University of Connecticut Health Center

Office of Research Safety

May 7, 2012

United States Nuclear Regulatory Commission
Region I DNMS
2100 Renaissance Blvd.
King of Prussia, PA 19406

Br. 1

Attn: Sandra Gabriel, Ph.D.

License # 06-13022-02
Docket # 030-01295

Dear Dr. Gabriel:

The University of Connecticut Health Center is requesting that the radioactive waste storage facility, Building 27, be removed from the license. A letter dated January 16, 1992, requested that Building 27 be added to the license and this was approved in Amendment 30, dated September 17, 1992. The intent is to demolish this building for new construction. Please find attached a formal decommissioning report entitled "Final Report Concerning the Decommissioning of Building 27, Radioactive Waste Storage Facility, University of Connecticut Health Center". It should be noted that the decommissioning DCGL values were chosen for a 19 mrem/yr dose equivalent rather than the 25 mrem/yr value as required by NRC. This was done to satisfy the State of Connecticut's decommissioning criteria.

Due to pending contractual agreements, the University of Connecticut Health Center requests and expedited review of this submission. If you require further information please contact Mr. Kenneth Price (860-679-2250), the UCHC Radiation Safety Officer. Thank you for your consideration of this request.

Sincerely,

Leonard Paplauskas
Associate Vice President for Research
Administration, Emeritus

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FINAL REPORT CONCERNING THE DECOMMISSIONING OF BUILDING 27, RADIOACTIVE WASTE STORAGE FACILITY UNIVERSITY OF CONNECTICT HEALT CENTER

(5/7/2012)

Introduction

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) established a series of milestones, penalties and incentives to ensure that State or Regional Compacts make adequate progress toward being able to manage their LLW by 1993. NRC Informational Notice No. 90-09 stated that by January 1, 1993, the existing LLW disposal sites are expected to either close or stop receiving waste from outside their compacts. The State of Connecticut attempted to establish a low level radioactive waste site in-State. This option did not seem likely. The University of Connecticut Health Center began making plans to construct a radioactive waste long term storage facility (Environmental Health Facility, Building 27) capable of storing waste for up to 10 years. Construction of this 9,200 square feet building began May 30, 1992 with a planned occupancy date of January 1, 1993. An amendment request was submitted to the NRC, dated January 16, 1992, to authorize long term storage of radioactive waste along with a description of the facility to be built. Amendment 30 included the long term storage provision. Building 27 was put into service and radioactive waste has been received, processed, packaged and shipped from this building through February 10. 2012.

Recently, the Governor of the State of Connecticut executed an agreement with the Jackson Laboratories (Maine) to build a research facility on the campus of the University of Connecticut Health Center. Unfortunately, the footprint of this proposed building lays over the existing Building 27. Therefore, Building 27 will be demolished to make way for new construction. The University of Connecticut Health Center's Office of Radiation Safety will decommission this facility using the information provided in NUREG-1757, Vol. 1, as a Group 2 facility and information from Draft NUREG CR/5512. The information that follows provides documentation of this decommissioning effort.

Description of Building 27 (Environmental Health Facility)

Building 27 is a two and one half story facility. The ground level and the first half level are shown in figure 1. Areas A and E are at ground level and the remaining areas in Figure 1 are approximately 6 feet above Area A. Areas B and C are open two stories to the roof. Areas F, G and H are one story with a roof above. Areas B, C, F, G and H are on the same level. The second floor shown in figure 2 is located primarily above Area A. Access to all levels is by stair or elevator (Area D). Floors are poured concrete with epoxy covering and all floor drains are sealed. Each area's use was as follows:

Area A	This room was used to store dry radioactive waste that was packaged in plastic bags at another location and then placed into 67 gallon heavy duty cardboard containers. A waste sorting table was located in this room to inspect decayed radioactive waste prior to disposal as regular trash. The floor is poured concrete and epoxy coated. There are no floor drains in this area.
Area B	This area was used for storage and packaging of mixed liquid waste, in addition to handling non-radioactive hazardous waste. Liquids were stored on secondary containment. Mixed liquids were contained in plastic 1 gallon jugs. The floor is poured concrete with a 6 inch berm perimeter, and the floor has an epoxy coating. There are no floor drains in this area.
Area C	Liquid radioactive waste was stored on racks in this area. Liquids were contained in 1 gallon plastic jugs and were stored on secondary containment trays. Limited drain disposal occurred in this area as well as compaction of dry waste for shipment. Waste was handled in Areas C1, C2, and C3 all of which are poured concrete and bermed. The floor is poured concrete with an epoxy coating. The floor drain is sealed.
Area D	This is an elevator used to move dry waste into area A or animal waste upstairs to Area I. Materials moved in this elevator were contained and consisted of frozen animals for storage in freezers located in Area I or packaged dry waste to be stored for radioactive decay in Area A. Liquids transported in the elevator were ready for shipment and packaged according to DOT shipping criteria..
Area E	This is an elevator closet and has no likelihood of containing contamination.
Area F	Area F was the room where radioactive waste from laboratory and medical operations were initially brought into the building. Waste was sorted here by radionuclide and moved to other areas of the building. Incoming materials were off loaded from a vehicle and an outside lift used to raise the load to the second level. Containerized waste was placed on a stainless steel sorting table for processing and placement into storage. The floor is poured concrete and is epoxy coated. The floor drain is sealed. .

