Ludlum Model 2360 and 43-93 Probe Operational Checks and Use

Tank Farm Plant Operating Procedure

RADCON

Changes “Other Than Inconsequential” Require These Additional Reviews:

Radiological Controls:
Central Radcon Organization

USQ # GCX-2

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-7</td>
<td>11/08/2016</td>
<td>Radcon request</td>
<td>Updated Records section</td>
</tr>
<tr>
<td>D-6</td>
<td>09/01/2016</td>
<td>PER</td>
<td>Updated Records section to current standard.</td>
</tr>
<tr>
<td>D-5</td>
<td>08/18/2016</td>
<td>Inconsequential Change</td>
<td>Updated TFC-ESHQ-RP_MON-C-23 to TF-RC-043</td>
</tr>
<tr>
<td>D-4</td>
<td>06/23/2016</td>
<td>Inconsequential Change</td>
<td>Changed Record Section back to original at Radcon’s request</td>
</tr>
<tr>
<td>D-3</td>
<td>06/13/2016</td>
<td>Inconsequential Change</td>
<td>Changed Record Section to meet Standard</td>
</tr>
</tbody>
</table>

Table of Contents

Page
1.0  PURPOSE AND SCOPE  3
   1.1  Purpose.............................................................................................................. 3
   1.2  Scope.................................................................................................................... 3
2.0  INFORMATION............................................................................................................. 3
   2.1  General Information............................................................................................ 3
3.0  PRECAUTIONS AND LIMITATIONS................................................................................ 5
   3.1  Personnel Safety.................................................................................................. 5
   3.2  Equipment Safety.................................................................................................. 5
4.0  PREREQUISITES ........................................................................................................ 5
   4.1  Special Tools, Equipment, and Supplies.................................................................. 5
   4.2  Performance Documents......................................................................................... 5
5.0  PROCEDURE................................................................................................................ 6
   5.1  Operational Checks................................................................................................ 6

Type  Document No.  Rev/Mod  Release Date  Page
ROUTINE  TF-RC-031  D-7  11/08/2016  1 of 22
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 Initial Source Check</td>
<td>8</td>
</tr>
<tr>
<td>5.3 Daily Source Check</td>
<td>11</td>
</tr>
<tr>
<td>5.4 Scan and Static Count Survey Instructions</td>
<td>13</td>
</tr>
<tr>
<td>5.5 Sample/Smear/Surface Activity Determination Instructions</td>
<td>18</td>
</tr>
<tr>
<td>5.6 Records</td>
<td>22</td>
</tr>
</tbody>
</table>
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for the operation of the Ludlum Model 2360 Scaler/Ratemeter and the Ludlum Model 43-93 Alpha Beta Radiation Scintillation Detector probe.

1.2 Scope

This procedure applies to the Ludlum Model 2360 Scaler/Ratemeter with the Ludlum Model 43-93 Alpha Beta Scintillation Detector probe.

Specific information is provided for instrument use and performance of operational and source checks.

2.0 INFORMATION

2.1 Terms and Definitions

- MDA - Minimum Detectable Activity

2.1 General Information

2.1.1 Personnel using this instrument will be qualified in accordance with “Ludlum 2360 OJT with the 43-93 Scintillator Probe” (Course No. 356529).

2.1.2 The Ludlum 2360 count rate meter is a digital instrument capable of presenting data in scaler (digital display) mode, or rate meter (analog meter) mode. The rotary (pointer) switch engages a digital multiplier to display each range. Therefore, source checking the instrument on any single scale will validate all scales and all of the electrical circuits of the count rate meter.

2.1.3 A three-position toggle switch allows the selection of alpha, alpha-plus-beta, and beta for the digital and analog displays. Counting takes place simultaneously in the alpha and beta channels so that when counting in one mode or the other, the user need only switch to another mode to read the result. The alpha-plus-beta channel reads out the total counts or count rate for both channels.
2.1 General Information (Cont.)

2.1.4 When the three-position toggle switch is in the alpha position, the speaker generates “pops” for alpha events; when in the beta position, the speaker generates “clicks” for beta events. When the three-position toggle switch is in alpha-plus-beta position, the speaker generates both.

2.1.5 The instrument audio output can be adjusted using the volume control knob on the instrument face. Headphones can be used in high noise environments. The headphone jack is located on the instrument body.

2.1.6 The 2360 meter body and 43-93 probe are calibrated together. Calibration sticker dates and serial numbers on the meter body and probe indicate a mated set. Defective cables may be replaced (if like-for-like, including length) and the instrument reused without voiding calibration, if it passes source check prior to use.

