From:	Ullrich, Elizabeth
To:	Stewart.Chute@ct.gov
Cc:	Jackson, Todd; Reichard, Michael
Subject:	additional information needed for release of 10 Clinton Street from NRC license
Date:	Wednesday, March 26, 2014 4:32:00 PM
Attachments:	NUREG-1757.Vol2.AppB.pdf State of CT list.docx

State of Connecticut, Department of Public Health

License No. 06-27895-03

Docket No. 030-37847

Control No. 582357

Dr. Chute,

This refers to the discussion between you and I yesterday, March 25, 2014, regarding release of your facilities at 10 Clinton Street. We understand that you performed analyses of environmental sample in the laboratories at 10 Clinton Street, and that your laboratories were required to be as free of residual contamination as possible in order to prevent cross-contamination of samples. We understand that you have already vacated these laboratories and renovation has already occurred, prior to NRC review and approval of release of the facilities. We further understand that the information provided with your letter received by email on February 21, 2014, is a radiological exposure assessment of the impacted area, intended to demonstrate that the facilities were suitable for release for unrestricted use. If any of our understandings are not correct, please inform us in writing.

Although the quantities authorized on the license are very small and your surveys during operational activities indicated little or no contamination of the facilities, in order to release the facility for unrestricted use, you have to demonstrate that the facilities meet the NRC criteria in Subpart E of 10 CFR Part 20. This regulation requires that the facilities upon release not result in a dose to a member of the public of more than 25 millirem in one year. Acceptable methods of demonstrating that your facilities meet the 10 CFR Part 20 Subpart E release criteria are described in NUREG-1757, Volumes 1 and 2, "Consolidated Decommissioning Guidance". Many laboratories such as yours are able to use one of the "Simple Approaches for Conducting Final Radiological Surveys" as described in NUREG-1757, Volume 2, Appendix B (attached). This requires that you be able to use the NRC screening values for release; a table containing the screening values for the radionuclides you listed in your inventory is attached. However, because you handled alpha emitters, these surveys can require a very low minimum detectable activity.

It appears that most of the surveys and evaluations you performed do not yet demonstrate that the facilities met the NRC's release criteria for the following reasons:

Although wipe tests for removable contamination were performed, static measurements to assess the total residual contamination were not.

Surveys of ambient radiation levels were suitable for gamma emitters only

Most surveys were not sufficiently sensitive to demonstrate that the laboratories meet the current NRC screening values.

The radiological exposure assessment compared liquid values to effluent release limits, which are those concentrations that, if ingested over a period of one year by standard man, would result in a dose of 50 millirem

The radiological exposure assessment compared quantities of material in your inventory to the quantities of radionuclides listed in 10 CFR 30.71 Schedule B (sometimes referred to as "exempt quantities"). This table was established many years ago, is used for a different purpose than release for unrestricted use, and does not have a current dose basis.

Because the facilities are no longer able to be surveyed, additional information is needed to assess the dose from residual materials that may have been present in your facilities. As we discussed, information such as the following could be used to develop a dose assessment that better demonstrates that residual contamination is within the NRC release limits.

a. To estimate the source term:

- Describe the area(s) where RAM was used or stored. Indicate the number of rooms, benches, hoods, or other areas where licensed materials were used, and estimate the total surface area(s). Describe if washable trays or removable paper coverings were present in RAM use areas, reducing the likelihood of residual contamination on surfaces. Indicate the number and size of storage areas, unless those storage areas (freezers, refrigerators, etc) were moved to the new location.

- For the samples you analyzed, describe the range of activities and radionuclides, and the frequency and duration of performing sample analyses. State which radionuclides would be the most restrictive with respect to NRC screening values and the maximum quantities handled/stored in each use area.

- Describe the range of activities and radionuclides used in preparation

of standard, and the frequency and duration of standards preparation. State which would be the most restrictive radionuclide with respect to NRC screening values and the maximum quantities handled/stored in each use area.

- Describe any other handling of radioactive materials, with the range of activities and radionuclides. State which would be the most restrictive radionuclide with respect to NRC screening values and the maximum quantities handled/stored.

b. To estimate residual radioactivity of the radionuclides of concern:

- Describe the routine surveys performed in each of the areas described above, and for the various activities if the survey requirements differed. Indicate the typical survey results, and the minimum detectable activity for the surveys performed. Provide the action levels for which decontamination of areas was required.

- Describe any incidents or spills which occurred resulting in residual contamination above your action levels. Include the radionuclide(s), form, amount of activity, and size (area) of the spill.

Please note that, if your surveys for removable contamination were sufficiently sensitive [the MDA was not more than 10% of the screening value] for a particular radionuclide, AND the results of the wipe surveys were less than the MDA, then that radionuclide can be removed from consideration for the purposes of this dose assessment.

Please feel free to call and discuss this with me, as you gather the information and develop a dose assessment. When you believe you have a response that can be used to demonstrate that your facilities meet the RC release criteria, please submit that response by hard copy, or by email of Na pdf of a signed copy of the response, or by facsimile of the signed copy.

Also, your current license lists the address of your Rocky Hill facility as 325 West Street, however, your letter requesting the change of location to be from 10 Clinton Street in Hartford to 395 West Street in Rocky Hill. Confirm if the correct address number is 325 or 395.

