

(05-2012)
10 CFR 30.36(j)(1); 40.42(j)(1);
70.38(j)(1); and 72.54(k)(5)(1)(1)

CERTIFICATE OF DISPOSITION OF MATERIALS

Estimated burden per response to comply with this mandatory collection request: 30 minutes. This submittal is used by NRC as part of the basis for its determination that the facility is released for unrestricted use. Send comments regarding burden estimate to the Information Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0028), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE NAME AND ADDRESS

Northern Michigan University
1401 Presque Isle Avenue
Marquette MI 49855-5341

LICENSE NUMBER

21-09119-02

DOCKET NUMBER

030-08204

LICENSE EXPIRATION DATE

August 31, 2017

A. LICENSE STATUS (Check the appropriate box)

- ☐ This license has expired. ☒ This license has not yet expired; please terminate it.

B. DISPOSAL OF RADIOACTIVE MATERIAL

(Check the appropriate boxes and complete as necessary. If additional space is needed, provide attachments)

The licensee, or any individual executing this certificate on behalf of the licensee, certifies that:

- ☐ 1. No radioactive materials have ever been procured or possessed by the licensee under this license.
- ☒ 2. All activities authorized by this license have ceased, and all radioactive materials procured and/or possessed by the licensee under this license number cited above have been disposed of in the following manner.
- ☐ a. Transfer of radioactive materials to the licensee listed below:
- ☒ b. Disposal of radioactive materials:
- ☐ 1. Directly by the licensee:
- ☒ 2. By licensed disposal site:
- Duratek Services, Inc., PO Box 2530, 1560 Bear Creek Road, Oak Ridge, TN 37831-2530
865-481-0222
- ☐ 3. By waste contractor:
- ☐ c. All radioactive materials have been removed such that any remaining residual radioactivity is within the limits of 10 CFR Part 20, Subpart E, and is ALARA.

C. SURVEYS PERFORMED AND REPORTED

- ☒ 1. A radiation survey was conducted by the licensee. The survey confirms:
- ☒ a. the absence of licensed radioactive materials
- ☐ b. that any remaining residual radioactivity is within the limits of 10 CFR 20, Subpart E, and is ALARA.
- ☒ 2. A copy of the radiation survey results:
- ☒ a. is attached; or ☐ b. is not attached (Provide explanation); or ☐ c. was forwarded to NRC on: _____ Date _____
- ☐ 3. A radiation survey is not required as only sealed sources were ever possessed under this license, and
- ☐ a. The results of the latest leak test are attached; and/or ☐ b. No leaking sources have ever been identified.

The person to be contacted regarding the information provided on this form:

NAME	TITLE	TELEPHONE (Include Area Code)	E-MAIL ADDRESS
John E. Rebers, PhD	Radiation Safety Officer	(906) 227-1585	jrebers@nmu.edu

Mail all future correspondence regarding this license to:

Dr. John Rebers, Department of Biology, Northern Michigan University, 1401 Presque Isle Avenue, Marquette MI 49855

C. CERTIFYING OFFICIAL

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT

PRINTED NAME AND TITLE

John E. Rebers, Head, Department of Biology

SIGNATURE

John E. Rebers

DATE

7/1/2015

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECT. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

Radiation Survey Results - 30 August 2013		
Sample	Area Surveyed	CPM
1	NSF 2309 Refrigerator/Freezer - left exterior	21.90
2	2309 Refrigerator/Freezer - right exterior	22.50
3	2309 Refrigerator/Freezer - top exterior	22.30
4	2309 Refrigerator/Freezer - freezer door (outside)	20.50
5	2309 Refrigerator/Freezer - refrigerator door (outside)	20.10
6	2309 Refrigerator/Freezer - inside wall, freezer (left)	20.40
7	2309 Refrigerator/Freezer - inside wall, freezer (right)	19.20
8	2309 Refrigerator/Freezer - inside freezer (bottom)	20.50
9	2309 Refrigerator/Freezer - freezer door (inside)	23.30
10	2309 Refrigerator/Freezer - refrigerator door (inside)	22.50
11	2309 Refrigerator/Freezer - left interior wall	21.60
12	2309 Refrigerator/Freezer - right interior wall	18.60
13	2309 Refrigerator/Freezer - back interior	20.50
14	2309 Refrigerator/Freezer - bottom interior	23.30
15	2309 Refrigerator/Freezer - drawer in refrigerator	24.10
16	2309 Left bench	21.70
17	2309 Center bench, left side	21.90
18	2309 Center bench, right side	22.20
19	2309 Right bench	21.30
20	2309 fume hood	23.60
21	2309, cabinet to right of hood	19.40
22	2309, cabinet to right of hood	19.60
23	2309, cabinet under right of hood, marked "corrosives"	20.40
24	2309, cabinet under right of hood, marked "corrosives"	19.30
25	Glass fiber filter + Scintiverse control	19.60
26	Scintiverse control	19.40

