



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
U.S. ARMY RESEARCH INSTITUTE OF ENVIRONMENTAL MEDICINE  
KANSAS STREET, BUILDING 42  
NATICK MA 01760-5007

March 19, 2014

Office of the Commander

Licensing Assistance Team  
Division of Nuclear Materials Safety  
U.S. Nuclear Regulatory Commission Region 1  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713

Dear Sir/Ms:

We are writing in response to two more requests for additional information concerning application for renewal to license, control No. 582589.

Attached to this response you will find the two NRC request documents dated February 25 and March 3, 2014 in which three topics are listed that require additional information. The following responses will address each of these in sequential order.

1. The additional request for information dated February 26, 2014 asked that we perform a "confirmatory survey" that would include both a removable contamination survey and a direct measurements survey of surfaces within the radiation laboratory (USARIEM, Rm#247). The results of the removable contamination survey are attached in pdf form and consist of two pages. The first page shows the results of the calibration check on the Packard Tricarb 2910TR liquid scintillation counter, while the second page provides the data of the "wipe testing" (removable contamination) survey. The wipe tests were bracketed by controls/blanks and the average counts per minute of all the test samples were not significantly different from the controls. The direct measurements survey of surfaces within the radiation laboratory was performed with a calibrated (5/22/13) Berthold LB 124 Digital Contamination Monitor (serial #36516-10). The survey was performed with the instrument in "survey" mode, a mode in which the device "reacts extremely sensitively to different radiation activities and indicates changes very quickly." First, a background reading was obtained within an office that is separate from the lab to be surveyed; this produced "gross" counts per second (cps) of 10-12. Then a survey was conducted of all surfaces within the radiation laboratory; none of the surfaces displayed a gross survey reading that exceeded that of background (i.e. 10-12cps).

To address one other point in the request for additional information, the reason our previous letter stated that our monthly lab surveys were counted on a Perkin Elmer Wizard gamma counter is because USARIEM was only using the radionuclide  $I^{125}$ , a gamma emitter well suited to counting with Wizard instrumentation.

2. To elaborate on "the training for individuals working in or frequenting restricted areas" (previous Item No. 5) question, training is also provided for ancillary personnel (e.g. maintenance workers) that require access to room #247. This training consists of a specially prepared power point presentation for ancillary personnel that provides the basics of radiation safety and guidance as to the "do's and don'ts" within a radiation room, and procedures to follow in the event of an accident. It should be noted that it is USARIEM's policy that only trained and authorized personnel are allowed near the storage and use area for radioactive materials and that this is enforced via physical and administrative safeguards.
3. USARIEM will ensure that radiation dose limits for individual members of the public will be maintained below the limits in 10 CFR 20.1302, defined as being 100mRem (1mSv) in a year. According to this federal regulation a licensee may show compliance with this annual dose limit by "demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit." Given that virtually all the radionuclide work performed at USARIEM under NRC license #20-30847-01 is accomplished using  $I^{125}$  kits of low activity level (~10 microcuries/kit) with the total radioactivity of kit inventory averaging between 20-100 uCi /month, it would be impossible for individual members of the public to receive the defined dose limit of 100mRem in a year.

The purpose of this action is to answer requests for additional information related to the application to renew our current NRC license. I can be reached at 508 233-4811 or [deborah.l.whitmer.mil@mail.mil](mailto:deborah.l.whitmer.mil@mail.mil) for additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Deborah L. Whitmer", with a stylized flourish at the end.

Deborah L. Whitmer  
Colonel, Veterinary Corps  
Commanding

Enclosures

**Blaha, Michael D CIV USARMY MEDCOM USARIEM (US)**

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**From:** Wilson, Scott <Scott.Wilson@nrc.gov>  
**Sent:** Tuesday, February 25, 2014 8:17 AM  
**To:** Blaha, Michael D CIV USARMY MEDCOM USARIEM (US); Oliver, Jeffrey F CIV USARMY MEDCOM USARIEM (US)  
**Subject:** Request for Additional Information: Mail Control No. 582589  
**Importance:** High  
**Follow Up Flag:** Follow up  
**Due By:** Wednesday, February 26, 2014 1:30 PM  
**Flag Status:** Flagged

Jeffrey Oliver  
Radiation Safety Officer  
Department of the Army  
USARIEM  
Kansas St. Bldg. 42  
Natick, MA 01760

License: 20-30847-01  
Docket: 03036434  
Mail Control No.: 582589

Mr. Oliver,  
In order to complete your request for renewal of NRC License No. 20-30847-01, we will need additional information. Since you have requested a reduction in your authorized material amount for carbon-14 to below that which requires financial assurance, a confirmatory survey must be provided which includes removable contamination surveys and direct measurements of surfaces in your radioactive materials use laboratory. Surveys must be performed with adequate survey instrumentation of sufficient sensitivity for the type and quantity of radioactive contamination. Your recent letter stated that you survey the lab monthly and evaluate the samples on a Perkin Elmer Wizard gamma counter. The radiation of interest for carbon-14 and tritium is beta radiation and an appropriate counting system is a liquid scintillation counter, not a gamma counter.

Please provide a comprehensive survey of the laboratory for both removable contamination and fixed contamination so we can continue our review of your renewal application.

