U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 8

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.

Licensee	In accordance with application dated February 13, 2019.	4. Expiration Date: March 31, 2025
1. Niowave, Inc. 2. 1012 N. Walnut Street Lansing, MI 48906-5061	3. License number: 21-35144-02 is amended in its entirety to read as follows:	5. Docket No.: 030-38770 Reference No.:

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
A. Uranium-234	A. Solid	A. 0.88 grams (5.45 millicuries) (enriched uranium)	A. For research and development as defined in 10 CFR 30.4.
B. Uranium-235	B. Solid	B. 120 grams (0.26 millicuries) (enriched uranium)	B. Same as Item 9.A.
C. Uranium-238	C. Solid	C. 16.76 kilograms (5.63 millicuries) (enriched uranium)	C. Same as Item 9.A.
D. Uranium (Natural)	D. Solid	D. 454 kilograms (322 millicuries)	D. Same as Item 9.A.
E. Uranium (Natural)	E. Any	E. 10 kilograms (7.1 millicuries)	E. Same as Item 9.A.
F. Thorium (Natural)	F. Solid	F. 230 kilograms (50 millicuries)	F. Same as Item 9.A.

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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
G. Molybdenum-99	G. Solid	G. 1 millicurie total	G. (1) For production, possession, or handling of radiochemicals for transfer to person authorized to receive the licensed material in accordance with the terms and conditions of a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State. (2) Research and development as defined in 10 CFR 30.4. (3) For packaging and distribution of produced radiochemicals to persons authorized to receive licensed materials in accordance with the terms and conditions of specific licenses issued by the U.S. Nuclear Regulatory Commission or Agreement States. This material should not be distributed as a radiopharmaceutical or radioactive drug.
H. Molybdenum-99	H. Any	H. 10 microcuries total	H. Same as Item 9.G.
I. Strontium-89	I. Solid	I. 1 millicurie total	I. Same as Item 9.G.
J. Strontium-89	J. Any	J. 10 microcuries total	J. Same as Item 9.G.
K. Strontium-91	K. Solid	K. 1 millicurie total	K. Same as Item 9.G.
L. Strontium-91	L. Any	L. 10 microcuries total	L. Same as Item 9.G.

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M. Strontium-92	M. Solid	M. 1 millicurie total	M. Same as Item 9.G.
N. Strontium-92	N. Any	N. 10 microcuries total	N. Same as Item 9.G.
O. Krypton- 85m	O. Solid	O. 1 millicurie total	O. Same as Item 9.G.
P. Krypton- 85m	P. Any	P. 10 microcuries total	P. Same as Item 9.G.
Q. Krypton-87	Q. Solid	Q. 1 millicurie total	Q. Same as Item 9.G.
R. Krypton-87	R. Any	R. 10 microcuries total	R. Same as Item 9.G.
S. Krypton-88	S. Solid	S. 1 millicurie total	S. Same as Item 9.G.
T. Krypton-88	T. Any	T. 10 microcuries total	T. Same as Item 9.G.
U. Iodine-131	U. Solid	U. 1 millicurie total	U. Same as Item 9.G.
V. Iodine-131	V. Any	V. 10 microcuries total	V. Same as Item 9.G.
W. Iodine-132	W. Solid	W. 1 millicurie total	W. Same as Item 9.G.
X. Iodine-132	X. Any	X. 10 microcuries total	X. Same as Item 9.G.
Y. Iodine-132m	Y. Solid	Y. 1 millicurie total	Y. Same as Item 9.G.
Z. Iodine-132m	Z. Any	Z. 10 microcuries total	Z. Same as Item 9.G.
AA. Iodine-133	AA. Solid	AA. 1 millicurie total	AA. Same as Item 9.G.
AB. Iodine-133	AB. Any	AB. 10 microcuries total	AB. Same as Item 9.G.
AC. Iodine-134	AC. Solid	AC. 1 millicurie total	AC. Same as Item 9.G.