PAGE: 1

30 AUG 2013 11:10

ID: SWIPE

USER: 1 COMMENT: LAB MONITOR
 PRESET TIME : 10.00
 DATA CALC : CPM H# : NO SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : OFF
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

ISOTOPE 1: 14C %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	14C		LUMEX %	ELAPSED TIME
			CPM	%ERROR		
1	**1	10.00	21.20	13.74	3.30	10.37
2	**2	10.00	30.00	11.55	0.45	20.78
3	**3	10.00	42328.60	0.31	0.00	31.37
4	**4	10.00	48095.70	0.29	0.00	41.98
MISSING SAMPLE						
20	**2	10.00	21.90	13.51	1.39	52.68
21	**3	10.00	22.50	13.33	1.40	63.13
22	**4	10.00	22.30	13.39	1.33	73.58
23	**5	10.00	20.50	13.97	1.23	84.03
24	**6	10.00	20.10	14.11	1.12	94.46
25	**7	10.00	20.40	14.00	1.12	104.91
26	**8	10.00	19.20	14.43	2.42	115.36
27	**9	10.00	20.50	13.97	2.87	125.83
28	**10	10.00	23.30	13.10	0.83	136.29
29	**11	10.00	22.50	13.33	0.77	146.74
30	**12	10.00	21.60	13.61	0.83	157.19
31	**13	10.00	18.60	14.66	1.10	167.64
32	**14	10.00	20.50	13.97	1.24	178.10
33	**15	10.00	23.30	13.10	0.87	188.54
34	**16	10.00	24.10	12.88	0.76	198.99
35	**17	10.00	21.70	13.58	0.82	209.44
36	**18	10.00	21.90	13.51	0.86	219.89
37	**1	10.00	22.20	13.42	1.00	230.44
38	**2	10.00	21.30	13.70	1.04	240.89
39	**3	10.00	23.60	13.02	1.83	251.35
40	**4	10.00	19.40	14.36	0.90	261.80
41	**5	10.00	19.60	14.29	3.61	272.27
42	**6	10.00	20.40	14.00	1.74	282.73
43	**7	10.00	19.30	14.40	1.20	293.18
44	**8	10.00	19.60	14.29	1.43	303.63

-C14
H-3

INSTRUMENT CALIBRATION: Mini 27 FEB 2012 09:42
Calibration successful

Calibrating Auto DPM
Counting Standard for 14C
Calibration Complete: 14C
Counting Standard for 3H
Calibration Complete: 3H

Calibration Successful

*SAMPLES
1-18*

PAGE: 1

ID: auto dpm back
USER: 0 COMMENT:

