

**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, 37, 39, 40, 70 and 71, 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.

<b>Licensee</b>  1. South Dakota School of Mines and Technology		In accordance with letter dated October 7, 2016	4. Expiration Date: April 30, 2020
2. 501 East Saint Joseph Street Rapid City, SD 57701		3. License number: 40-27640-01 is amended in its entirety to read as follows:	5. Docket No.: 030-35198 Reference No.:
6. Byproduct, source, and/or special nuclear material  A. Nickel-63  B. Californium-252  C. Americium-241/ Beryllium D. Radium-226  E. Lead-210	7. Chemical and/or physical form  A. Sealed, Plated, or Foil Sources (Eckert & Ziegler Isotope Laboratories dba Isotope Products Laboratories, Model NER-004)  B. Sealed Sources (Eckert & Ziegler, Model AF-252-A2)  C. Sealed Neutron Source (Eckert & Ziegler, Model AMNB3423)  D. Sealed Sources (Pylon Claibration Technologies, Model RN-1025)  E. Sealed Sources (NMC Serial 8075)	8. Maximum amount that licensee may possess at any one time under this license  A. 20 millicuries per source and 20 millicuries total  B. 135.1 nanocuries per source and 135.1 nanocuries total  C. 90 microcuries per source and 90 microcuries total  D. 3 microcuries per source and 3 microcuries total  E. 4.2 nanocuries per source and 4.2 nanocuries total	9. Authorized use  A. For storage only in a Sensor TOF 2000TM mass spectrometer.  B. For use as a calibration or reference source.  C. For use as a calibration or reference source.  D. Research and development as defined in 10 CFR 30.4, teaching and training of students.  E. For use as calibration or reference sources.

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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	9. Authorized use
F. Radium-226	F. Sealed Sources (Serial 151-36)	F. 5.58 nanocuries per source and 5.58 nanocuries total	F. For use as calibration or reference sources.
G. Plutonium-239	G. Sealed Sources (Eberline Serial S2716)	G. 0.05 microcuries per source and 0.05 microcuries total	G. For use as calibration or reference sources.
H. Americium-241	H. Sealed Sources (Eberline Serial S2723)	H. 0.05 microcuries per source and 0.05 microcuries total	H. For use as calibration or reference sources.
I. Thorium-230	I. Sealed Sources (Eberline Serial 10438)	I. 0.05 microcuries per source and 0.05 microcuries total	I. For use as calibration or reference sources.
J. Thorium-230	J. Sealed Sources (Eberline Serial S2721)	J. 0.05 microcuries per source and 0.05 microcuries total	J. For use as calibration or reference sources.
K. Plutonium-239	K. Sealed Sources (Eberline Serial S2722)	K. 0.05 microcuries per source and 0.05 microcuries total	K. For use as calibration or reference sources.
L. Thorium-230	L. Sealed Sources (Eberline Serial S2720)	L. 0.05 microcuries total	L. For use as calibration or reference sources.
M. Phosphorus-32	M. Any	M. 2 millicuries total	M. Research and development as defined in 10 CFR 30.4, teaching and training of students.

**CONDITIONS**

10. A. Licensed material listed in Item 6.A. through 6.M shall be stored in the Chemical & Biological Engineering Chemistry Building, South Dakota School of Mines and Technology, 501 East Saint Joseph Street, Rapid City, South Dakota.



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- B. Licensed material listed in Items 6.B. and 6.L. shall be used and stored in the Foundation Building, South Dakota School of Mines and Technology, 306 East Saint Joseph Street, Rapid City, South Dakota.
- C. Licensed material listed in Items 6.B. through 6.L. shall be used and stored in the Electrical Engineering/Physics Building, South Dakota School of Mines and Technology, 501 East Saint Joseph Street, Rapid City, South Dakota.
11. In accordance with the requirements set forth in 10 CFR 30.36(d), the licensee shall promptly notify the U.S. Nuclear Regulatory Commission, in writing, of a decision not to complete the facility, acquire equipment, or possess and use authorized material.
12. A. Licensed material shall be used by, or under the supervision of, Margaret Smallbrock and Jerilyn Roberts. Item 6.M. shall be used under the supervision of, David Gilley, Ph.D., and Richard Sinden, Ph.D.
- B. The Radiation Safety Officer for this license is Margaret Smallbrock.
13. The licensee shall conduct a physical inventory every 6 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.
14. 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 designed to primarily emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

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- 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 by 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.
- F. The leak test shall be capable of detecting the presence of 0.005 microcuries (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcuries (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50C(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd., Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Nuclear Materials Safety. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- G. Tests for leakage and/or contamination shall be performed by persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services. In addition, the licensee is authorized to collect leak test samples but not perform the analysis; analysis of leak test samples must be performed by persons specifically licensed by the 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 3 years.



