Boone Hospital Center

BJC HealthCare℠

1600 East Broadway
Columbia, Missouri 65201
(573) 815-8000

DATE and TIME: Oct 30, 2007 8:00 A.M.

TO: Bill Reichhold

DEPT: US NRC

PHONE: (630) 829-9839

FAX: (630) 515-1078 / (630) 829-9782

FROM: Liesje Myers, RSO

DEPT: Boone Hospital Nuclear Medicine Department

PHONE: (573) 815-3388 or (573) 815-3729

FAX: (573) 815-3750

8 PAGES TRANSMITTED INCLUDING THIS PAGE

COMMENTS:

Thank You for your attention (& patience!) to our License amendment request. I hope this will complete what is necessary to decomission Boone's 'old' department for unrestricted use. Then... we can work on closing out Fitzgibbon as they get their own License ... simultaneously :)

Boone Hospital Center

1600 East Broadway
Columbia, Missouri 65201
Phone: 573 815 8000

October 29, 2007

US Nuclear Regulatory Commission
Materials Licensing Section
2443 Warrenville Road Suite 210
Lisle, IL 60532-4352

License Number: 24-01565-01

Additional Information Requested to Authorize Release of "old" Nuclear Medicine Department at Boone Hospital Center, Columbia, Missouri

Dear Mr. Reichhold,

Enclosed are the close-out surveys for the two imaging (camera) rooms and the stress room located in our "old" Nuclear Medicine department. Exposure rate measurements were performed to show that all sources of radioactive material were removed. Wipe tests of the floors & counter-tops were also performed to detect any removable contamination. Radiation levels in the stress room and both "old" imaging (camera) rooms were at- or below- background levels . All wipe counts were below the acceptable surface contamination levels , per Table 1, of the decommissioning guidelines.

Also enclosed is a history of radionuclides used in our "old" department. I hope this provides the required information.

Boone Hospital has no history of any leaking sealed sources. Leak tests are performed in accordance with 10CFR35.67. Records of leak tests are retained in accordance with 10CFR35.20678 (a).