Area G	This was an electrical closet and not used by the staff. No radioactive contamination is possible in this area.
Area H	This was mainly used as a supply area. Sealed liquid scintillation vial drums were stored here as well as sealed sources. No active waste processing occurred in this area. The floor is poured concrete with an epoxy coating. There are no floor drains in this aera.
Area I	This area is located on the top floor and was always accessed using the elevator. Several freezers were stored here that accumulated frozen animals and waste from patient rooms stored for decay. All waste brought into this area was prepackaged. Liquid radioactive waste was never brought into this area and no processing was done in this area. This floor is poured concrete and is epoxy coated and bermed. The floor drain is sealed.
Area J	This area is adjacent to Area I and was used solely for equipment storage and a 137-Cs sealed calibration source. Area J was used for instrument calibrations and the presence of radioactive contamination in this area is unlikely. The floor is poured concrete with an epoxy coating and is bermed. Two floor drains in this area are sealed.
Area K	This room housed a sealed HEPA/Charcoal filtering system for the building exhaust. No radioactive materials were ever brought into this room. It was also used for records storage. The likelihood of this area being contaminated is remote.
Area L	This was an office area and was posted "No Radioactive Materials Allowed". The likelihood of this office being contaminated is remote.
Area M	This was the counting room. This room housed a liquid scintillation counter and air filter monitoring equipment. It was a low level counting lab and the presence of radioactive contamination here is remote.
Area N	This is a janitor's closet and is not contaminated.
Area O	This was a hallway used to access Area I and Area M. The likelihood of radioactive contamination is minimal.

General	Areas K, L and M are adjacent to an open space to the floor below and roof above. The rest rooms and stairwells should not have any radioactive contamination present. Radioactive waste was picked up for disposal using the lift just outside of Area F. The ramp into Area F was not used for radioactive waste processing.

Building 27 Operational History

Radioactive liquid and solid waste storage in Building 27 began during March, 1993 and continued through February, 2012. Solid radioactive waste entering the building was inside of plastic bags, and those bags inside of 5 gallon pails or 30 gallon steel drums. Liquid waste was brought into the building contained in 1 gallon plastic capped containers placed inside secondary containment containers. All items, either bags or bottles, were uniquely tagged and waste contents entered into a computer database. Therefore, records exist for all waste brought into the facility. Bags and jugs were wipe tested in the receiving area (see Area F on figure 1), deconned or rebagged if necessary, and placed into storage. Liquids were placed onto racks, in secondary containment, for decay in storage or disposal. These racks were located in Area C of figure 1 within a bermed area. Mixed waste was stored in a similar manner in Area B, figure 1. Solid radioactive waste was stored for decay inside of 67 gallon fiberboard containers located in Area A, figure 1. Long lived dry waste was packaged and readied for disposal by a vendor. This was done in Area F and stored in Area A Compaction of long lived dry waste was done for several years in Area C, figure 1. Liquid scintillation vials were accumulated in 55 gallon drums in Area C, figure 1, until full. Once these 55 gallon drums were full, they were sealed, made ready for transport and stored in Area H, figure 1. Frozen animal carcasses were stored in freezers located in Area I, figure 2. Environmentally safe liquids were disposed into the sanitary sewerage system using the sink located in Area C, figure 1, from 1994 through 2004. Contaminated regulated medical waste originating from patient activities was also stored in Building 27 for decay in storage. These containers were stored in Area A, figure 1, and consisted of short lived medical radionuclides such as 131-I, 99m-Tc, 111-In and 201-Tl.