2.1.7 A gray plastic skid frame is available for use during surveys. Use of the gray skid frame is optional. This skid frame provides a convenient mechanism for maintaining a consistent detector to surface distance during scan surveys.

2.1.8 A clear plastic probe cover is available for use when storing or transporting the instrument. Use of the cover is optional. The cover minimizes the potential of damage to the probe screen or mylar material. The cover will attenuate alpha and beta radiation and cannot be installed when performing measurements.

2.1.9 Beta to alpha cross talk is minimized during calibration and is inconsequential. Alpha to beta crosstalk is insignificant and inconsequential.

2.1.10 An instrument shall pass daily source check for both alpha and beta prior to use. If one channel has background response in the specific field work location that exceeds the allowable background level, but the background response in the other channel does not exceed the allowable background level, then the instrument may be used for measurement in the channel that does not exceed the allowable background level.

2.1.11 Additional information regarding theory of operation, calibration, maintenance, and instrument specifications and limitations, including environmental and interfering radiation, can be found in the Ludlum vendor manual for model 2360 Scaler/Ratemeter and 43-93 Alpha Scintillator and can also be obtained from the Calibration Service Provider.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - To prevent shock hazard, the instrument cable between the meter and the detector should not be disconnected unless the instrument has been off for at least one minute.

3.2 Equipment Safety

**CAUTION** - To prevent damaging the probe’s mylar window, use care not to touch the probe to small, sharp objects (e.g., pencil points, grass, tumbleweeds).

**CAUTION** - To prevent contaminating the probe, use care not to touch the probe to contaminated surfaces.

3.2.1 This instrument is suitable for both indoor and outdoor use and is to be used within the temperature range of -4 °F to 122 °F and a maximum relative humidity of less than 95%.

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Instrument requires two D-cell alkaline batteries
- $^{230}\text{Th}$ check source assembly (thorium-230)
- Testors® brand (or equivalent) silver paint
- Chemical gloves
- Mylar tape.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- BT-6002-880, Instrument Service Tag
- A-6002-895, Daily Instrument Source Check Log
- BL-6006-213, Daily Source Check
5.0 PROCEDURE

5.1 Operational Checks

NOTE - Steps within this section may be performed in any logical order as long as all steps are completed prior to instrument use.

Perform Checks for Physical Defects

5.1.1 IF installed REMOVE clear plastic cover and gray plastic skid frame.

5.1.2 INSPECT instrument for the following physical defects:
- Broken meter glass
- Loose knobs
- Punctured probe window
- Defective or damaged cables
- Any other observable defects that would affect operation.

**WARNING**
To prevent shock hazard, the instrument cable between the meter and the detector should not be disconnected unless the instrument has been off for at least one minute.

5.1.2.1 IF cable is defective or damaged, DEENERGIZE instrument.

a. REPLACE defective or damaged cable.

b. PRIOR to use PERFORM a daily source check per Section 5.3.

5.1.2.2 IF the instrument has defects requiring repair, TAG the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s).

a. SEGREGATE the instrument to prevent inadvertent use.

b. NOTIFY RadCon management.
5.1 Operational Checks (Cont.)

**Check Battery Condition**

5.1.3 **TURN** selector switch to "BAT" position **AND**

**CONFIRM** the meter reading is within "BAT OK" position on the meter face.

5.1.4 **IF** meter reading is not within "BAT OK" position on the meter face, **REPLACE** batteries.

5.1.4.1 **PRIOR** to use **PERFORM** a source check.

**Check Instrument for Light Leaks**

5.1.5 **TURN** selector switch to the X1 position **AND**

**ALLOW** a 10-second warm-up (minimum).

5.1.6 **ENSURE** the instrument is in the beta mode **AND**

**EXPOSE** the detector to the source of light at intended work location.

**NOTE** - Field repairs of up-to two screen segments (total) are allowed.

5.1.7 **IF** the instrument response is light sensitive, and attempted repair is desired and possible, **DETERMINE** leak location **AND**

**PERFORM** one of the following:

5.1.7.1 **IF** Testors® brand (or equivalent) silver paint will be used to repair light leak **DON** protective chemical gloves **AND**

**APPLY** paint.

5.1.7.2 **IF** mylar tape will be used to repair light leak **APPLY** tape.

5.1.8 **CHECK** that the instrument is no longer light sensitive.