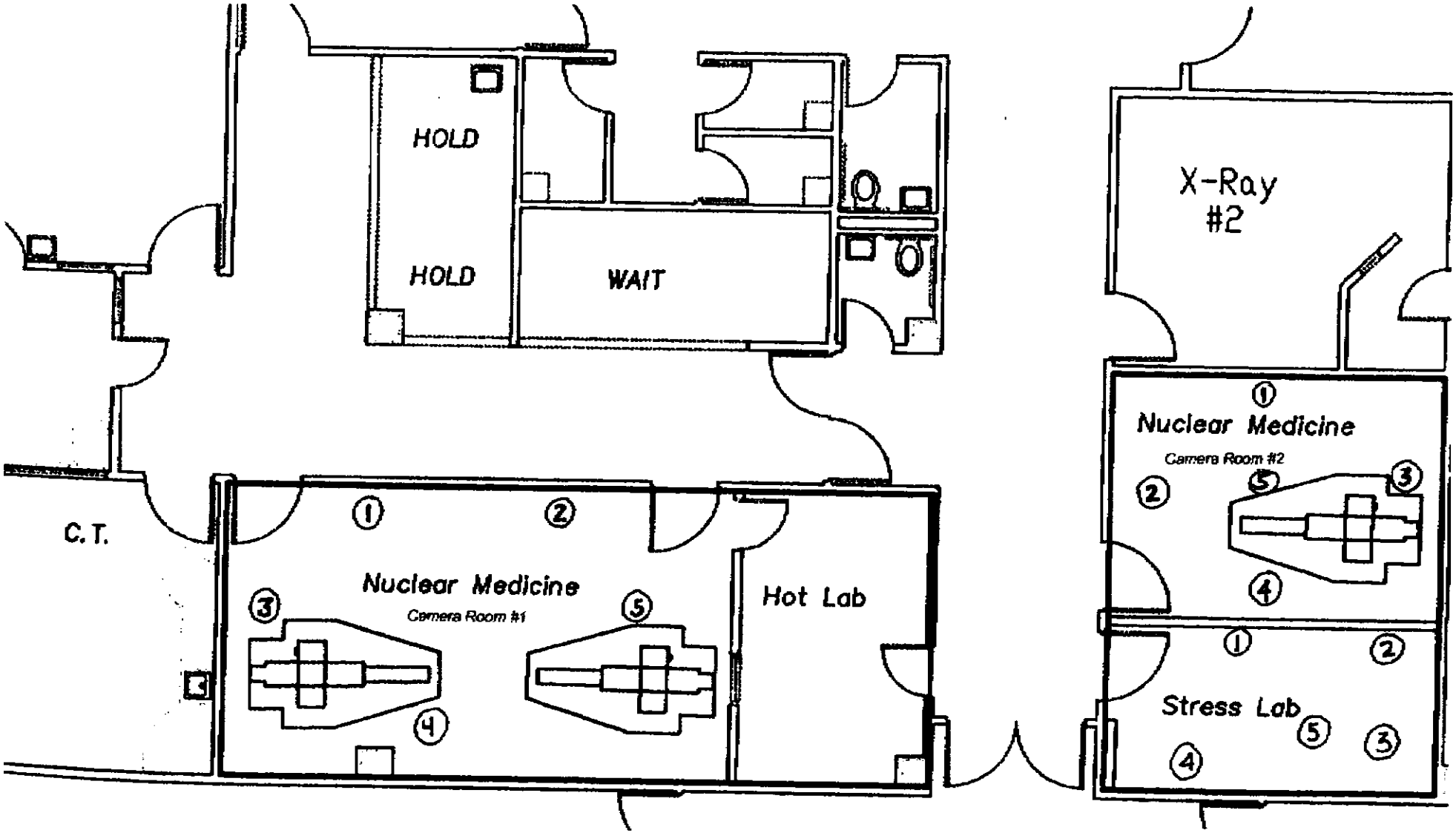
Please review the close-out surveys and the radionuclide history for completeness. Contact me if any additional information is needed in order to release our "old" facility for unrestricted use.

Sincere Thanks,

Liesje Myers

Liesje Myers, CNMT
Radiation Safety Officer

Enclosures:
Diagram of "old" Nuclear Medicine Dep (Camera Room #1, Camera Room #2, Stress Room)
Exposure Rate Measurements for "old" Camera Room #1, Camera Room #2, and Stress Room
Wipe Test Results for Removable Contamination (Camera Room #1, #2, and Stress Room)
Wipe/Well Counter Identification, Settings, and Calibration Data
History of Radionuclides used in "old" Nuclear Medicine Department



Boone Hospital Nuclear Medicine Department
Location until June 2007
Scale 1/16" = 1'0

N

CLOSE-OUT SURVEY

Boone Hospital
Nuclear Medicine Department ("old" facility)
1600 East Broadway
Columbia, Missouri 65201

Exposure Rate Measurements - Camera Room #1 (LL1327)

Location Surveyed (See diagram)	Description	Radiation Levels at 1 meter from surface
1	Sink	.00004 mSv/hr
2	Counter	.00003 mSv/hr
3	West Floor	.00004 mSv/hr
4	South Floor	.00002 mSv/hr
5	East Floor	.00002 mSv/hr
Background		.00003 mSv/hr

Results: **All areas surveyed were at or below background radiation level**

Exposure Rate Measurements- Camera Room #2 (LL1334)

Location Surveyed (See diagram)	Description	Radiation Levels at 1 meter from surface
1	North Floor	.00003 mSv/hr
2	West Floor	.00003 mSv/hr
3	East Floor	.00004 mSv/hr
4	South Floor	.00003 mSv/hr
5	Central floor	.00002 mSv/hr
Background		.00003 mSv/hr