27 FEB 2012 09:50

PRESET TIME : 10.00
DATA CALC : AUTO DPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : OFF
TWO PHASE : NO ADC : NO CYCLE REPEATS : 1
SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 1400.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	auto CPM	%ERROR	auto DPM	auto EFF-1	LUMEX %	ELAPSED TIME
1	21-1	10.00	71.2	32.70	11.06	37.47	87.27	0.51	10.50
2	21-2	10.00	83.3	32.00	11.04	40.69	80.61	2.99	21.20
3	21-3	10.00	103.6	32.70	11.06	37.68	86.79	1.31	31.99
4	21-4	10.00	116.2	34.70	10.74	43.94	78.97	1.46	42.83
5	21-5	10.00	101.2	63.40	7.94	77.74	81.55	0.52	53.51
6	21-6	10.00	81.4	32.00	11.18	35.42	90.35	0.84	64.34
7	21-7	10.00	82.1	33.10	10.99	35.59	93.02	0.78	75.05
8	21-8	10.00	101.1	30.40	11.47	34.73	87.54	1.13	85.77
9	21-9	10.00	125.7	28.60	11.83	36.23	78.94	0.75	96.57
10	21-10	10.00	97.8	31.20	11.32	39.77	78.45	1.19	107.26
11	21-11	10.00	74.6	36.60	10.45	41.33	88.56	0.76	118.05
12	21-12	10.00	79.8	29.00	11.74	32.87	88.22	0.91	128.89
13	21-13	10.00	88.8	32.20	11.15	37.07	86.85	2.52	139.61
14	21-14	10.00	84.7	30.90	11.38	38.15	81.00	2.94	150.33
15	21-15	10.00	108.6	32.30	11.13	38.68	83.50	2.25	161.17
16	21-16	10.00	68.0	32.30	11.13	37.69	85.69	0.80	171.87
17	21-17	10.00	100.9	284.10	3.75	326.37	87.05	0.64	182.75
18	21-18	10.00	94.4	59.70	8.19	68.29	87.43	1.32	193.62

INSTRUMENT CALIBRATION: Mini 27 FEB 2012 14:20
Calibration successful

Calibrating Auto DPM
Counting Standard for
Calibration Complete:
Counting Standard for
Calibration Complete:
Calibration Successful

14C - 13600 dpm
14C
3H
20 99700 dpm

04 JUNE 2008 REF
04 JUNE 2013 EXP
04 JUNE 2008 REF
04 JUNE 2013 EXP

SAMPLES
19-31

PAGE: 1

ID: auto dpm rack

27 FEB 2012 14:28

USER: 0

COMMENT:

PRESET TIME : 10.00

DATA CALC : AUTO DPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : OFF

TWO PHASE : NO ADC : NO CYCLE REPEATS : 1

SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	auto		auto	auto	LUMEX	ELAPSED
				CPM	%ERROR	DPM	EFF-1	%	TIME
1	21-19	10.00	70.6	76.00	7.25	85.88	88.50	0.41	10.65
2	21-20	10.00	98.9	100.30	6.32	132.62	75.63	1.15	21.50
3	21-21	10.00	118.5	394.50	3.18	456.63	86.39	0.38	32.36
4	21-22	10.00	100.8	288.30	3.21	452.69	85.70	0.38	42.20
5	21-23	10.00	132.0	45.50	9.38	54.03	84.22	1.37	54.02
6	21-24	10.00	104.4	53.40	8.65	67.67	78.91	1.86	64.87
7	21-25	10.00	130.0	54.00	8.54	69.31	79.06	2.55	75.73
8	21-26	10.00	73.8	33.40	10.24	38.89	80.00	0.66	86.53
9	21-27	10.00	76.1	29.60	11.62	33.62	88.04	0.44	97.34
10	21-28	10.00	105.0	32.40	11.11	38.88	83.33	2.14	108.16
11	21-29	10.00	112.2	36.70	10.44	45.09	81.39	2.91	118.90
12	21-30	10.00	137.0	34.00	10.85	40.41	84.14	1.06	129.73
13	21-31	10.00	116.4	31.30	11.30	36.35	80.10	0.55	140.40
14	21-14	10.00	-0.4	38.60	10.18	53.13	72.65	0.11	151.22

BLANK.

