laboratory by other organizations), the cognizant Project Manager or Field Team Leader will evaluate the potential that samples may contain activity levels in excess of the Low Activity category limits. If it is determined that such a potential does not exist, that evaluation is documented by a note to the project file, a notation in the project logbook, a statement in the project-specific plan, or other documentation in the permanent record.

If it is determined that there is a potential for receiving samples containing MA and/or HA levels, a plan for screening will be developed by Project Manager/Field Team Leader. The plan will identify:

- potential radionuclide contaminants which may exceed LA Levels;

- areas of the survey site from which samples may contain such levels;
- screening techniques (instruments, site history) to be used; and
- instrument response action levels (if appropriate) to be used for designating categories.

This information becomes part of the project file; project personnel will receive instruction in screening plan implementation.

- 3.3 At the time of collection by IEAV personnel, those samples containing other than LA levels (by virtue of field measurements, site history, or sample characteristics) will be identified. Warning labels, containing the designation MA or HA, will be affixed to the containers and a notation will be added to the sampling record form. Samples for which screening by direct monitoring is not applicable, but which are suspect for other reasons, will also include the wording "Suspect".
- 3.4 When samples are to be received from other collecting organizations, the IEAV Project Manager will request that the providing organization include information about anticipated activity levels and identify those specific samples suspected of containing MA and HA.

#### 4.0 SAMPLE RECEIPT

- 4.1 During sample log-in, samples received from other organizations will be monitored by direct measurement using hand-held screening detectors to determine the activity category. Hand-held detectors will be calibrated by the survey group personnel according to the Survey Projects Procedure Manual.

Personnel will perform detector operability check outs prior to sample screening. The detectors will be checked out by ensuring the calibration is current (calibration due date is listed on each combination), instrument high voltage is correct, and performing a battery check. After confirming the calibration is current, the high voltage is correct, and the battery check is within the analog meter acceptance range, perform a 1-minute background count and a 1-minute count of the check source. Record the date, time, background and source counts, and initials on the instrument operational check out form provided with each instrument/detector combination. Compare the detector background count rate and source check responses with the acceptance limits established for each detector and listed on the operational check out form. Instruments that do not meet the use parameters must not be used for sample screening and tagged "Out of Service" until repaired or re-calibrated.

## 4.2 Guidance for performing sample screening

- The information in section 3.1 will provide guidance as to the activity category levels. Samples which fall into the MA and HA category will be segregated and stored separately from LA samples. Samples which have not previously been identified as requiring special handling will be labeled. Categories and screening level data will be noted on the containers and in the laboratory database.
- Select the instrument which will provide the greatest sensitivity for the potential contaminant. The instrument must have a response and background check performed each day before use to ensure the instrument is in proper operating condition. The response check will also ensure that the instrument battery is in the prescribed operating range.
- Scan the sample to locate the point of maximum direct radiation. Determine the maximum direct contact radiation level and compare with the appropriate action levels for the sample category. Note the screening category on the sample label and in the sampling record form or sample logbook, as appropriate. The scan and measurement should be performed in a manner that provides an optimum condition for identifying activity, but prevents the possibility of contaminating instruments, personnel, and other samples. For example, soil samples may be monitored directly, while avoiding contact between the detector face and the sample.
- Where direct screening methods are not sufficiently sensitive to identify MA and HA categories, but the sample is suspected for other reasons of containing such levels, enter the notation "Suspect" on the sample label and in the LDB.
- In certain cases, other routine measurements may be sufficient to categorize a sample, without additional screening. Examples are: (1) where field surface activity measurements indicate a total activity level below the upper limit for LA Samples, screening of smears will not be necessary, and (2) when an in-situ soil contact gamma measurement indicates that a sampling location does not potentially contain elevated concentrations of gamma emitters, gamma screening of the sample will not be required.