5.1.8.1 **IF** the instrument has light leaks, **TAG** it with a completed instrument service tag (BT-6002-880) identifying the problem(s).

a. **SEGREGATE** the instrument to prevent inadvertent use.

b. **NOTIFY** RadCon management.
5.2 Initial Source Check

NOTE - The instrument is source checked using a $^{230}$Th (thorium-230) check source for both alpha and beta channels.

- The responses observed during an instrument's initial source check should be evaluated to determine if:
  • Net response is within the acceptable ranges printed on a calibrated source data sheet
  • Net response is within ±20% of the mean instrument response for that source (average of measured response for three to five instruments, A-6006-668)
  • In either case, the acceptable range should allow for variations that may be expected due to variations in probe efficiency (e.g., range expressed in units of dpm).

- Steps within this section may be performed in any logical order as long as all steps are completed.

5.2.1 - CHECK calibration status of the instrument.

5.2.1.1 IF calibration has expired, TAG the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s):

5.2.1.2 CONFIRM the sticker efficiency is:
  • $\geq 14\%$ $^{239}$Pu
  • $\geq 15\%$ $^{137}$Cs.
5.2 Initial Source Check

5.2.1.3 **IF** the efficiencies of 5.2.1.2 are not met, **THEN**

a. **SEGREGATE** the instrument to prevent inadvertent use.

b. **NOTIFY** RadCon management.

5.2.2 **PERFORM** operational checks in accordance with Section 5.1.

5.2.3 **DETERMINE** instrument background response.

5.2.3.1 **PERFORM** a one-minute background using the scaler mode.

5.2.3.2 **DETERMINE** alpha and beta background count rates (cpm) using scaler results.

5.2.3.3 **DOCUMENT** background count rates on Daily Instrument Source Check Log (A-6002-895).

5.2.3.4 **CONFIRM** background is \( \leq 3 \) cpm alpha and \( \leq 500 \) cpm beta.

5.2.3.5 **IF** background is > 3 cpm alpha or > 500 cpm beta, **TAG** the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s).

a. **SEGREGATE** the instrument to prevent inadvertent use.

b. **NOTIFY** RadCon management.

5.2.4 **PERFORM** an initial source count.

5.2.4.1 **PLACE** the detector over the check source in a reproducible geometry.

5.2.4.2 **IF** a source assembly is used, **DOCUMENT** assembly position used on the Daily Instrument Source Check Log (A-6002-895).

5.2.4.3 **PERFORM** a one-minute scaler source count.

5.2.4.4 **DETERMINE** the instrument's alpha and beta net responses using scaler results.

5.2.4.5 **DOCUMENT** alpha and the beta response (cpm) on A-6002-895.
5.2 Initial Source Check (Cont.)

5.2.5 EVALUATE initial source count response.

5.2.5.1 IF alpha and beta response is within ± 20% of the mean or typical instrument response for that source (3-5 instruments), or alpha and beta response is within ± 20% of source activity as determined for the source by a source calibration provider, ATTACH a Daily Source Check label (BL-6006-213) to the instrument AND COMPLETE the label.

5.2.5.2 IF alpha and beta response is not within ± 20% of the mean or typical instrument response for that source, or alpha and beta response is not within ± 20% of source activity as determined for the source by a source calibration provider,

a. SEGREGATE the instrument to prevent inadvertent use.

b. NOTIFY RadCon management.

c. TAG the instrument with a Blue Tag (BT-6002-880).

5.2.6 COMPLETE documentation.

5.2.6.1 MULTIPLY the instrument's alpha and beta net response by 0.8 and 1.2 to determine acceptable alpha and beta ranges for that instrument and source.

5.2.6.2 RECORD the acceptable range values on the Daily Instrument Source Check Log (A-6002-895).

5.2.6.3 COMPLETE the remainder of the Daily Instrument Source Check Log (A-6002-895).
5.3 Daily Source Check

5.3.1 **PERFORM** operational checks in accordance with section 5.1.

5.3.2 **EVALUATE** calibration status of the instrument.

5.3.2.1 **IF** calibration has expired, **TAG** the instrument with a completed instrument service tag (BT-6002-880) identifying the problem.

5.3.2.2 **CONFIRM** the sticker efficiency is:

- \( \geq 14\% \) \(^{239}\)Pu
- \( \geq 15\% \) \(^{137}\)Cs.

