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7 February 2014

U.S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4351

LICENSE No: 24-21362-01

ATTN: Kevin Null

SUBJECT: Request for Amendment

Gentlemen:

American Radiolabeled Chemicals, Inc (ARC) is pleased to submit the following request for amending our license. We request expedited processing of this request as it will facilitate the ongoing solution of the SCO storage problem.

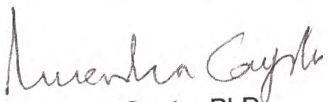
The requested changes to SOP 41 have been discussed with Robert Gatone of your office, he is in agreement that the methodology desired will be more conservative in that it will account for fixed tritium contamination as well as loose. The requested methodology will over estimate the activity in all cases.

The requested changes are attached to this letter. Words to be removed are marked with strike out, new text is in red.

If you have any questions or require clarification on any of the information stated above, you may contact our RSO at 314-991-4545.

Sincerely

AMERICAN RADIOLABELED CHEMICALS, INC


Surendra K Gupta, PhD
President.

RECEIVED FEB 11 2014

**AMERICAN RADIOLABELED CHEMICALS, INC.
STANDARD OPERATING PROCEDURE - SOP-41**

Supersedes: 12/30/2011
Reviewed by RSC:
Approved by NRC:

Page 1 of 5

SUBJECT: Inventory of Surface Contaminated Objects (SCO)

OBJECTIVE: This procedure provides a means to assure that the activity on Surface Contaminated Objects (SCO) is captured for the ARC nuclide inventory.

RESPONSIBILITY: Radiation Safety Officer (or designee, [see RPP Section 3.3.4.12](#)).

REFERENCES: a) General Reference Only: NUREG-1556, Vol 12, Program Specific Guidance About Possession Licenses for Manufacturing and Distribution, Appendix N

This reference is used for guidance only and not for any specific quantity or use.

b) General Reference Only: NUREG-1556, Vol 12, Program Specific Guidance About Possession Licenses for Manufacturing and Distribution, Appendix P

c) ARC Radiation Protection Program, Section 9

d) SOP

8 – Radioactive Waste Processing
16 – Contamination Control Program
33 – Use of PCE
38 – Laboratory Personnel Training
39 – Spills and Other Emergencies

PROGRAM

1.0 Equipment

- 1.1 Spill Kits are maintained in each Laboratory. See SOP 39 for the contents of a typical Spill Kit. (Brand names, number of each item and so forth may change without a revision of this procedure.)
- 1.2 Instruction Signs – Instruction on what to do in case of a spill or other radiological emergency are posted on each wall of each laboratory building. See SOP 39 for a Typical Sign (Names and/or Telephone Numbers may change without a revision of this procedure)
- 1.3 Properly calibrated survey instruments.

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2.0 Requirement

Letter from USNRC Region III to ARC, transmitting License renewal, dated 30 Sep 2010

3.0 Prerequisites

- 3.1 Individuals performing activities controlled by this SOP have been trained in accordance with SOP – 38
- 3.2 SCO have been appropriately stored in the waste processing facility.
- 3.3 Protective Clothing and Equipment is available in accordance with SOP – 33.

4.0 Procedure

NOTE: The analysis and labeling should take place prior to transport of the SCO to the processing facility, but may take place at the facility.

- 4.1 ~~Measure, or~~ Estimate, the surface area of the object in square centimeters. Using the largest dimensions (length, width and height) of the object, determine the surface area of this object as if it were a rectangular parrelliped. Convert this area to square centimeters.
- 4.2 Determine the surface activity of the object by taking the following measurements
 - 4.2.1 Measure, by direct scan, the total C-14 activity in counts per minute (cpm)
 - 4.2.2 Convert the cpm per probe area to disintegrations per minute (dpm) per square centimeter by multiplying by ~~0.720~~ 0.84
 - 4.2.3 Based upon historical contamination data, multiply the C14 dpm by five (5) to get the H3 dpm. ~~Measure, by dry wipe, the activity on 100 sq cm of surface.~~
 - 4.2.4 If an object has internal parts. In order to account for the internal surface area, multiply the outer surface area, found in 4.1 above,

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by three (3) to find the total surface area of the object. Count the wipe using any Liquid Scintillation Counter (LSC) protocol that delivers H-3 dpm. The LSC automatically makes corrections for quench, overlap, efficiency and background to yield results in net dpm/100-cm².

4.2.5 Convert the dpm per 100-sq cm to dpm per sq cm by dividing by 100.

NOTE: The calculations given in this procedure are listed for the rare case where the calculations must be done manually. The Inventory spreadsheet (Attachment A) performs all the required calculations

4.3 — Repeat 4.2 above for each square meter of surface area as a minimum.

4.3 Using the highest H-3 and C-14 values found in 4.3 4.2.3 above, multiply these results by the total square centimeters determined in 4.1 4.2.4 above. This result is the total C-14 and H-3 activity for the SCO. Convert to millicuries by dividing the respective dpm value by 2.22×10^9 .

4.4 Label the SCO with the results found in 4.4-4.3.

4.4.1 the next sequential number

4.4.2 the area, in sq cm, of the SCO

4.4.3 the total Tritium activity

4.4.4 the total C-14 activity

4.5 Enter the data from 4.3 in the SCO Inventory spreadsheet (Attachment A)

4.6 At the time the SCO is decontaminated and released OR the SCO is shipped as RAD Waste delete the entire entry for that object number from the spreadsheet.

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5.0 Use

- 5.1 The inventory Spreadsheet shall be used to ensure that the ARC possession limit of 12,000 Curies of Tritium and 400 Curies of C-14 is not exceeded.
- 5.2 The ~~liquid waste~~ inventory spreadsheet shall be used to update the total possession inventory (kept in SBT) on a monthly basis.
- 5.3 It is expected that the total inventory of SCO contamination activity will be a very small fraction of the ARC possession limit.

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Attachment

A

Item Number	CPM	C14 Eff.	DPM	L (in.)	W (in.)	H (in.)	S.A.	+Internal S.A.	Total S.A. (sq cm)	C14	Total DPM		Total μ Ci	
											H3	C14	H3	H3
Example-1	10,000	0.07	142857.1	10	10	10	600	1800	11612.88	95343842.36	476719211.8	4.29E+01	2.15E+02	
Example-2	15,000	0.07	214285.7	15	15	15	1350	4050	26128.98	321785468	1608927340	1.45E+02	7.25E+02	

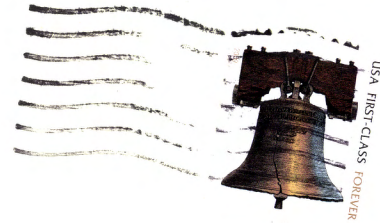
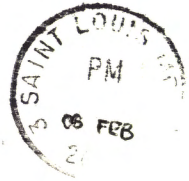
Total H3 (mCi) 9.39E-01
Total C14 (mCi) 1.88E-01

Probe Face (sq cm) 17.4
 $1\mu\text{Ci} = \text{DPM}$ $2.22\text{E}+06$



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