

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

0303800 *5/30/11*

Licensee 1. Taylor University 2. 236 Reade Avenue Upland, IN 46989	In accordance with letter dated July 21, 2010, 3. License number 13-04004-02 is amended in its entirety to read as follows: 4. Expiration date May 31, 2011 5. Docket No. 030-14763 Reference No.
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6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Carbon-14	A. Any	A. 1 millicurie
B. Phosphorus-32	B. Any	B. 1 millicurie
C. Chromium-51	C. Any	C. 1 millicurie
D. Silver-110	D. Any	D. 20 microcuries
E. Iodine-131	E. Any	E. 1 millicurie
F. Barium-133	F. Any	F. 0.2 millicurie
G. Cesium-137	G. Any	G. 5 millicuries
H. Cadmium-109	H. Sealed source (ORTEC)	H. 1 millicurie
I. Americium-241	I. Electro-deposited on platinum foil (Monsanto Research Corporation)	I. 0.1 millicurie
J. Hydrogen-3	J. Gas in sealed glass tube	J. 2000 millicuries
K. Cesium-137	K. Sealed source	K. 30 microcuries

9. Authorized Use:

A. through K. Possession and storage only with intent to dispose

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CONDITIONS

10. Licensed material shall be used or stored only at the licensee's facilities located in the Nussbaum Science Center, Modern Physics lab (NS 213) or the Biochemistry lab (NS 307) on the campus of Taylor University, 236 Reade Avenue, Upland, Indiana.
11. The Radiation Safety Officer for this license is Dan Hammond.
12. Licensed material listed in Subitems 6A. through K. above is only authorized for use by, or under the supervision of, the following individuals for the materials and uses indicated

Authorized User

Materials and Use

Andrew P. Whipple, Ph.D.

Carbon-14
Phosphorus-32
Chromium-51
Silver-110
Iodine-131
Barium-133
Cesium-137
Cadmium-109
Cesium-137 (sealed source)

Dan G. Hammond

Carbon-14
Hydrogen-3
Phosphorus-32
Cesium-137 (sealed source)

Hank Voss

Americium-241
Cesium-137 (sealed source)

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.
- B. Notwithstanding Paragraph A of this Condition, sealed sources and detector cells designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

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- E. Sealed sources need not be leak tested if:
- (i) they contain only hydrogen-3; or
 - (ii) they contain only a radioactive gas; or
 - (iii) the half-life of the isotope is 30 days or less; or
 - (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
 - (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- F. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.
- G. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
14. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.
15. Licensed material shall not be used in or on human beings or in field application where activity is released except as provided otherwise by specific condition of this license.
16. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
17. The licensee shall conduct radiation surveys of laboratory areas as follows:
- a. Laboratory areas where only small quantities of radioactive material are used (less than 100 microcuries) shall be surveyed monthly.
 - b. All other laboratory areas shall be surveyed weekly.
 - c. The weekly and monthly surveys will consist of:
 1. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.

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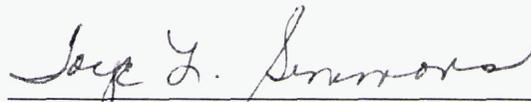
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2. A series of wipe tests to measure contamination levels. The method for performing wipe tests shall be sufficiently sensitive to detect 100 dpm/100cm² for the contaminant involved.
18. Sealed sources containing licensed material shall not be opened or sources removed from source holders by the licensee
19. The licensee shall conduct a physical inventory every 6 months to account for all radioactive material received and possessed under the license
20. Survey instruments shall be calibrated at annual intervals by the manufacturer or any organization authorized to provide calibration services under an NRC or Agreement State license.
21. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated November 20, 2000 (with attachments); and
- B. Letter dated **July 21, 2010**.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date OCT 07 2010

By

Toye L. Simmons
Materials Licensing Branch
Region III