INSTRUMENT CALIBRATION: Mini 1 MAR 2012 14:31
Calibration successful

Calibrating Auto DPM
Counting Standard for 14C
Calibration Complete: 14C
Counting Standard for 3H
Calibration Complete: 3H
Calibration Successful

REPEAT SWIPE TEST AFTER CLEANING WITH
70% ETANOL

PAGE: 1

ID: auto dpm rack

1 MAR 2012 14:39

USER: 0 COMMENT:

PRESET TIME : 10.00

DATA CALC : AUTO DPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : OFF

TWO PHASE : NO ADC : NO CYCLE REPEATS : 1

SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	auto		auto DPM	auto EFF-1	LUMEX %	ELAPSED TIME	ROOM LOCATION
				CPM	%ERROR					
1	**1	10.00	63.9	48.10	9.12	68.64	73.28	2.41	10.68	5
2	**2	10.00	75.9	61.30	8.08	80.21	76.42	6.10	21.43	17
3	**3	10.00	78.2	44.40	9.49	59.36	74.80	4.60	32.28	18
4	**4	10.00	93.7	64.80	7.86	83.21	77.88	4.87	43.03	19
5	**5	10.00	117.6	47.00	9.23	57.63	81.56	3.64	53.87	20
6	**6	10.00	101.4	81.10	7.02	98.61	82.25	3.53	64.76	21
7	**7	10.00	83.2	63.20	7.95	81.23	77.80	3.18	75.50	22
8	**8	10.00	90.4	39.70	10.04	45.84	86.61	2.29	86.36	23
9	**9	10.00	78.9	55.10	8.52	78.91	69.83	2.16	97.23	24
10	**10	10.00	98.8	50.70	8.88	65.31	77.64	3.91	107.95	25
11	**11	10.00	-0.4	39.70	10.04	49.55	80.13	0.10	118.75	BLANK

BLANK

29 MAY 2015 12:31

CALIBRATION HISTORY

DATE	TIME	GAINS		K FACTOR	MODE	OFFSETS	
		L	R			L	R
29 MAY 2015	12:25	2549	2342	0	compton	779	735
21 FEB 2013	13:18	2487	2257	0	compton	779	735
8 MAR 2012	15:33	2458	2250	0	compton	778	734
1 MAR 2012	14:31	2452	2244	0	compton	776	731
27 FEB 2012	14:20	2442	2234	0	compton	775	731
27 FEB 2012	9:42	2448	2240	0	compton	775	731
4 AUG 2011	18:26	2459	2251	0	compton	775	731
4 AUG 2011	18:19	2473	2234	0	compton	777	733
12 AUG 2010	10:40	2436	2236	0	compton	777	733
17 SEP 2009	9:40	2392	2332	0	compton	776	732

ACTIVE KEYS

MainC	HelpC	Select		Reset
PrevC	Print	Cancel		

Press [PREV] to exit



**BECKMAN
COULTER**

Circle of Excellence

CHRISTOPHER J. MUNNICH
Senior Field Service Engineer

Beckman Coulter, Inc.
Life Sciences Division
1450 E. American Ln.
Suite 1900
Schaumburg, IL 60173

Service: (800) 369-0333
Facsimile: (866) 472-9519
cjmunnich@beckman.com

July 1, 2015

Dr. Peter Lee
Materials Licensing Section
U.S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Re: NRC license No. 21-09119-02

Dear Dr. Lee:

We wish to terminate NRC license No. 21-09119-02. A copy of NRC Form 314 and a copy of a radiation survey showing that no radiation is present in New Science Facility Room 2309 are attached.

As indicated on Form 314, all radioactive materials covered by our license have been sent to Duratek Services in Oak Ridge TN for disposal.

New Sciences Facility room 2137 (NSF 2137) was the room designated on our license for work with radioisotopes. However, this room was never used for experiments or processing radioactive materials. When we moved into the New Sciences Facility in the August, 2000, we thought we would be continuing experiments with radioisotopes and amended our license to designate NSF 2137 as our radioisotope laboratory. West Science room 51, which had been used previously for experiments with radioisotopes, was released to unrestricted use by the NRC after this move. However, NSF 2137 was only used to store radioactive materials until those materials were sent to Duratek Services for disposal.

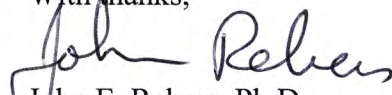
I have enclosed results of wipe tests showing that no radioactivity was detected above background in NSF 2137. I have also enclosed results from an instrument calibration showing that the liquid scintillation counter used for these wipe tests had an efficiency ranging from 72.65% to 93.02% when calibrated with ^3H and ^{14}C . A printout showing the calibration history is also enclosed.

