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.

Licensee	
1. Cardinal Health 414, LLC	3. License number 34-32840-01
2. 7000 Cardinal Place Dublin, Ohio 43017	4. Expiration date October 31, **2022**
	5. Docket No. 030-38511

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 11	A. Any	A. 10 curies
B. Nitrogen 13	B. Any	B. 10 curies
C. Oxygen 15	C. Any	C. 10 curies
D. Fluorine 18	D. Any	D. 30 curies
E. Any byproduct material with atomic numbers 3 through 83, inclusive	E. Incidentally Activated Products (foils, target body, magnet coils, yoke, vacuum tank, and concrete shield)	E. 200 millicuries per radionuclide and 5 curies total
F. Sodium 24	F. Incidentally Activated Products	F. 10 millicuries
G. Aluminum 28	G. Incidentally Activated Products	G. 10 millicuries
H. Scandium 48	H. Incidentally Activated Products	H. 15 millicuries
I. Vanadium 47	I. Incidentally Activated Products	I. 15 millicuries
J. Vanadium 48	J. Incidentally Activated Products	J. 15 millicuries
K. Chromium 51	K. Incidentally Activated Products	K. 50 millicuries
L. Manganese 52	L. Incidentally Activated Products	L. 200 millicuries
M. Manganese 52m	M. Incidentally Activated Products	M. 200 millicuries
N. Manganese 54	N. Incidentally Activated Products	N. 10 millicuries
O. Manganese 56	O. Incidentally Activated Products	O. 10 millicuries
P. Cobalt 56	P. Incidentally Activated Products	P. 200 millicuries
Q. Cobalt 57	Q. Incidentally Activated Products	Q. 100 millicuries
R. Cobalt 58	R. Incidentally Activated Products	R. 50 millicuries
S. Cobalt 60	S. Incidentally Activated Products	S. 15 millicuries
T. Cobalt 64	T. Incidentally Activated Products	T. 10 millicuries
U. Copper 60	U. Incidentally Activated Products	U. 50 millicuries
V. Copper 61	V. Incidentally Activated Products	V. 25 millicuries

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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
W. Zinc 63	W. Incidentally Activated Products	W. 15 millicuries
X. Zinc 65	X. Incidentally Activated Products	X. 15 millicuries
Y. Niobium 93m	Y. Incidentally Activated Products	Y. 15 millicuries
Z. Niobium 94m	Z. Incidentally Activated Products	Z. 100 millicuries
AA. Molybdenum 93m	AA. Incidentally Activated Products	AA. 100 millicuries
BB. Technetium 95m	BB. Incidentally Activated Products	BB. 10 millicuries
CC. Technetium 96	CC. Incidentally Activated Products	CC. 10 millicuries
DD. Rhenium 183	DD. Incidentally Activated Products	DD. 10 millicuries
EE. Rhenium 184	EE. Incidentally Activated Products	EE. 10 millicuries
FF. Sodium 22	FF. Sealed Source (Eckert-Ziegler Model RV-022)	FF. 200 microcuries per source and 400 microcuries total
GG. Sodium 22	GG. Sealed Source (Eckert-Ziegler Model Type R)	GG. 1 microcurie per source and 2 microcuries total
HH. Cobalt-57	HH. Sealed Source (Eckert-Ziegler or IPL-E-vial Model RV-057)	HH. 15 millicuries per source and 30 millicuries total
II. Cesium-137	II. Sealed Source (Eckert-Ziegler or IPL-E-vial Model RV-137)	II. 300 microcuries per source and 400 microcuries total
JJ. Barium-133	JJ. Sealed Source (Eckert-Ziegler or IPL E-vial Model RV-133)	JJ. 300 microcuries per source and 400 microcuries total
KK. Technetium 99m	KK. Any	KK. 5 curies

9. Authorized use:

A. through D. Production, packaging and distribution of manufactured radiochemicals to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the U.S. Nuclear Regulatory Commission or any Agreement State.

E. through EE. Possession and storage of byproduct materials incidental to radionuclide production.

FF. through KK. Calibration of the licensee's instruments.

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CONDITIONS

10. Licensed material may be used or stored only at the licensee's facilities located at the Michigan State University Radiology Department Clinical Center, 138 East Service Road, East Lansing, Michigan.

11. Licensed material shall be used by, or under the supervision of Robert Symons, John Taylore Vernon, Kun Li, Douglas Carver, Tuan Le, Robert Nilsson, Ken Moore, Carl Beasley, Don James, Dean Pruitt, John Zhang, Joseph Seckman, Michael Rosman, Jason Foster, Leonard Popa, Gary Skoff, Timothy Wright, or Tuan Le.

12. The Radiation Safety Officer for this license is Robert Symons.

13. This license does not authorize distribution to persons licensed pursuant to 10 CFR 32.72 or 32.74; to persons exempt from licensing; or to general licensees.

14. The licensee shall not use licensed material in or on human beings.

15. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed six months or at the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to primarily 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 the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

D. Sealed sources need not be tested if they contain only hydrogen-3; or they contain only a radioactive gas; or the half-life of the isotope is 30 days or less; or they contain not more than 100 microcuries of beta- and/or gamma-emitting material or not more than 10 microcuries of alpha-emitting material.

E. Sealed sources need not be tested if they 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 shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

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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, including leak test sample collection and analysis, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

H. Records of leak test results shall be kept in units of microcuries and shall be maintained for 5 years.

16. The licensee shall conduct a physical inventory every six months, or at other intervals approved by the U.S. Nuclear Regulatory Commission, to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory and shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.

17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

18. The licensee is authorized to hold byproduct material with a physical half-life of less than or equal to 120 days for decay-in-storage before disposal without regard to its radioactivity if the licensee:

A. Monitors byproduct material at the surface before disposal and determines that its radioactivity cannot be distinguished from the background radiation level with an appropriate radiation detection survey meter set on its most sensitive scale and with no interposed shielding; and

B. Removes or obliterates all radiation labels, except for radiation labels on materials that are within containers and that will be managed as biomedical waste after they have been released from the licensee; and

C. Maintains records of the disposal of licensed materials for 3 years. The record must include the date of disposal, the survey instrument used, the background radiation level, the radiation level measured at the surface of each waste container, and the name of the individual who performed the disposal.

19. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

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20. The licensee shall provide acceptable decommissioning financial assurance (DFA) as required by 10 CFR Part 30, Section 30.35. The licensee shall submit DFA progress reports to the U.S. Nuclear Regulatory Commission, Region III, Attention: Chief, Nuclear Materials Licensing Branch, 2443 Warrenville Road, Suite 210, Lisle, Illinois 60532, to update the NRC on the status of their DFA. The licensee shall submit DFA progress reports every 30 days until such time that DFA is submitted to the NRC for review. If the NRC determines that the DFA is not acceptable, the licensee shall continue to submit DFA progress reports every 30 days until acceptable DFA is provided to the NRC.

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 U.S. 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 October 3, 2011; and

    B. Letter dated December 5, 2011 (with attachments).

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date OCT 11 2012

By _____

Kevin G. Null
Materials Licensing Branch
Region III