From:	Lawyer, Dennis
To:	"haleem@cua.edu"
Subject:	The Catholic University of America, Request for Additional Information Concerning Application for a License Amendment, Control 590584
Date:	Monday, May 02, 2016 11:27:00 AM

Dear Mr. Haleem,

This is in reference to your letter dated April 5, 2016, requesting for amendment to Nuclear Regulatory Commission License No. SUD-157, Docket No. 04006329. We also received the calibration certificate attached to an electronic mail dated April 28, 2016. In order to continue our review, we need the following additional information:

1. The calibration certificate state that the instrument 4 p efficiency is 11.00%. In your survey, a 4 p efficiency of 10.79% was used. In NUREG-1575, Rev 1, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Page 6-25, in section 6.5.4, it states:

   > The source efficiency is defined as the ratio of the number of particles of a given type emerging from the front face of a source and the number of particles of the same type created or released within the source per unit time. The source efficiency takes into account the increased particle emission due to backscatter effects, as well as the decreased particle emission due to self-absorption losses. For an ideal source (i.e., no backscatter or self-absorption), the value of the source efficiency is 0.5. Many real sources will exhibit values less than 0.5, although values greater than 0.5 are possible, depending on the relative importance of the absorption and backscatter processes.
   >
   > Source efficiency may be determined experimentally,. Alternately, ISO-7503-1 (ISO 1988) makes recommendations for default source efficiencies. A source efficiency of 0.5 is recommended for beta emitters with maximum energies above 0.4 MeV. Alpha emitters and betta emits with maximum beta energies between 0.15 and 0.4 MeV have a recommended source efficiency of 0.25. Source efficiencies for some common surface materials and overlaying materials are provided in NUREG-1507 (NRC 1997b).

   Based on the efficiency on the certificate and the efficiency used in the survey, it appears that a source efficiency of 0.5 was used for this survey of alpha measurements. Please state how the lower source efficiency for alpha particles was accounted during this survey and how the 4 p efficiency of 10.79% was determined.

2. For Maloney Hall, for use of unsealed materials with half-lives greater than 120 days, submit records for disposal made pursuant to 10 CFR 20.2002 (alternate disposal procedures, including burial authorized prior to January 28, 1981), 20.2003 (disposals to the sanitary sewerage system), 20.2004 (incineration of wastes), 20.2005 (disposal of specific wastes including liquid scintillation cocktail and animal tissue), and 20.2103(b)(4), evaluations of effluent releases. Also please submit records important for decommissioning as described in 40.36(f). Examples of such

records include but are not limited to: records of contamination, identifying the radionuclides, quantities and concentrations; as-built drawings and modifications of structures and equipment in restricted areas and locations of inaccessible contamination such as buried pipes; a single list, and updated at least every 2 years, of areas to which access is limited for the purpose of radiation protection (restricted areas). Or state that there are no records and the records were not required as you had no events for these processes in Maloney Hall.

We will continue our review upon receipt of this information. Please reply to my attention at the Region 1 Office (Address below) and refer to Mail Control No. 590584. If you have technical questions regarding this letter, please call me at (610) 337-5366.

Your reply must be an originally signed and dated letter. The letter may be scanned and submitted as a pdf document attached to an email; or it may be transmitted by facsimile to (610) 337-5269; or it may be sent by regular mail. If we do not receive a reply from you within 30 calendar days from the date of this e-mail, we will assume that you do not wish to pursue your application OR amendment request.

Please respond by e-mail to acknowledge that you have received the e-mail request for additional information.

Region 1 Office Mailing Address: Licensing Assistance Team, US Nuclear Regulatory Commission Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406-2713.

Dennis Lawyer
U.S. NRC Region 1
Health Physicist
610-337-5366