5.3.2.3 **IF** the efficiencies of 5.3.2.2 are not met, **PERFORM** the following:

a. **SEGREGATE** the instrument to prevent inadvertent use.

b. **NOTIFY** RadCon management.

5.3.3 **EVALUATE** instrument background response.

5.3.3.1 **PERFORM** a one-minute scaler background count.

5.3.3.2 **DETERMINE** alpha and beta background count rates (cpm) using scaler results.

5.3.3.3 **CHECK** background is \( \leq 3 \) cpm alpha and \( \leq 500 \) cpm beta.

5.3.3.4 **IF** background is \( > 3 \) cpm alpha or \( > 500 \) cpm beta, **TAG** the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s).

a. **SEGREGATE** the instrument to prevent inadvertent use.

b. **NOTIFY** RadCon management.

5.3.4 **EVALUATE** instrument daily source response.

5.3.4.1 **PLACE** the detector over the check source in the same geometry used for initial source check.
5.3 Daily Source Check (Cont.)

5.3.4.2 IF a source assembly is used, SELECT position used for initial source check.

5.3.4.3 PERFORM a one-minute scaler source count.

5.3.4.4 DETERMINE the instrument's alpha and beta net responses using scaler results AND

COMPARE the instrument's response to acceptable ranges on the Daily Instrument Source Check Log (A 6002-895).

5.3.5 COMPLETE documentation.

5.3.5.1 IF alpha and beta response is within the acceptable ranges on the Daily Instrument Source Check Log (A 6002-895), COMPLETE the Daily Source Check label (BL-6006-213) attached to the instrument AND

COMPLETE the remainder of the Daily Instrument Source Check Log (A 6002-895).

5.3.5.2 IF either alpha and/or beta response is not within the acceptable ranges on the Daily Instrument Source Check Log (A 6002-895), TAG the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s).

a. SEGREGATE the instrument to prevent inadvertent use.

b. NOTIFY RadCon management.
5.4 Scan and Static Count Survey Instructions

NOTE - Survey protocols for unconditional release of material and equipment are performed in accordance with TF-RC-043, Perform Release Surveys for Material and Equipment, or TFC-ESHQ-RP_MON-C-28, Release Surveys Plans.

General Requirements

5.4.1 EVALUATE calibration status of the instrument.

5.4.1.1 IF calibration has expired, TAG the instrument with a completed instrument service tag (BT-6002-880) identifying the problem.

5.4.1.2 CONFIRM the sticker efficiency is:
   • ≥ 14% $^{239}$Pu
   • ≥ 15% $^{137}$Cs.

5.4.1.3 IF the efficiencies of 5.4.1.2 are not met, PERFORM the following:
   a. SEGREGATE the instrument to prevent inadvertent use.
   b. NOTIFY RadCon management.

5.4.2 OBSERVE the Daily Source Check label (BL-6006-213) AND ENSURE daily checks are current.
5.4 **Scan and Static Count Survey Instructions (Cont.)**

5.4.3 **PRIOR** to intermittent use, and periodically during continuous use, **PERFORM** the following:

5.4.3.1 **PERFORM** operational checks of the instrument per Section 5.1 to check instrument operability.

5.4.3.2 **ENSURE** instrument and detector respond to radiation.

**NOTE** - A one-minute (or longer) scaler count may be necessary to verify a positive background response on the alpha channel.

5.4.3.3 **OBSERVE** instrument response to background radiation or other elevated sources of radiation,

**OR**

**PLACE** the detector over a check source.

5.4.4 **EVALUATE** background count rate at the work location.

5.4.4.1 **ENSURE** background is representative of the work location and the task to be performed.

5.4.4.2 **WHEN** either alpha or alpha plus beta surveys are performed **ENSURE** alpha background count rate is ≤ 3 cpm.

5.4.4.3 **WHEN** either beta or alpha plus beta surveys are performed **ENSURE** beta background count rate is ≤ 500 cpm.

5.4.5 **EVALUATE** surfaces being surveyed.

5.4.5.1 **WHEN** material release (clearance) surveys are performed, **ENSURE** surfaces are reasonably clean, dry, and relatively smooth.

5.4.5.2 **WHEN** non-release (non-clearance) surveys are performed and surfaces are not reasonably clean, dry, and relatively smooth, **RECORD** survey results as directed by work control/task instruction documents or RadCon Management.
5.4 Scan and Static Count Survey Instructions (Cont.)

Scan Surveys

5.4.6 DETERMINE scan/static (pause) survey parameters.

5.4.6.1 DETERMINE the following:
- Alpha and beta contamination limit(s) (or levels of concern) for the survey
- Confidence level required for the survey.