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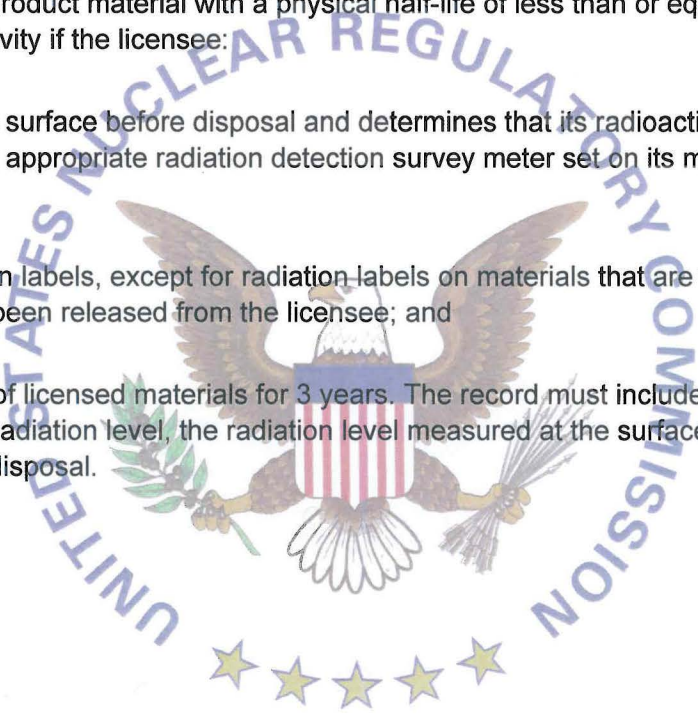
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15. Maintenance, repair, cleaning, replacement, and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.
16. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
17. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.
18. A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperature from exceeding that specified by the manufacturer and approved by the U.S. Nuclear Regulatory Commission.
- B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to be outside.
19. Radioactive waste possessed under this license shall be stored in accordance with the statements, representations, and procedures included with the licensee's waste storage plan described in the licensee's application dated April 14, 2009.
20. The licensee shall not use licensed material in or on humans except as provided otherwise by specific condition of this license.
21. This license does not authorize commercial distribution of licensed material.
22. The Licensee shall maintain records of information related to decommissioning as specified in 10 CFR 30.35(g) until this license is terminated by the Commission.
23. The licensee shall not use licensed material in field applications where activity is released except as provided otherwise by specific condition of this license.

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24. 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 the 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.
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- The seal of the United States Nuclear Regulatory Commission is centered on the page. It features an eagle with wings spread, perched on a shield with vertical stripes. The eagle is flanked by olive branches and arrows. The words "UNITED STATES NUCLEAR REGULATORY COMMISSION" are written in a circular path around the eagle, with five stars at the bottom.

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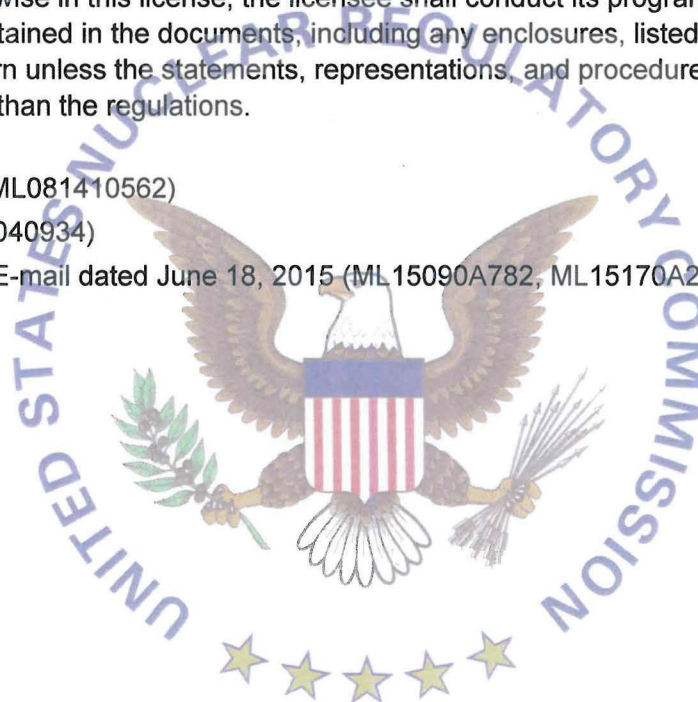
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25. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear 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 April 14, 2009 (ML081410562)

B. Letter dated April 6, 2010 (ML101040934)

C. Letter dated March 26, 2015 and E-mail dated June 18, 2015 (ML15090A782, ML15170A256)



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: February 2, 2017By: Michelle R. Simmons

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