Appendix A

New Mexico Environment Department, Radiation Control Bureau, Letter to Ron Cardarelli, RSO, December 6, 2019. Radionuclide-Specific Surface & Volumetric Release Criteria for Building Characterization

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December 6, 2019

Ronald D. Cardarelli, RSO
Thermo Eberline LLC
27 Forge Parkway
Franklin, MA 02038

Re: Conference call November 6, 2019, with clarifications presented by RCB regarding proposed screening surveys of contents of Building and Building AOC's.

Dear Mr. Cardarelli:

As requested on the November 6, 2019 conference call, the following clarifications are provided below:

1. Thermo proposed Technical Basis for ^{241}Am of 224 dpm/100 cm^2 free release using equipment survey to conduct screening of AOC are too high for alpha emitters.

RCB takes exception to the free release method based on equipment surveys and recommends 17 dpm/100 cm^2 removable and fixed contamination for all AOC Class 1, 2, and 3 that used, stored and shipped ^{241}Am and for all alpha emitters licensed (see Alpha emitter table below) at the site. Also, where removable and fixed activity identified above 17 dpm/100 cm^2 alpha, supplemental samples (minimum mass 50-100 grams) shall be collected. The samples should be obtained from the walls, floors, and ceilings and analyzed by radiochemistry (i.e., alpha spectrometry to meet MDA of 0.05 pCi/gm).

Alpha emitters table

Nuclide	dpm/100 cm^2	Wipe	Radiochemistry	Action limit corresponding to 15 mrem/yr	MDA pCi/gm
^{241}Am	17	Removable	Alpha spec	1.25 pCi/gm	0.05
^{239}Pu	17	Removable	Alpha spec	1.37 pCi/gm	0.05
^{238}Pu	19	Removable	Alpha spec	1.52 pCi/gm	0.05

^{235}U	59	Removable	Alpha spec	4.82 pCi/gm	0.05
^{244}Cm	30	Removable	Alpha spec	2.5 pCi/gm	0.05
^{237}Np	14	Removable	Alpha spec	0.6 pCi/gm	0.05
^{252}Cf	52	Removable	Alpha spec	4.12 pCi/gm	0.05

2. Thermo proposed Technical Basis for the free release of the building and its contents for Beta/gamma radiation in the AOC Class 1, 2, and 3 for ^{137}Cs, ^{14}C are acceptable. Provided the action limits from sample analysis meet the values in the table below.

RCB recommends the addition of ^{3}H, ^{90}Sr, and that MDA should meet 0.1 pCi/gm for ^{90}Sr, 1 pCi/gm for ^{14}C, 3 pCi/gm for ^{3}H, 1 pCi/gm for ^{137}Cs.

Nuclide	dpm/100 cm^2	Wipe	Radiochemistry	Action limit corresponding to 15 mrem/yr	MDA pCi/gm
^{3}H	1.14E+08	Removable	Liquid Scintillation	64.8 pCi/gm	1.0
^{14}C	2.22E+06	Removable	Liquid Scintillation	6.96 pCi/gm	1.0
^{90}Sr	4.67E+03	Removable	Radiochemistry	1.03 pCi/gm	0.1
^{137}Cs	1.68E+04	Removable	High resolution Gamma Spec	6.60 pCi/gm	1.0

The Bureau is prepared to review the information provided in this letter requested by Thermo in the scheduled December 11, 2019, conference call.

Sincerely,

Santiago M. Rodriguez
Bureau Chief
Radiation Control Bureau
cc: file