Results: **All areas surveyed were at or below background radiation level**

Exposure Rate Measurements- Stress Room (LL1333)

Location Surveyed (See diagram)	Description	Radiation Levels at 1 meter from surface
1	North Floor	.00002 mSv/hr
2	Sink	.00003 mSv/hr
3	East Floor	.00002 mSv/hr
4	South/West Floor	.00003 mSv/hr
5	Central floor	.00004 mSv/hr
Background		.00004 mSv/hr

Results: **All areas surveyed were at or below background radiation level**

Name of Individual Performing Surveys	Liesje Myers, Radiation Safety Officer
Date survey was performed	October 29, 2007
Survey Meter used for measurements	Ludlum GM Model 3 (SN# 163350)
Date of survey meter calibration	February 13, 2007

CLOSE-OUT SURVEY (continued)

Boone Hospital
Nuclear Medicine Department ("old" facility)
1600 East Broadway
Columbia, Missouri 65201

Removable Contamination Check - Camera Room #1 (LL1327)

Location Wiped (See diagram)	Bkgd (cpm)	Wipe* (cpm)	Net (cpm)	Corrected Net (dpm)	Activity (microcuries)
1	127	101	< bkgd	< bkgd	< bkgd
2	127	121	< bkgd	< bkgd	< bkgd
3	127	144	17	51	.0000232
4	127	128	1	3	.0000013
5	127	132	5	15	.0000068

*Note: All wipes are per 100 square centimeters of surface area wiped
Results: All wipe counts were below limits specified in NRC Decontamination Guide Table 1

Removable Contamination Check - Camera Room #2 (LL1334)

Location Wiped (See diagram)	Bkgd (cpm)	Wipe* (cpm)	Net (cpm)	Corrected Net (dpm)	Activity (microcuries)
1	127	118	< bkgd	< bkgd	< bkgrd
2	127	110	< bkgd	< bkgd	< bkgd
3	127	135	8	24	.000011
4	127	142	15	45	.000020
5	127	120	< bkgd	< bkgd	< bkgd

*Note : All wipes are per 100 square centimeters of surface area wiped
Results: All wipe counts were below limits specified in NRC Decontamination Guide Table 1

Removable Contamination Check - Stress Room (LL1333)

Location Wiped (See diagram)	Bkgd (cpm)	Wipe* (cpm)	Net (cpm)	Corrected Net (dpm)	Activity (microcuries)
1	127	142	15	45	.000020
2	127	136	9	27	.000012
3	127	110	< bkgd	< bkgd	< bkgd
4	127	114	< bkgd	< bkgd	< bkgd
5	127	140	13	39	.000018

*Note : All wipes are per 100 square centimeters of surface area wiped
Results: **All wipe counts were below limits specified in NRC Decontamination Guide Table 1**

Wipe/Well Counter Identification & Settings

Detector: Capintec Scintillation Well Counter
Model CAPRAC
Serial Number 1798
Window Setting open

WipeWell Counter Calibration Data (performed June 5, 2007)

Source Description	Serial #	Calibration Date	Activity(uCi)	Current Activity(uCi)	Current Activity (dpm)	(cpm)	Bkgrd (cpm)	Counts	Net (cpm)	
Cs-137 rod	3411 MR	12/1/1989	0.1	0.066731	148143		109		49630	49521

Well Counter Efficiency = $\frac{\text{net cpm}}{\text{calculated dpm}} = \frac{49521}{148143} =$ 33.4 %

Name of Individual Performing Wipe Tests Liesje Myers, Radiation Safety Officer
Date wipes were performed October 29, 2007

History of NRC Licensed Byproduct Material Utilized at Boone Hospital 'old" Nuclear Medicine Department