Provided in Table 1 is a complete list of radionuclides ever brought into Building 27, their half lives and the last date on which that radionuclide entered the building and the quantity. It should be noted that all 238-U entering the building was uranyl nitrate and uranyl acetate purchased as a chemical product. Radionuclides brought into the building as sealed sources only were 133-Ba, 137-Cs, 226-Ra, 241-Am and 99-Tc. These sources all have documented leak test histories and have not indicated any leakage as determined by sealed source leak tests. Table 2 below summarizes all liquid disposals into the sanitary sewer made from 1994 through 2004 in Building 27.

Table 1

University of Connecticut Health Center
Office of Radiation Safety

Last In Radioactive Waste Summary - All

Radionuclide	Last Activity In (mCi)	Last Recorded Date for Radionuclide	Half Life in Days
109-CD	.380000	Tuesday, July 27, 1999	464.00
111-IN	.002800	Tuesday, May 10, 2011	2.83
113-SN	.000500	Thursday, December 02, 1993	115.10
114M-IN	.001000	Sunday, June 03, 2001	49.51
123-I	1.000000	Friday, January 28, 2011	0.55
125-I	.010000	Friday, January 13, 2012	60.14
131-I	1.000000	Thursday, December 08, 2011	8.04
133-BA	.009000	Tuesday, October 11, 2011	3,922.79
137-CS	.030000	Monday, October 17, 2011	10,957.50
14-C	.200000	Friday, December 16, 2011	2,092,882.50
153-GD	.000940	Thursday, December 26, 1991	242.00
153-SM	.001500	Thursday, November 06, 2008	1.95
201-TL	.090000	Thursday, October 20, 2011	3.04
203-HG	.001000	Thursday, June 30, 1994	46.60
22-NA	.000100	Wednesday, December 12, 2001	950.38
226-RA	.010000	Wednesday, October 12, 2011	584,400.00
238-U	.025000	Monday, December 11, 2006	1,631,900,000,000.00
241-AM	.031500	Wednesday, March 29, 1995	157,861.05
3-H	.000100	Friday, January 20, 2012	4,510.84
32-P	.001000	Saturday, February 18, 2012	14.29
33-P	.250000	Tuesday, June 21, 2011	25.40
35-S	.001000	Saturday, February 25, 2012	87.44
36-CL	.200000	Friday, November 30, 2007	109,940,250.00
45-CA	.000100	Thursday, June 09, 2011	163.00
46-SC	.001000	Sunday, September 27, 1998	83.83
51-CR	.010000	Friday, December 09, 2011	27.70
54-MN	.001000	Friday, October 26, 2001	312.50

University of Connecticut Health Center
Office of Radiation Safety

Last In Radioactive Waste Summary - All

Radionuclide	Last Activity In (mCi)	Last Recorded Date for Radionuclide	Half Life in Days
55-FE	.200000	Friday, January 08, 1999	986.18
57-CO	.150000	Wednesday, May 28, 2008	270.90
58-CO	.000100	Saturday, March 05, 1994	70.80
59-FE	.001000	Friday, November 12, 1993	44.53
63-NI	.020000	Tuesday, March 23, 2004	35,064.00
65-ZN	.010000	Wednesday, January 01, 2003	243.90
67-GA	.001800	Thursday, December 15, 2011	3.26
86-RB	14.000000	Monday, November 01, 1993	18.66
89-SR	.001000	Tuesday, January 21, 1997	50.50
90-Y	.001000	Wednesday, October 05, 2005	2.67
95-NB	.002300	Thursday, December 02, 1993	35.15
99-MO	0.000000	Monday, December 15, 1997	2.75
99-TC	0.000000	Thursday, July 20, 2006	77,819,550.00
99M-TC	.006000	Friday, January 20, 2012	0.25

Table 2
Liquid Disposals
1994-2004

Radionuclide	Total Activity, mCi
3-H	126.0
14-C	4.1
36-Cl	1.7
32-P	0.31
45-Ca	0.31
33-P	0.015
125-I	0.014
54-Mn	0.006
35-S	0.003
Remainder	<0.001 each

Radioactive waste storage areas were inspected on a weekly basis for leakage and package integrity. These inspections are documented with any problems noted. Table 3 summarizes all leaks of containers noted during the period 1993 through 2012.

Table 3
CONTAINER INSPECTIONS

Inspection Date	Location	Description	Floor Contam?
3/24/94	Area C1	5 gal.container	yes, deconned
7/8/94	Area C1	liquid on floor	yes, deconned
9/9/94	Area B	3-H mixed liquid	no
9/30/94	Area B	mixed liquid	no
11/11/94	Area B	mixed liquid	no
1/13/95	Area B	mixed liquid	no
4/27/95	Area C1	3-H, 1 gal. container	yes, deconned
7/21/95	Area B	mixed 1 gal. container	no
8/1/96	Area C1	32-P 1 gal container	no
11/7/97	Area C1	1 gal. container	no
5/25/00	Area C1	32-P, 1 gal. container	no
3/8/06	Area C1	1 gal. container	no

The above table summarizes all recorded leaking containers for the period.