5.4.6.2 SELECT a scan speed and static (pause) count time that meets the required confidence level and has Minimum Detectable Activity (MDA) that is equal to or less than the contamination limits (or levels of concern).

CAUTION
To prevent damaging the probe’s mylar window, use care not to touch the probe to small, sharp objects (e.g., pencil points, grass, tumbleweeds).

CAUTION
To prevent contaminating the probe, use care not to touch the probe to contaminated surfaces.

5.4.7 PERFORM the scan survey at the selected scan speed and static (pause) count time.

5.4.7.1 MAINTAIN probe within ¼ inch of the surface.

5.4.7.2 SCAN the surface at the selected scan speed.
5.4 Scan and Static Count Survey Instructions (Cont.)

5.4.7.3 IF surveying for either alpha or alpha plus beta contamination and one or more audible alpha counts is heard, EVALUATE the suspect area for a period of time that is equal to or greater than the selected static (pause) survey count time.

a. IF no additional audible alpha count is heard, CONTINUE the survey.

NOTE - A single audible alpha count indicates contamination above background has been detected at the selected confidence level.

b. IF an additional audible alpha count is heard, GO TO Step 5.4.8.

5.4.7.4 IF surveying for either beta or alpha plus beta contamination and an increase in the audible beta count rate is heard/perceived, EVALUATE the suspect area for a period of time that is equal to or greater than the selected static (pause) survey count time.

a. IF no increase in the audible beta count rate is heard/perceived, CONTINUE the survey.

NOTE - A perceived increase in the audible beta count rate indicates contamination above background has been detected at the selected confidence level.

b. IF an increase in the audible beta count rate is heard/perceived, GO TO Step 5.4.8.

5.4.8 IF contamination above background has been detected AND the level of contamination is to be determined, GO TO Section 5.5.

Static Surveys

5.4.9 DETERMINE static survey count time using the appropriate survey methodology.

5.4.9.1 DETERMINE the following:

- Alpha and beta contamination limit(s) (or levels of concern) for the survey
- Confidence level required for the survey.
5.4 Scan and Static Count Survey Instructions (Cont.)

5.4.9.2 SELECT a static count time that meets the required confidence level and has MDA that is equal to or less than the contamination limits (or levels of concern).

5.4.10 PERFORM the static count survey at the selected static (pause) count time.

5.4.10.1 MAINTAIN the probe within ¼ inch of the surface or item being evaluated.

5.4.10.2 EVALUATE the suspect area for a period of time that is equal to or greater than the selected static (pause) survey count time.

5.4.10.3 WHEN surveying for either alpha or alpha plus beta contamination:

   a. IF no audible alpha count is heard, CONTINUE the survey.

   NOTE - A single audible alpha count indicates contamination above background has been detected at the selected confidence level.

   b. IF one or more audible alpha counts are heard, GO TO Step 5.4.11.

5.4.10.4 WHEN surveying for either beta or alpha plus beta contamination:

   a. IF no increase in the audible beta count rate is heard/perceived, CONTINUE the survey.

   NOTE - A perceived increase in the audible beta count rate indicates contamination above background has been detected at the selected confidence level.

   b. IF an increase in the audible beta count rate is heard/perceived GO TO Step 5.4.11.

5.4.11 IF contamination above background has been detected, and the level of contamination is to be determined, GO TO Section 5.5.
5.5 Sample/Smear/Surface Activity Determination Instructions

**General Requirements**

5.5.1 **OBSERVE** the Daily Source Check label (BL-6006-213) **AND**

**ENSURE** daily checks are current.

5.5.2 **PRIOR** to intermittent use and periodically during continuous use **PERFORM** the following:

5.5.2.1 **PERFORM** operational checks of the instrument per Section 5.1 to check instrument operability.

5.5.2.2 **ENSURE** instrument and detector respond to radiation.

**NOTE** - A one-minute (or longer) scaler count may be necessary to verify a positive background response on the alpha channel.

5.5.2.3 **OBSERVE** instrument response to background radiation or other elevated sources of radiation,

**OR**

**PLACE** the detector over a check source.

5.5.3 **EVALUATE** work locations being surveyed using Steps 5.5.4.1 and 5.5.4.2 of this procedure.
5.5 Sample/Smear/Surface Activity Determination Instructions (Cont.)