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AD. Iodine-134	AD. Any	AD. 10 microcuries total	AD. Same as Item 9.G.
AE. Iodine-135	AE. Solid	AE. 1 millicurie total	AE. Same as Item 9.G.
AF. Iodine-135	AF. Any	AF. 10 microcuries total	AF. Same as Item 9.G.
AG. Xenon-133	AG. Solid	AG. 1 millicurie total	AG. Same as Item 9.G.
AH. Xenon-133	AH. Any	AH. 10 microcuries total	AH. Same as Item 9.G.
AI. Xenon-133m	AI. Solid	AI. 1 millicurie total	AI. Same as Item 9.G.
AJ. Xenon-133m	AJ. Any	AJ. 10 microcuries total	AJ. Same as Item 9.G.
AK. Xenon-138	AK. Solid	AK. 1 millicurie total	AK. Same as Item 9.G.
AL. Xenon-138	AL. Any	AL. 10 microcuries total	AL. Same as Item 9.G.
AM. Any byproduct material with Atomic Numbers 1 through 83 with half-life less than or equal to 120 days	AM. Solid	AM. 35 millicuries total	AM. Same as Item 9.G.
AN. Any byproduct material with Atomic Numbers 1 through 83 with half-life less than or equal to 120 days	AN. Any	AN. 100 microcuries total	AN. Same as Item 9.G.

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AO. Any byproduct material with Atomic Numbers 1 through 83 with half-life greater than 120 days	AO. Solid	AO. 250 microcuries total	AO. Same as Item 9.G.
AP. Any byproduct material with Atomic Numbers 1 through 83 with half-life greater than 120 days	AP. Any	AP. 1 microcurie total	AP. Same as Item 9.G.
AQ. Any byproduct material with Atomic Numbers 84 through 103	AQ. Solid	AQ. 20 millicuries total	AQ. For possession and storage of byproduct materials incidental to radionuclide production.
AR. Any byproduct material with Atomic Numbers 84 through 103	AR. Any	AR. 5 millicuries total	AR. For possession and storage of byproduct materials incidental to radionuclide production.
AS. Gold-198	AS. Solid	AS. 1 millicurie total	AS. Same as Item 9.G.
AT. Californium-252	AT. Sealed Sources (Frontier Technology Corporation, Model FTC 100 Series)	AT. 20 microcuries per source and 20 microcuries total	AT. For use as calibration and/or reference standards.
AU. Any byproduct material with Atomic Numbers 1 through 83 with half-life less than or equal to 120 days	AU. Incidentally Activated Products	AU. 501 microcuries total	AU. For possession and storage of byproduct materials incidental to target activation.
AV. Any byproduct material with Atomic Numbers 1 through 83 with half-life greater than 120 days	AV. Incidentally Activated Products	AV. 10 microcuries total	AV. For possession and storage of byproduct materials incidental to target activation.

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AW. Europium-152	AW. Custom Sealed Source (Eckert & Ziegler,)	AW. 1.2 microcuries per source and 4.8 microcuries total	AW. In NIST traceable calibration sources.
AX. Radium-226	AX. Any	AX. 120 millicuries total	AX. For possession and use in accordance with letter dated March 2, 2018 (ML18064A260).
AY. Radon-222	AY. Any	AY. 120 millicuries total	AY. Same as Item 9.G.
AZ. Actinium-225	AZ. Activation Products	AZ. 10 millicuries total	AZ. Same as Item 9.G.
BA. Lead-210	BA. Any	BA. 95 millicuries total	BA. Same as Item 9.G.
BB. Lead-214	BB. Any	BB. 120 millicuries total	BB. Same as Item 9.G.
BC. Bismuth-210	BC. Any	BC. 95 millicuries total	BC. Same as Item 9.G.
BD. Bismuth-213	BD. Any	BD. 10 millicuries total	BD. Same as Item 9.G.
BE. Bismuth-214	BE. Any	BE. 120 millicuries total	BE. Same as Item 9.G.
BF. Polonium-210	BF. Any	BF. 95 millicuries total	BF. Same as Item 9.G.
BG. Any byproduct material with Atomic Number 81 or greater with half-life less than or equal to 120 days	BG. Incidentally Activated Products	BG. 615 millicuries total	BG. For possession and storage of byproduct materials incidental to possession of radium-226.
BH. Any radioactive material with half-life less than or equal to 120 days	BH. Any	BH. 500 microcuries total	BH. For possession and storage of activated radioactive materials incidental to irradiation of licensed materials.

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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
BI. Any radioactive material with half-life greater than 120 days	BI. Solid	BI. 10 microcuries total	BI. For possession and storage of activated radioactive materials incidental to irradiation of licensed materials.