A survey was also conducted in NSF 2309 with a Ludlum Model 3 Portable Survey Meter with Model 44-9 Pancake G-M detector. The attached sketch and photographs show the area surveyed. Benchtops and shelves directly above the benches were surveyed with the meter, with the results below. Refer to the room sketch for the area surveyed.

Area surveyed	Radioactivity (cpm)	Radioactivity (mR/hr)
Bench 1	< 60 cpm	< 0.03 mR/hr
Shelves above bench 1	< 60 cpm	< 0.03 mR/hr
Bench 2	< 60 cpm	< 0.03 mR/hr
Shelves above bench 2	< 60 cpm	< 0.03 mR/hr
Bench 3	< 60 cpm	< 0.03 mR/hr
Shelves above bench 3	< 60 cpm	< 0.03 mR/hr
Bench 4	< 60 cpm	< 0.03 mR/hr
Shelves above bench 4	< 60 cpm	< 0.03 mR/hr
Sink	< 60 cpm	< 0.03 mR/hr
Bench 5	< 60 cpm	< 0.03 mR/hr
Shelves above bench 5	< 60 cpm	< 0.03 mR/hr
Hood & cabinets below	< 60 cpm	< 0.03 mR/hr
Bench 6	< 60 cpm	< 0.03 mR/hr
Shelves above bench 6	< 60 cpm	< 0.03 mR/hr

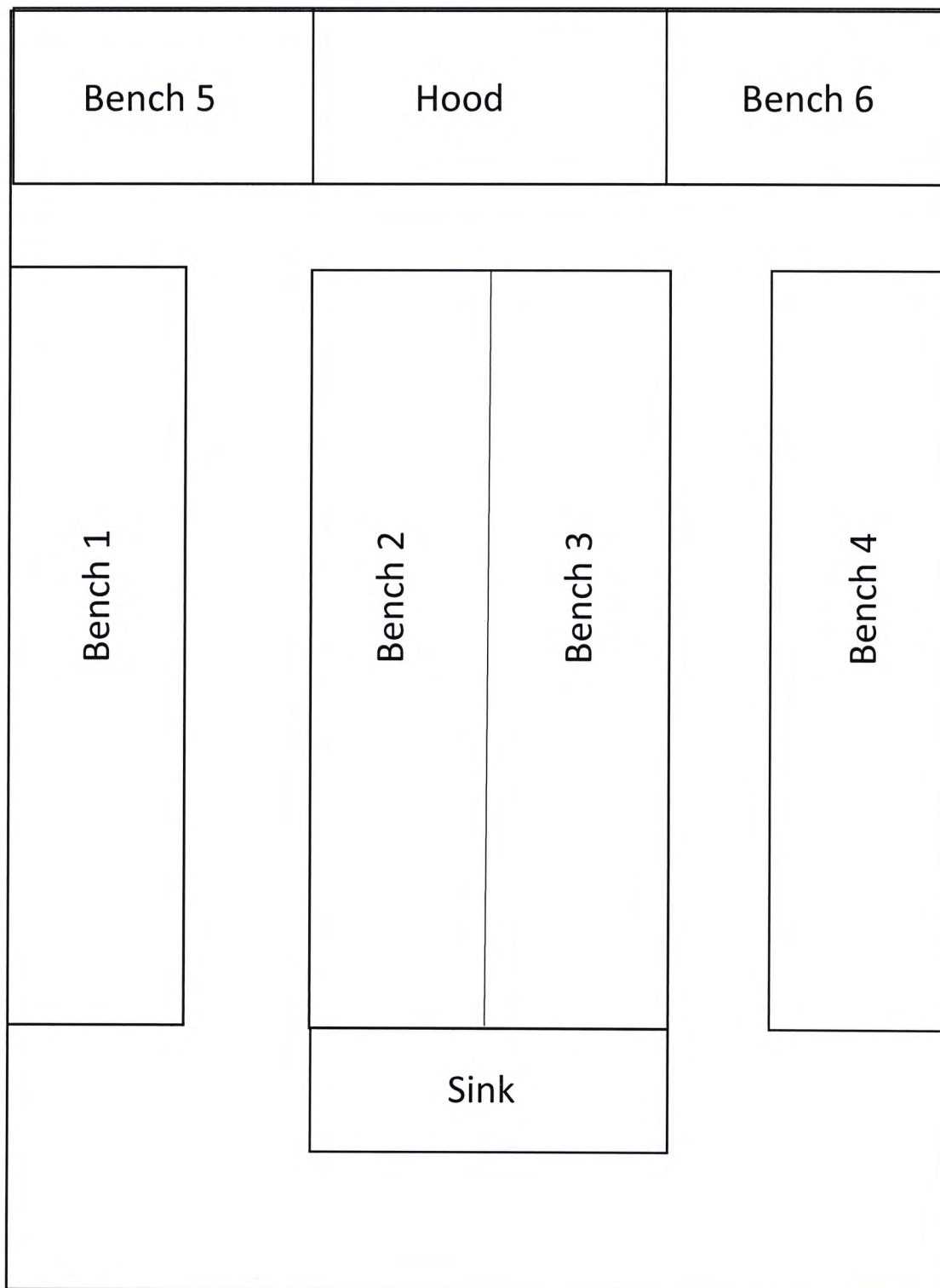
As requested, a copy of the email sent to you on May 29, 2015 is enclosed. Please let me know if any further information is needed.