There were no major spills or leaks recorded due to the fact that liquids were stored within secondary holding trays.

Radiological Contamination History

Weekly wipe test and meter surveys were conducted in Building 27 from beginning of service through February, 2012. Any contamination detected was immediately decontaminated. Individuals leaving the facility were required to survey their hands and shoes prior to exiting. No contamination was detected during these exit surveys, all of which are documented. Summarized in Table 4 are recorded positive survey results that exceeded 100 dpm/100cm^2 throughout the operating life of Building 27. .

Table 4
WIPE TEST SURVEY HISTORY OF
RESULTS EXCEEDING 100 DPM/100CM^2

Date	*Location	Detail	Value, dpm/100cm^2
7/23/93	C1	3-H on floor	217
2/17/94	K	3-H on floor	150
5/20/94	B	14-C,35-S,floor	215
7/27/94	C2	3-H, sink	147
4/21/95	M	3-H, lab bench top	112
6/9/95	B	3-H, floor	116
7/21/95	C2	3-H, sink	825
1/19/96	B	3-H, floor	207
4/20/96	A	3-H, sort table	125
5/31/96	F	3-H, sort table	1258
5/10/96	C1	3-H, floor	116
5/23/97	C2	3-H, sink	143
8/22/97	C2	35-S, sink	208
10/23/98	C3	14-C, sink	1007
2/11/00	C1	3-H, shelves	646
6/22/01	C2	sink	125
1/11/02	G	floor	396
1/28/05	C1	3-H, floor	125
2/25/05	H	3-H, floor	121
2/24/06	G	3-H, floor	712
9/8/06	L	3-H, desk	142
12/1/06	L	3-H, table	138
7/10/07	C2	14-C, floor	338
2008		missing data	

* Locations as indicated in figures 1 and 2.

The maximum floor contamination result was 712 dpm/100 cm^2 of 3-H near Area G of figure 1. These areas were decontaminated.

Radiation Detection Instruments Used for Building Surveys

Three types of radiation detection instrumentation were used in performing the building surveys. A GM pancake probe and appropriate meter was used for surface contamination measurements, confined to walls and items. A gas flow proportional floor monitor was used to determine contamination levels on the floors. A Tri-Carb liquid scintillation counter was used for analysis of wipe tests of all accessible building surfaces. Ludlum Model 44-9 and 44-9-18 pancake probes were used with Model 3 survey meters for surface contamination measurements. Based upon the operating history of the facility, it was determined that beta and gamma radiation must be detectable. The pancake probes were calibrated on all scales (for linearity purposes) using a 137-Cs source for which exposure rates were known. After the gamma calibration, a set of beta standards were used to determine the efficiency of the pancake probes versus beta energy. A Ludlum Model 239-1F gas flow proportional floor monitor with a model 43-37 probe with a of 737.9 cm^2 window was calibrated as above to detect beta and gamma radiation at a 4mm detector to floor distance. Ambient gamma radiation exposure rates were measured with Ludlum Model 9 micro-R chambers. These instruments were calibrated with the 137-Cs source mentioned above. Analysis of wipe tests was done using Packard Tri-Carb models 1600CA and 2300TR liquid scintillation counters with internal standards. These units were calibrated using sets of 3-H, 14-C and 36-Cl sealed standards.

Counting efficiencies for radionuclides for which no standard was available were determined by analysis of radioactive decay schemes and approximating the value from the known efficiencies. Care was taken not to overestimate the counting efficiencies. This was done for all instruments used in the building surface surveys.

Scan and Wipe Test MDC's

The information provided in the MARSSIM manual (NUREG-1575) was utilized to determine decisions levels and minimum detectable activities.

For a survey meter, the minimum detectable count rate (MDCR) is

MDCR = d'x SQRT(Br*T)/ T cpm, where

T = observation interval, default used, 0.0167 min (1 second)

d'= index of sensitivity, default =2

Br=background, cpm .

DL = Br + MDCR cpm,

Where DL is the decision level for the surveyor.