Using the Analog Meter

NOTE - Use of the analog meter for determining activity in dpm is appropriate when contamination levels are high enough to result in a readable instrument response. Low contamination levels, such as levels near release limits, particularly for alpha contamination, are not readily determined using analog meter results.

5.5.4 EVALUATE background count rate at the work location.

5.5.4.1 ENSURE background is representative of the work location and the task to be performed.

5.5.4.2 WHEN either alpha or alpha plus beta surveys are performed, ENSURE alpha background count rate is ≤ 3 cpm.

5.5.4.3 WHEN either beta or alpha plus beta surveys are performed, ENSURE beta background count rate is ≤ 500 cpm.

5.5.5 MAINTAIN the probe within ¼ inch of the sample/smear/surface.

5.5.6 ALLOW the instrument alpha and/or beta response to stabilize (approximately at least ten (10) seconds or more).

5.5.7 DETERMINE the net sample alpha and/or beta count rate.

5.5.8 IF contamination levels above background have been detected, CONVERT net count rate (cpm) to activity (dpm).

5.5.8.1 MULITPLY the net alpha count rate by the instrument correction factor of 7 (CF (alpha) = 7),

OR

USE $^{239}$Pu efficiency listed on the probe to determine alpha activity (dpm).

5.5.8.2 MULITPLY the net beta count rate by the instrument correction factor of 10 (CF (beta) = 10),

OR

USE $^{137}$Cs efficiency listed on the probe to determine beta activity (dpm).
5.5 Sample/Smear/Surface Activity Determination Instructions (Cont.)

Using the Digital Scaler

NOTE - Use of the digital scaler for determining contamination levels in dpm is appropriate when contamination levels are low (near release limits), particularly for alpha contamination.

5.5.9 DETERMINE a representative instrument background count rate where the sample will be counted.

5.5.9.1 PERFORM a one-minute scaler count.

5.5.9.2 DETERMINE alpha and/or beta background count rates using scaler results.

5.5.9.3 ENSURE alpha background count rate is ≤ 3 cpm when either alpha or alpha plus beta surveys are performed.

5.5.9.4 ENSURE beta background count rate is ≤ 500 cpm when beta or alpha plus beta surveys are performed.

5.5.10 DETERMINE alpha and/or beta contamination limit(s) (or levels of concern) for the survey.

5.5.11 DETERMINE confidence level required for the survey.

5.5.12 DETERMINE sample/scaler count time using the appropriate survey methodology.

5.5.12.1 USING determined representative background count rate, LOCATE AND SELECT sample/scaler count time that has alpha and/or beta MDA that is equal to or less than the contamination limit (or level of concern) for the survey.

a. IF alpha and beta measurements are being performed, ENSURE that the selected sample/scaler count time has alpha and beta MDAs that are both equal to, or less than, the contamination limit (or level of concern) for the type of contamination being measured.

5.5.13 PERFORM a scaler count of the sample/smear/surface using the selected sample count time per the appropriate survey methodology.

5.5.13.1 MAINTAIN the probe within ¼ inch of the sample/smear/surface during counts.

5.5.13.2 DETERMINE the net count rate when the count is complete.
5.5 Sample/Smear/Surface Activity Determination Instructions (Cont.)

5.5.14 IF contamination levels above background have been detected, CONVERT net count rate (cpm) to activity (dpm).

5.5.14.1 MULTPLY the net alpha count rate by the instrument correction factor of 7 (CF (alpha) = 7),

OR

USE $^{239}$Pu efficiency listed on the probe.

5.5.14.2 MULTPLY the net beta count rate by the instrument correction factor of 10 (CF (beta) = 10),

OR

USE $^{137}$Cs efficiency listed on the probe.

5.5.15 IF a more accurate result is desired, INCREASE the sample/smear/surface count time, to reduce the desired MDA AND

RECOUNT the sample.
5.6 Records

5.6.1 PERFORM the following for records identified within this procedure.

5.6.1.1 On the Records Submittal Checklist, RECORD the number of pages that were completed

OR

PLACE a check mark (√) in the N/A column.

5.6.1.2 ATTACH the completed records to the Records Submittal Checklist AND

SIGN Records Submittal Checklist indicating the package is complete.

5.6.1.3 SUBMIT the completed records to an approved RadCon Record Storage Area for retention.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RID), is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of pages completed</th>
<th>N/A (√)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Form A-6002-895, Daily Instrument Source Check Log</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

________________________________________ / __________________________ / __________

Signature Print (First and Last Name) Date

First Line Manager (or designee)