Thanks,

Betsy

Betsy Ullrich, Senior Health Physicist
Commercial, Industrial, R&D and Academic Branch
Division of Nuclear Materials Safety
US NRC Region I Office
(610) 337-5040 (office)
(484) 919-8348 (cell)
Elizabeth.Ullrich@nrc.gov

A large number of licensees may use a simplified method to demonstrate regulatory compliance for decommissioning, avoiding complex final status surveys (FSSes). For Decommissioning Groups 1–3, licensees may use the simplified FSS method described in Appendix B of MARSSIM or the alternative protocol described in this volume below.

B.1 MARSSIM Simplified Method

The simplified method in Appendix B of MARSSIM may be used by Decommissioning Group 1 and some of Decommissioning Group 2 licensees. These are sites where radioactive materials have been used or stored only in the form of (a) non-leaking, sealed sources; (b) short half-life radioactive materials (e.g., $T_{1/2}$ #120 days) that have since decayed to insignificant quantities; (c) small quantities exempted or not requiring a specific license; or (d) combination of the above. Refer to Appendix B of MARSSIM for the details of this simplified method.

B.2 Alternative Simplified Method

This alternative method may be used by Decommissioning Groups 1–3 and is applicable only for surfaces of building structures and for surface soils. The following conditions are prerequisite to the use of this method:

C Use of screening DCGLs (including DandD code using default distributions).

C No complex or special surveys are included (e.g., volumetric building structure residual radioactivity, duct work, embedded piping, ground water residual radioactivity, subsurface soil residual radioactivity, buried conduit, sewer pipes, or prior onsite disposals).

C Not to be applied to land areas where soil has been previously remediated.

C Removable residual radioactivity for building surfaces must comply with the screening $DCGL_W$ basis of 10 % removable or adjusted per Screening Table (see Appendix H of this volume).

C MDC between 10 to 50 % of the $DCGL_W$ for scans, static or direct measurements, and sampling and analysis (using NUREG–1507 guidance).

If the above conditions are met, then the following simplified method may be used to design and conduct the FSS for each survey unit.

C Size is limited to 2000 m^2 for land areas and 100 m^2 for structures.

C Scanning and sampling to be performed:

— 100 % scan and

— 30 samples.

C Hot spot criteria is three times the $DCGL_W$, applied to any sampling location.

C A quality control program to ensure results are accurate and sources of uncertainty are identified and controlled.

C The average concentration for the survey unit is compared to the $DCGL_W$.

C Statistical tests may be the Student's *t* test, Sign test, or Wilcoxon Rank Sum test, with $\alpha = 0.05$ (no statistics are needed if all measurements are less than the $DCGL_W$).

The final status survey report (FSSR) should provide a complete and unambiguous record of the radiological status of the site and should stand on its own with minimal information incorporated by reference (see Appendix D of this volume for additional information on reporting survey results).

B.3 References

Nuclear Regulatory Commission (U.S.) (NRC). NUREG–1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions." NRC: Washington, DC. June 1998.

———————. NUREG–1575, "Multi-Agency Radiation Survey and Site Investigation Manual." NRC: Washington, DC. August 2000.

State of CT list – all RAM greater than 120 day half-life

Radionuclide	NRC screening value		licensee inventory	
	dpm/100 cm^2	uCi/100cm2	uCi (2/21/14)	uCi (10/10/13)
Am241	27	1.2E-5	**1.51E-1**	**7.42E-1**
Am243	27	1.2E-5	**5.3E-3**	**5.30E-3**
Ba133	*		1.91E-3	1.96E-3
C14	3,670,000	1.65	---	6.31E02
Cd109	11,400	5.1E-3	**9.91E-1**	**12.5**
Co57	21,100	9.5E-3	**2.84E-2**	**6.98E-2**
Co60	7,050	3.2E-3	**2.66E-1**	**1.73**
Cs134	12,700	5.7E-3	8.57E-4	9.77E-4
Cs137	28,000	1.3E-2	**2.3E-1**	**42.2**
H3	1.24 E+8	55.8	4.03E-2	9.82E-1
Ir192	74,200	3.3E-2	1.6E-10	3.18E-11
Po210	2,510	1.1E-3	---	**4.31E-03**
Pu239	28	1.3E-5	**7.75E-3**	**2.09E-3**
Pu242	30	1.4E-5	**5.10E-3**	**5.1E-3**
Ra226	1120	5.0E-5	**9.55E-4**	**1.21E-3**
Ra228	201	9.0E-5	2.56E-7	2.67E-7
Ru106	26,200	1.2E-2	1.56E-4	2.2E-4
Sb125	44,300	2.0E-2	1.09E-3	3.28E-3
Se75	107,000	5.0E-2	1.06E-7	8.83E-7
Sr90	8,710	3.9E-3	**6.34E-3**	**5.73E-1**
Te123m	263,000	1.2E-1	2.01E-2	5.27E-2
Th230	33	1.5E-5	1.16E-9	**5.15E-2**
Tl204	*			30.8
U232	17	7.7E-6	9.79E-9	**9.73E-3**
U234	91	4.1E-5	2.58E-9	**6.51E-3**
U235	98	4.4E-5	**2.34E-4**	**3.00E-4**
U238	101	4.5E-5	2.68E-9	**6.61E-3**
Zn65	48,100	2.2E-2	1.23E-4	**3.39E-1**

Inventory ~all radionuclides present at lab in dispersible form, all non-volatile, quantities as listed in letter dated February 21, 2103 (should be 2014)

** no screening value calculated, would need to run DandD

Bold indicates that inventory exceeds screening value quantity per 100 sq-cm area