The MDCR was used as a decision level to determine if surface contamination above background exists. Using the MDCR, the minimum detectable concentration (MDC) can be determined as follows:

$$MDC = \frac{MDCR}{SQRT(Ehf) * Ei * Es * A * C} \quad dpm/cm^2$$

Where Ehf = human efficiency factor, default = 0.65

Ei = counting efficiency for radionuclide, cpm/dpm

Es = source efficiency, =1

A = probe area, cm^2

C = appropriate constant = 1

For the analysis of wipe tests, the decision level for determining if a wipe contains radioactivity,

$$Lc = 2.33 * SQRT(B) \text{ counts,}$$

Where B = the background count in 1 minute.

Then Ld = B + Lc counts.

The minimum detectable removable activity on a wipe test is

$$MDC = \frac{3 + 4.65 * SQRT(B)}{T * Et * A * C} \quad dpm/cm^2$$

Where T = count time, minutes (1 min)

Et = radionuclide efficiency, counts/disintegration

A = wipe test area, cm^2 , 100 cm^2.

Minimum detectable concentrations of the radionuclides of concern are provided in Table 5, based on the above equations and counting efficiencies estimated for each radionuclide. Also included in table 5 are the DCGL values determined for each radionuclide. It is assumed that a wipe removes 10% of the surface activity.

Decommissioning Group Determination –NUREG-1757, Vol. 1

The radionuclides listed in Table 1 were at some point brought into Building 27 either in liquid or dry form. This list was reduced by noting the time interval between the last date a specific radionuclide was brought into the building and February 1, 2012. Based on the weekly survey history and the weekly container inspections, the list provided in table 5 was developed to identify possible contaminants that may be present as of February 1, 2012. The radionuclides of potential concern are then reduced to those provided in table 5. The DCGL values were either obtained from NUREG/CR-5512 or were calculated using D&D version 2.1.0. An annual total effective dose equivalent of 19 mrem/year was used in determining the DCGL values (instead of NRC's 25 mrem/yr). This was done due to the more restrictive release criteria of the Connecticut Department of Energy and Environmental Protection's yearly limit of 19 mrem/yr.

Table 5
Possible Radioactive Contaminants Present
Building 27

DPM/100CM^2

Radionuclide	19 mrem/yr DCGL*	PANCAKE MDC	FLOOR MON. MDC	WIPE TEST MDC
109-Cd	8.70E+04	3.20E+04	2.40E-03	2.84E+02
125-I	5.00E+05#	2.26E+05	1.53E-04	1.22E+03
14-C	2.80E+06	3.20E+04	2.38E-03	2.73E+02
22-Na	7.20E+03	4.13E+03	3.61E-02	2.37E+02
3-H	9.40E+07	ND	ND	1.22E+03
32-P	6.50E+06#	2.26E+03	2.38E-02	2.37E+02
33-P	2.80E+07#	6.20E+03	4.09E-02	2.73E+02
35-S	9.60E+06	3.20E+04	2.38E-03	2.73E+02
36-Cl	3.80E+05	3.20E+03	3.16E-02	2.37E+02
45-Ca	2.10E+06	6.24E+03	4.07E-02	2.73E+02
54-Mn	2.40E+04	3.31E+05	2.45E-04	2.33E+03
51-Cr	3.90E+06#	3.31E+06	2.27E-05	2.12E+04
55-Fe	3.40E+06	1.17E+06	7.92E-04	1.37E+04
57-Co	1.60E+05	3.31E+05	2.23E-04	2.33E+03
63-Ni	1.40E+06	3.92E+03	3.41E-02	1.22E+03
65-Zn	3.70E+04	1.84E+05	1.47E-04	4.65E+03

*Values from NUREG/CR-5512, Pcrit=0.9

Computed using DandD ver. 2.1.0, default parameters

Referring to the weekly wipe test history and the container inspection logs it may be safety concluded that any radioactive contamination that occurred over the years of operation were contained within the building, was confined to surfaces of the floor and processing equipment and orders of magnitude below the DCGL values in table 5. Drain disposal was used for a portion of the operating history and consisted mainly of 3-H and to a lesser extent 14-C and 36-Cl. Review of the operating history does not indicate that the criteria in section 6.6.4 of NUREG/CR-1757, Vol. 1, for exclusion of the site for Group 1-3 screening exists. Therefore, a decommissioning plan is not required and the site will be decommissioned as a Group 2 site for unrestricted release using screening criteria provided in NUREG/CR-5512, PNL-7004, Table 5.19 and DandD v. 2.1.0.