Licensed Diagnostic Radionuclides

Tc-99m
- gamma emitter (140 keV) with 6.5 h half-life
- used for most all diagnostic patient studies performed in the department
- received Tc-99m labeled radiopharmaceuticals in unit doses from local radiopharmacy
- doses kept in lead pigs behind L-block until injection, lead syringes used during injections
- doses administered in hot lab & stress room (seldom in imaging rooms)
- waste held for decay in storage room for 10 half-lives (or when readings are at background level)
- no history of major spills of Tc-99m

Xe-133
- gas, gamma emitter (81 keV), 5.3 d half-life
- used for lung ventilation studies by patient inhalation
- received vials of Xe-133 from radiopharmacy, vials stored in lead shield in hot lab
- gas drawn up in syringes from vial for individual patient doses
- doses drawn up in ventilation hood in hot lab
- exams performed only in room with negative ventilation using a xenon trap with charcoal filter
- waste held for decay for 10 half-lives (or when readings are at background level)

Licensed Therapeutic Radionuclides

I-131 Sodium Iodide
- beta emitter (.61 meV max) and gamma emitter (365 keV), 8.0 d half-life
- used for thyroid ablation to treat hyperthyroidism and thyroid cancer
- receive I-131 in solid form in a gelatin capsule from radiopharmacy
- capsules stored in vented hood until administration
- doses administered (orally) in hot lab only
  patients released if allowable per regulatory guide 8.39
- any waste held for decay in storage room
- no history of I-131 spills or mis-administrations

I-131 tositumomab (Bexxar)
- beta emitter (.61 meV max) and gamma emitter (365 keV), 8.0 d half-life
- used for treatment of non-Hodgkins Lymphoma
- receive I-131 in liquid form from radiopharmacy
- I-131 Bexxar stored in vented hood in lead pig until administration
- doses administered intravenously in hot lab only
- patients released if allowable per regulatory guide 8.39
- any waste held for decay in storage room
- no history of I-131 spills or mis-administrations

***Licensed Therapeutic Radionuclides* (con't)**

Y-90 Ibritumomab tiuxetan (Zevalin)
- beta emitter (2.2 meV max) , 2.7 d half-life
- used for treatment of non-Hodgkins Lymphoma
- receive Y-90 in liquid form from radiopharmacy
- Y-90 Zevalin stored in lead pig until administration
- doses administered intravenously in hot lab only
- patients released if allowable per regulatory guide 8.39
- any waste held for decay in storage room
- no history of Y-90 spills or mis-administrations

Sm-153 Lexidronam (Quadramet)
- beta emitter (810 keV max), 43.6 h half-life
- used for bone pain palliation in patients with metastatic bone cancer
- received as a liquid in individualized patient doses from radiopharmacy
- lucite/plastic shielding utilized to shield beta emissions
- doses administered in hot lab intravenously
- patients released as outpatients
- waste held for decay in storage room
- no history of Sm-153 spills or mis-administrations

Sr-89 Chloride (Metastron)
- beta emitter (1.46 meV max), 50.5 d half-life
- used for bone pain palliation in patients with metastatic bone cancer
- received in individualized patient doses from radiopharmacy
- lucite/plastic shielding utilized to shield beta emissions
- doses administered in hot lab intravenously
- patients released as outpatients
- waste held for decay in storage room
- no history of Sr-90 spills or mis-administrations

Licensed Material Used for Calibration, QC, and attenuation correction

Cs-137
- gamma emitter (662 keV), 30y half-life
- used only as sealed sources for camera calibration, QC, and attenuation correction
- sealed sources secured behind lead shielding in hot lab or storage room
- no history of any leaking Cs-137 sealed sources
- amount of Cs-137 we possess is less than NRC quantity of concern

Co-60
- used only as sealed sources for dose calibrator accuracy (NIST standard)
- sealed sources secured behind lead shielding in hot lab or storage room
- no history of any leaking Co-60 sealed sources
- amount of Co-60 we possess is less than NRC quantity of concern