You may respond with a scanned copy of the survey report to my e-mail address.

Thank you for your cooperation.

Sincerely,

Scott Wilson  
Health Physicist  
Commercial, Industrial, R&D, and Academic Branch  
Division of Nuclear Materials Safety  
US Nuclear Regulatory Commission Region I  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713  
Phone: 610-337-5136  
Fax: 610-337-5269

**Blaha, Michael D CIV USARMY MEDCOM USARIEM (US)**

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**From:** Wilson, Scott <Scott.Wilson@nrc.gov>  
**Sent:** Monday, March 03, 2014 10:05 AM  
**To:** Blaha, Michael D CIV USARMY MEDCOM USARIEM (US); Oliver, Jeffrey F CIV USARMY MEDCOM USARIEM (US)  
**Subject:** Request No. 2; Request for Additional Information: Mail Control No. 582589  
**Importance:** High

Jeffrey Oliver  
Radiation Safety Officer  
Department of the Army  
USARIEM  
Kansas St. Bldg. 42  
Natick, MA 01760

License: 20-30847-01  
Docket: 03036434  
Mail Control No.: 582589

Mr. Oliver,

This is in response to your letter dated February 11, 2014, in which you responded to our request for additional information regarding your license renewal application. In order to complete your request for renewal of NRC License No. 20-30847-01, we will need additional information.

1. In your response letter, Item No. 5, you stated the training for individuals working in or frequenting restricted areas; however, you did not state the training provided to ancillary personnel that are not anticipated to accumulate exposure below 100 mrem. Such ancillary personnel may be, for example, maintenance workers, students, security personnel, and clerical personnel. If it is your policy that only trained and authorized personnel are allowed near the storage and use area for radioactive materials. Please state that in a letter.
2. Your application did not include a statement that you will ensure that the dose limits for individual members of the public will be maintained below the limits in 10 CFR 20.1302. Please state that in a letter.

You may respond to my e-mail address with a scanned copy of the letter.

Thank you for your cooperation.

Sincerely,

Scott Wilson  
Health Physicist  
Commercial, Industrial, R&D, and Academic Branch  
Division of Nuclear Materials Safety  
US Nuclear Regulatory Commission Region I  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713  
Phone: 610-337-5136  
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SNC Protocol

[Packard Tricarb 2910TR calibration check]  
(For Both C<sup>14</sup> and H<sup>3</sup>)

## Calibration Information

Software Version IC: 3.04

Software Version EC: 4.00

Instrument Model: Tri-Carb 2910TR

Instrument Serial Number: 130189

3H Chi Square: 25.33 Date Processed: 3/13/2014 10:50:26 AM

14C Chi Square: 18.03 Date Processed: 3/13/2014 10:50:26 AM

3H E<sup>2</sup>/B (1-18.6 keV): 228.76 Date Processed: 3/13/2014 10:50:26 AM14C E<sup>2</sup>/B (4-156 keV): 434.66 Date Processed: 3/13/2014 10:50:26 AM

3H Efficiency (1-18.6 keV): 61.41 Date Processed: 3/13/2014 10:50:26 AM

14C Efficiency (4-156 keV): 91.39 Date Processed: 3/13/2014 10:50:26 AM

IPA Background Date Processed: 3/13/2014 10:50:26 AM

3H Background CPM (1-18.6 keV): 16.48 Date Processed: 3/13/2014 10:50:26 AM

14C Background CPM (4-156 keV): 19.22 Date Processed: 3/13/2014 10:50:26 AM

3H Calibration DPM: 278100

3H Reference Date: 3/12/2013

14C Calibration DPM: 123900

Michael D. Blaha (13 March 2014)



[Wipe Test for  $C^{14}$  contamination in Rm<sup>#</sup> 247, USARTEM]

Assay Definition

## Assay Description:

Basic CPM assay

Assay Type: CPM

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\14c\_cpm\20140313\_1050

Raw Results Path: C:\Packard\Tricarb\Results\Default\14c\_cpm\20140313\_1050\20140313\_1050.results

Assay File Name: C:\Packard\TriCarb\Assays\14c\_cpm.lsa

Count Conditions

\* Nuclide: 14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Set: n/a

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

#Vials/Sample: 1

Repeat Sample Count: 1

Calculate % Reference: Off

Background Subtract

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	156.0
B	4.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On

Luminescence Correction: n/a

Colored Samples: n/a

Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

## Cycle 1 Results

	S#	Count	Time	CPMA	CPMB	SIS	tSIE	MESSAGES
BLANK	1	1.00		22	20	870.20	512.43	
	2	1.00		15	14	722.68	526.08	
	3	1.00		23	22	745.90	496.23	
	4	1.00		18	15	779.72	532.51	
	5	1.00		23	18	688.42	540.29	
	6	1.00		16	14	882.85	521.06	
	7	1.00		27	25	745.16	544.71	
	8	1.00		22	21	731.03	519.55	
	9	1.00		25	23	894.39	495.99	
	10	1.00		21	19	920.88	522.11	
	11	1.00		30	25	1053.99	523.43	
BLANK	12	1.00		26	24	916.19	570.71	

michele D. Blaha (3/13/14)