Building 27 Decommissioning Approach

Building 27 was surveyed assuming it met the criteria for a Group 2 Classification, as specified in NUREG-1757, Volume 1. There may be surface contamination on building surfaces and there is no reason or operating history to involve soil or items outside of the building structure. Extensive historical records of material receipt, use and disposal exist to provide a very high level of confidence that no residual contamination exists. Therefore, the building was surveyed using "Simplified Survey Procedures". All building surfaces up to 7 feet were scanned with appropriate radiation detection equipment. Wipe tests were obtained from every 5 foot by 5 foot square on the walls and floors. The number of wipe tests obtained exceeds the recommendation in NUREG-1757 of one 100 cm^2 wipe per 300 ft^2. One 100 cm^2 wipe was obtained for every 25 ft^2 of surface area which results in 12 wipe tests per 300 ft^2. External ambient gamma radiation exposure rates were obtained at one meter above and away from all surfaces using a micro-R Chamber. There is one sink that could have been contaminated. Meter and wipe test surveys were obtained from the drain, the trap and as far down the drain pipe as possible. Wipe tests and meter surveys were also obtained from air handling ductwork that was accessible, including inside of the discharge stack. Discharge air was monitored continuously when the building was occupied and waste handling operations were being performed. Weekly air samples were also taken near work areas. Monitoring was done for tritium, 125-I and particulates. These air samples were uneventful indicating that building structures would not be contaminated. It should be noted that all work that could generate an aerosol was done in a walk in hood.

Radioactive Material Survey Results-Scoping and Final Status

Scoping Surveys

Weekly wipe test and meter surveys were evaluated for the initial scoping survey. All positive wipe test results from the beginning of operations in Building 27 are presented in Table 4. All positive wipe test survey results were below the DCGL values provided in Table 5. No positive ambient radiation surveys were observed during the period, except in the vicinity of a sealed Shepard 137-Cs instrument calibration source located in Area J

of Figure 2 and near short lived nuclear medicine waste stored in Area A. It should be noted that all leak tests of the 137-Cs source were negative to date and no positive wipe test results were observed near the nuclear medicine waste storage area. The maximum wipe test result recorded was 1258 dpm/100 cm^2, that appeared to be 3-H, and was found on a sorting table used to segregate radioactive waste by radionuclide (Area F, figure1). The only positive wipe test identified in the dry waste storage area (Area A) resulted from a wipe of a sorting table surface. There were no positive wipe test results recorded for the dry waste storage area floor (Area A). It is concluded that detected contamination over the period of operation was due to handling of liquids. All dry radioactive waste was brought into Area F in lined containers and immediately transferred to dry waste containers with plastic liners. These containers were stored in Area A. Based on the scoping survey analysis and historical site assessment, it was expected that no radioactive contamination would be detected above or a significant fraction of the DCGL values.

Final Status Surveys

All floors were marked and numbered with 5 foot by 5 foot squares, and wipe tests were taken of each square and counted using a liquid scintillation counter. A floor monitor was used to survey the entire floor surface. A micro-R chamber was used to measure ambient external gamma exposure rates. All walls were surveyed up to a height of 7 feet, using the same grid pattern as the floors. Walls were surveyed with a thin window GM detector (pancake probe). Wall surfaces were also wipe tested. A walk-in hood, a hood over the only sink used for radioactive liquid waste disposal and a compactor were wipe tested and surveyed with the GM detector. Wipes and meter surveys were done in the accessible ductwork leading to these devices. Wipe tests were also taken inside of the filter housing leading to the exhaust stack, as well as the pre, HEPA and charcoal filters. The exhaust stack was also removed and the inside was wipe tested and surveyed using a GM. The trap was removed from the disposal sink located in Area C2 of Figure1 and surveyed. A wipe test and meter survey was done of the trap and piping.

The final status survey indicated that no wipe test was observed to have a detectable amount of radioactivity present. All meter surveys indicated no reading above the detection limit. All data from the Building 27 surveys are on file for review.

Comments Regarding 57-Co, 65-Zn and 54-Mn

The historical site review and survey history for the building indicated that radioactive contamination found during routine surveys probably resulted from liquid radioactive waste. Referring to table 5, the pancake MDC values are greater than the DCGL values for 57-Co, 65-Zn and 54-Mn. Pancake probes were used exclusively to survey the walls and equipment in the building. The Radiation Safety Office has maintained a very accurate waste inventory system since waste began entering the facility. Utilizing this database, it was possible to determine the most recent date that radioactive liquids containing these three radionuclides entered the building. The last date 57-Co liquid entered the building was 9/18/1996, 65-Zn was 2/2/2002 and 54-Mn 3/28/2000. For each

radionuclide, the total activity in liquids brought into the building was decayed to April, 2012, and summed. These sums would represent the maximum possible amount of each of these waste streams that could be present in the building as of the date of this document, assuming none of these liquids were sent for disposal. The results are