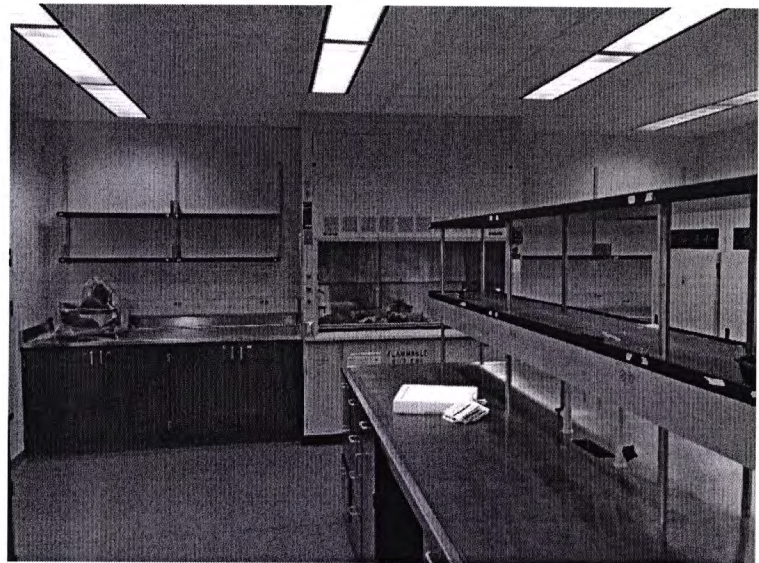
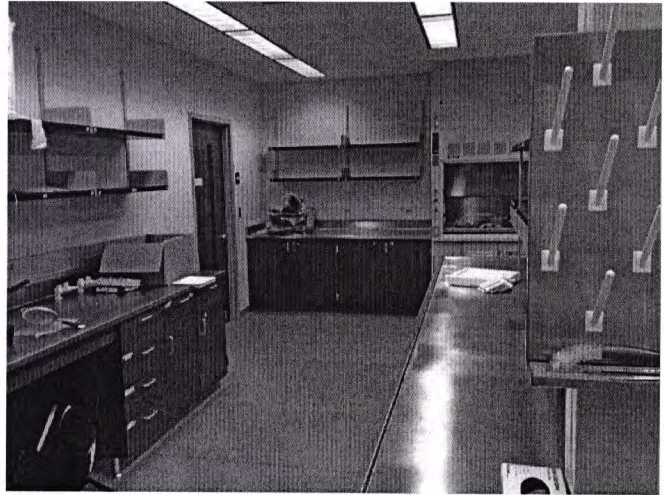
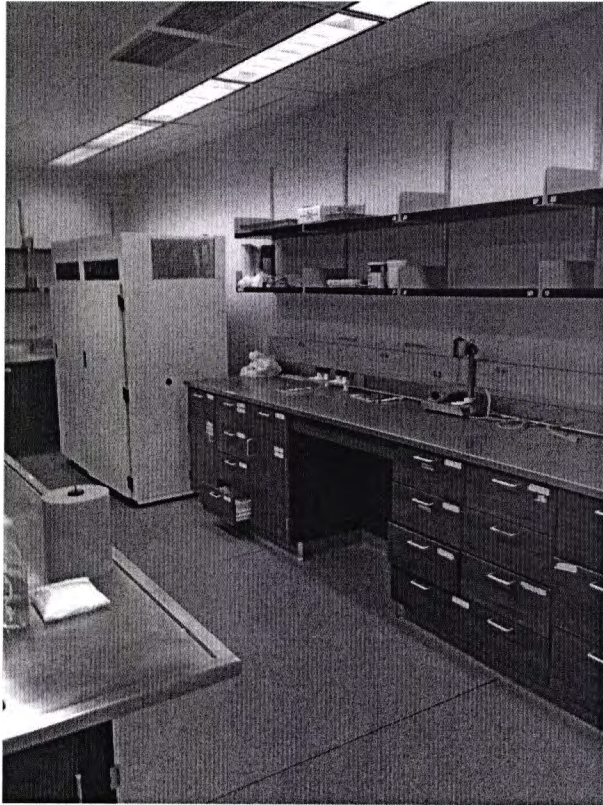
With thanks,


John E. Rebers, Ph.D.
Radiation Safety Officer

New Sciences Facility 2137

Not to scale; approximate room dimensions 6 m x 8 m





Rebers, John E

From: Rebers, John E
Sent: Friday, May 29, 2015 3:53 PM
To: 'Lee, Peter'
Subject: RE: License Termination
Attachments: LSC-SwipeTest-MTU-30August2013.pdf; NSF-2309-SurveyResults 30August2013.xlsx

Dr. Lee –

- The liquid scintillation printout used for the wipe tests that showed no detectable contamination is attached. The second page of the printout shows the calibration history of the liquid scintillation counter at Michigan Technological University that was used to count the samples. I have also attached the spreadsheet showing where the samples were taken.
- No liquid wastes were disposed of in the sink at any time in the New Sciences Facility. Therefore, we did not do a survey of the sink and associated drain line.
- There were a small number of samples of thorium and uranium held by the Chemistry Department that were sent to Energy Solutions for disposal. Some of these compounds (8 small containers of uranium sulfate, uranium nitrate, thorium nitrate) were embedded in concrete prior to being picked up for disposal. Other uranium compounds (Uranium Oxalate and 8-quinolinol complex of uranium(VI)) were in sealed containers and packed in a metal drum to be picked up by Energy Solutions. The area used to pack these materials was surveyed with a survey meter before and after packing the materials for disposal and showed no contamination prior to, during, or after packing the materials.

Please let me know if you need any further information.

Thanks,

John Rebers
Head, Department of Biology
Northern Michigan University
1401 Presque Isle Avenue
Marquette, MI 49855

jrebers@nmu.edu
906-227-1585
906-227-1063 (FAX)

From: Lee, Peter [mailto:Peter.Lee@nrc.gov]
Sent: Tuesday, May 26, 2015 5:13 PM
To: jrebers@nmu.edu
Subject: License Termination

Dr. Rebers,

To complete the review of your license termination request, I need the following information:

1. LSC efficiency calibration.

2. Survey of sink and associated drain line If the liquid wastes being disposed to the sanitary sewer.
3. Potential contamination of generally licensed materials of thorium and uranium.

If you have any question, please let me know. You can reach me at 630-829-9870.

Peter J. Lee, Ph.D., CHP



Rebers - Biology

Northern
Michigan
University

1401 Presque Isle Avenue
Marquette, MI 49855-5301



U.S. POSTAGE >> PITNEY BOWES



ZIP 49855 \$001.42⁰
02 1W
0001385904 JUL 02 2015

Dr. Peter Lee
Materials Licensing Section
U. S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532