CONDITIONS

10. Licensed material may be used or stored only at the licensee's facilities located at 1012 North Walnut Street, Lansing, Michigan, 48906.

11. The Radiation Safety Officer for this license is William Peters, Ph.D.

12. A. Licensed material shall only be used by, or under the supervision of:

Authorized Users	Material and Use
Alex Bakken, Ph.D.	All, except Subitems 6.AX. through 6.BI. (limited to licensed materials in solid form only)
Amanda Grimm	Natural uranium
Terry Grimm, Ph.D.	All, except Subitems 6.AX. through 6.BI. (limited to licensed materials in solid form only)
Nathan Johnson	Uranium, molybdenum-99, xenon-133, and krypton-85m
Christine Krizmanich	Uranium and molybdenum-99
William Peters, Ph.D.	All, except Subitems 6.AX. through 6.BI.
Kristin Shannon, Ph.D.	All, except Subitems 6.AX. through 6.BI.
Valeriia Starovoitova, Ph.D.	All, except Subitems 6.AX. through 6.BI.

B. Licensed material shall only be used by, or under the supervision and in the physical presence of,

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Authorized Users	Material and Use
Artem Gelis, Ph.D.	All

13. This license does not authorize commercial distribution of licensed material pursuant to 10 CFR 32.72 or 10 CFR 32.74 to persons generally licensed pursuant to 10 CFR Part 31 or equivalent regulations of any Agreement State; or to persons exempt from licensing pursuant to 10 CFR 30.14 through 10 CFR 30.21 inclusive, or equivalent regulations of any Agreement State.

14. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed 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. In the absence of a registration certificate, sealed sources shall be tested for leakage and/or contamination at intervals not to exceed 6 months, or at such other intervals as specified.

B. 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.

C. 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.

D. 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.

E. The leak test shall be capable of detecting the presence of 185 becquerels (0.005 microcuries) of radioactive material on the test sample. If the test reveals the presence of 185 becquerels (0.005 microcuries) 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.

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F. Analysis of leak test samples 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. The licensee is authorized to collect leak test samples but not perform the analysis.

G. Records of leak test results shall be kept in units of becquerels (microcuries) and shall be maintained for 3 years.

15. Sealed sources containing licensed material shall not be opened or sources removed from source holders by the licensee, except as specifically authorized.

16. The licensee is authorized to hold radioactive material with a physical half-life of less than or equal to 120 days for decay-in-storage before disposal in ordinary trash provided:

A. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

B. A record of each such disposal permitted under this license condition shall be retained for 3 years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

17. 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 sealed sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 3 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.

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18. 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. This license condition applies only to those procedures that are required to be submitted in accordance with the regulations. 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 February 11, 2015 (ML15043A755)
B. Letter dated February 11, 2015 (ML15043A755)
C. Letter dated February 24, 2015 (ML15065A251)
D. Letter dated March 5, 2015 (ML15065A252)
E. Letter dated March 18, 2015 (ML15077A371)
F. Letter dated July 7, 2015 excluding change to upper limit of low enriched uranium to <20% (ML15196A611)
G. Letter dated September 24, 2015 (ML15272A374)
H. RSO delegation of authority dated October 6, 2015 (ML15280A086)
I. Letter dated January 20, 2017 excluding the request for low enriched uranium and natural uranium in readily dispersible form (ML17027A205)
J. Letter dated April 21, 2017 (ML17114A407)
K. Letter dated August 9, 2017 (ML17227A249)
L. Letter dated October 12, 2017 (ML17285A908)
M. Letter dated January 19, 2018 (ML18025B330)
N. Letter dated February 5, 2017 received February 5, 2018 (ML18036A980)
O. Letter dated June 29, 2018 (ML18183A306)
P. Letter dated September 10, 2018 (ML18254A360)
Q. Letter dated September 28, 2018 (ML18274A261)

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R. Letter dated March 2, 2018 excluding Decommissioning Funding Plan & Cost Estimate (ML18064A260)
S. Letter dated July 17, 2018 (ML18199A455)
T. Letter dated September 24, 2018 (ML18269A294)
U. Letter dated March 5, 2019 (ML19065A058)

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: MAR 13 2019

By: _____
Cassandra F. Frazier
Region 3