57-Co	38.2 dpm	DCGL = 160000 dpm/100 cm^2
65-Zn	7366 dpm	DCGL = 37000 dpm/100 cm^2
54-Mn	2842 dpm	DCGL = 24000 dpm/100 cm^2

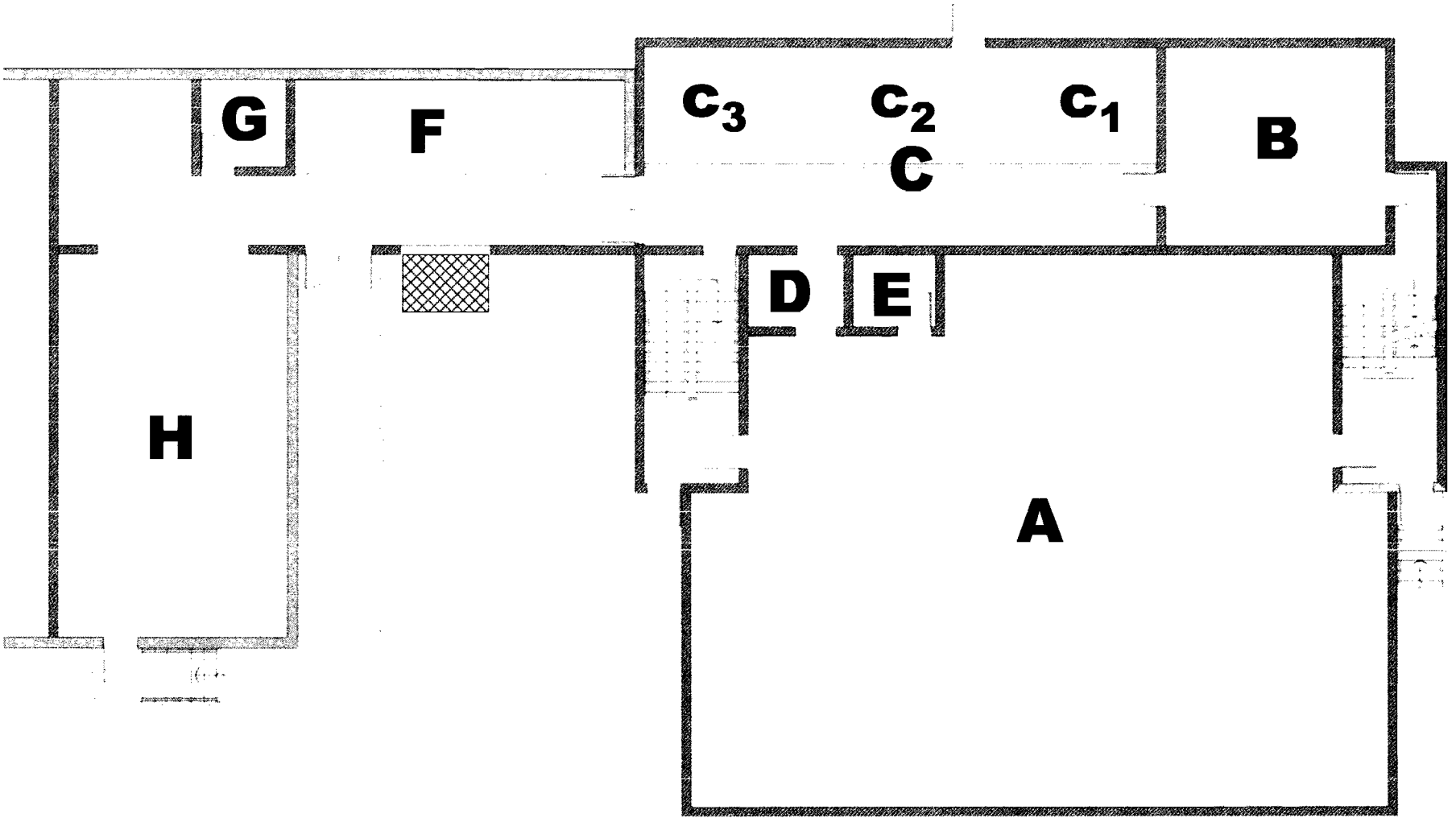
For each radionuclide, the total activity possible is well below each DCGL value if the activity were dispersed over 100 cm^2.

Conclusion

A review of the final status survey results and the scoping survey results indicate that the resulting yearly total effective dose equivalent would be less than 19 mrem/year. It is concluded that the building meets the requirements for unconditional release and subsequent demolition.

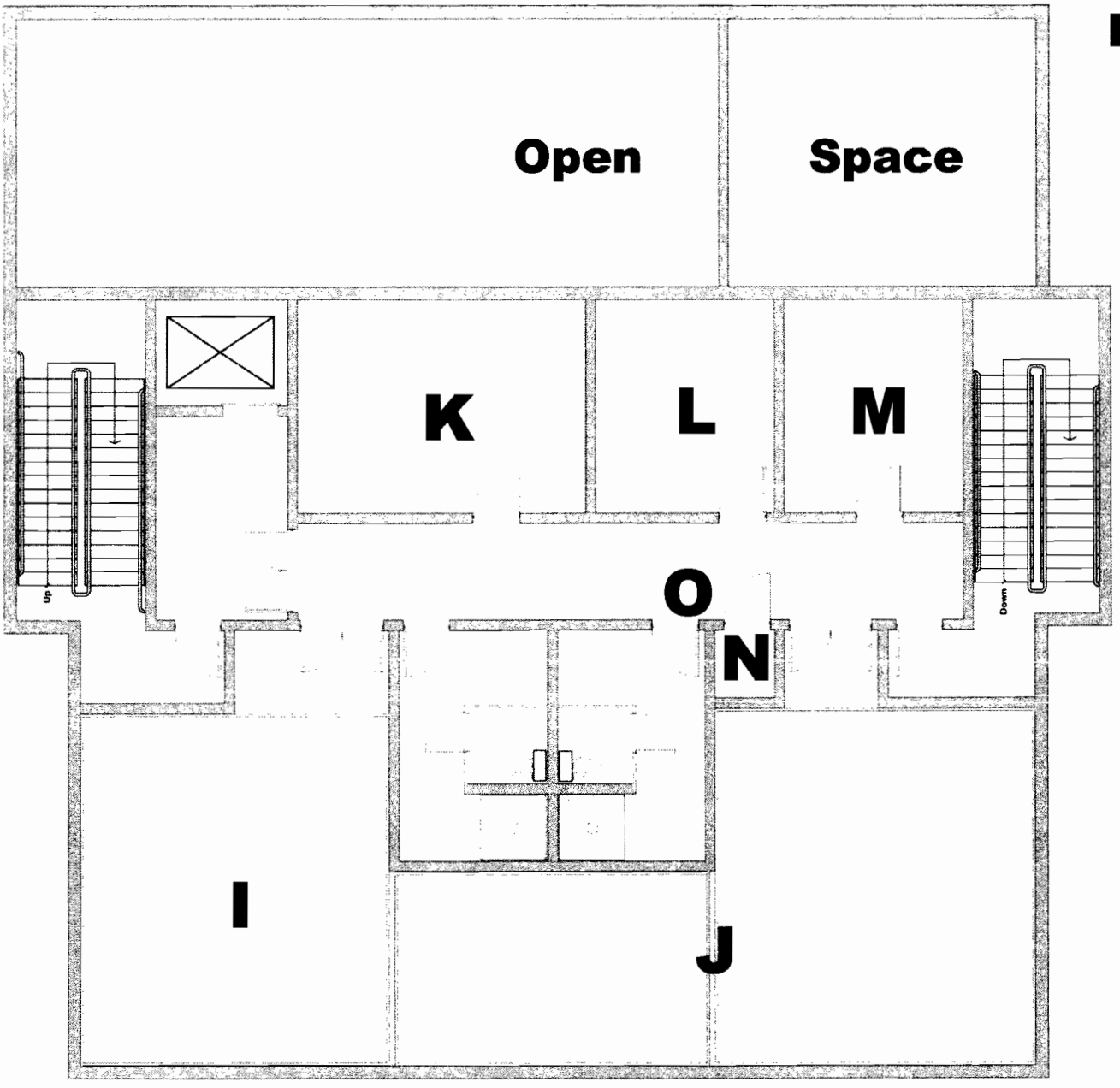
Kenneth Price, MPH, CHP
Executive Director,
Environmental Health and Safety Programs
Radiation Safety Officer

Fig. 1



Ground & Main Floor Plan

Fig. 2



Second Floor Plan

This is to acknowledge the receipt of your letter/application dated

5/7/12, and to inform you that the initial processing which includes an administrative review has been performed.

Amendment (06-13022-02)

☒ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 577516.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader