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REGION I

Office of Research and Graduate Studies

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November 23, 2004

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

03012998
X

re: License renewal for 37-07438-15

Dear Sir or Madam:

Please renew the above referenced license for Philadelphia Health and Education Corporation doing business as Drexel University College of Medicine. Attached is an application in support of this request. Changes to the current license are highlighted in italics. Please note that changes to the possession limits reduce the level of financial assurance required; therefore, we do not need to increase the current level.

If you have any questions about this renewal application please feel free to contact our radiation safety officer, Kent Lambert at 215-762-8768. If I can be of assistance, please do not hesitate to contact me.

I understand that all statements and representations made in this application are binding upon the applicant and that by executing this certification on behalf of the Drexel University College of Medicine, certify that this application is prepared in conformity with title 10, Code of Federal Regulations, Parts 30, 32, 33, 34, 35, 36, 39, and 40, and that all information contained herein is true and correct to the best of my knowledge and belief.

Sincerely,

Leonard M. Stephenson, Ph.D.
Vice Provost for Research
Dean of Graduate Studies

enc.

cc: K. Lambert
S. Murthy, Ph.D.
V. Aloyo, Ph.D.

136063
NMSS/RGNI MATERIALS-002

1. This is an application for

Renewal of license number 37-07438-15

2. Name and Mailing Address of Applicant

Philadelphia Health and Education Corporation,
d/b/a Drexel University College of Medicine
245 N. 15th Street
Philadelphia, PA 19102-1192

3. Addresses Where Licensed Material will be Used or Possessed

- a. Broad and Vine Streets, Philadelphia, PA
- b. 3300 Henry Avenue, Philadelphia, PA
- c. 2900 Queen Lane, Philadelphia, PA
- d. Erie Avenue at Front Street, Philadelphia, PA
- e. 700 East Butler Avenue, Doylestown, PA

4. Name of Person to be Contacted About this Application

For technical issues contact:

Kent Lambert
Radiation Safety Office, MS 444
245 N. 15th Street
Philadelphia, PA 19102-1192

voice: 215-762-8768
fax: 215-762-3722
e-mail: kent.lambert@drexel.edu

For administrative issues contact:

Leonard M. Stephenson
Vice Provost for Research and Dean of Graduate Studies
245 N. 15th Street
Philadelphia, PA 19104

voice: 215-895-6329

5. Radioactive Material

Item No.	a. Element and Mass No.	b. Chemical / Physical form	c. Possession limit
<i>i</i>	Any byproduct material with Atomic Nos. 3 through 83, with half life of 120 days or less	Any	Not to exceed 200 millicuries of each radionuclide and 5 curies total
<i>ii</i>	<i>Any byproduct material with atomic numbers 3 through 83 with a half life greater than 120 days</i>	<i>Any</i>	<i>Not to exceed 0.05 millicurie of each radionuclide and 10 millicuries total. Additionally, the quantity will be limited such that R for radionuclides in this item is less than 100</i>
<i>iii</i>	Hydrogen 3	Any	2000 millicuries
<i>iv</i>	Carbon 14	Any	500 millicuries
<i>v</i>	Phosphorous 32	Any	2000 millicuries
<i>vi</i>	Sulfur 35	Any	1000 millicuries
<i>vii</i>	Chlorine 36	Any	4 millicuries
<i>viii</i>	Calcium 45	Any	25 millicuries
<i>ix</i>	Chromium 51	Any	500 millicuries
<i>x</i>	Iodine 125	Any	1000 millicuries
<i>xi</i>	Cesium 137	Sealed source (MDS Nordion Model C-3001)	As specified in the Sealed Source Device Registry
<i>xii</i>	Any byproduct material with atomic numbers 3 through 83 with a half life greater than 120 days	Sealed sources indicated in table below	Not to exceed 0.5 millicuries total

Isotope	Source Model No.	Maximum Activity per Source
Cesium 137	Beckman 167760	40 µCi
Cesium 137	Beckman 595255	40 µCi
Cesium 137	Beckman 598860	40 µCi
Cesium 137	Beckman 501095	40 µCi
Europium 152	Wallac Inc. Oy Model 10860851	20 µCi
Europium 152	Wallac Inc. Oy Model 10861091	20 µCi
Barium 133	Isotope Products Laboratory Model 377	22 µCi
Barium 133	New England Nuclear Model NER 8133	22 µCi
Barium 133	North American Scientific Model 1401	22 µCi
Americium 241	Amersham Model AMCK599	130 µCi

Strontium 90 and nickel 63 sealed sources have been disposed; iodine 129 is incorporated in item ii. Consequently, strontium 90, nickel 63, and iodine 129 are intentionally omitted. We have corrected one omission, two errors in model numbers, and one error in amount on the table of sealed sources.

Decommissioning Fund Plan

The value R, as defined in 10 CFR 30.35(a), is 10000. This exceeds 10^3 but does not exceed 10^4 ; therefore, based on the table in 10 CFR 30.35(d) financial assurance is required at a level of \$225,000. We currently maintain a line of credit for decommissioning of \$900,000. We reserve the right to reduce this line of credit to \$225,000.

6. Purpose For Which Licensed Material Will Be Used

Items *i – x*: Research and development; animal studies; teaching and training of students.

Item *xi*: Self shielded irradiator for the irradiation of materials and animals.

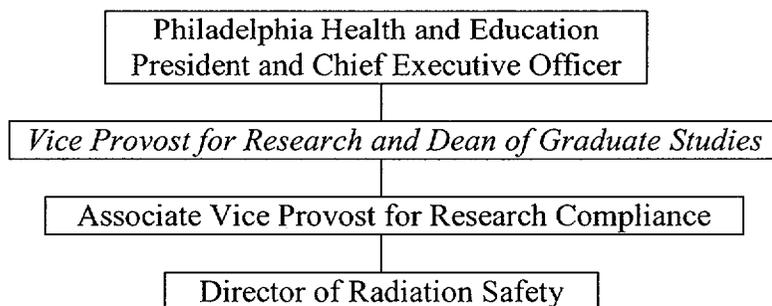
Item *xii*: For the removal and possession of sealed sources incidental to disposal.

7. Individuals Responsible For Radiation Safety Programs

7.1 Executive Management

The *Vice Provost for Research and Dean of Graduate Studies* is responsible for the oversight of the radiation safety program and has the ultimate responsibility for the license and the activities associated with the license. As indicated in the organizational chart below, the Vice Provost for Research and Dean of Graduate Studies reports directly to the Provost of the University.

The Director of Radiation Safety and Radiation Safety Officer reports to the Associate Vice Provost for Research Compliance, who, in turn, reports directly to the *Vice Provost for Research and Dean of Graduate Studies*.



7.2 Radiation Safety Committee

The *Vice Provost for Research and Dean of Graduate Studies* appoints the chair and members of the Radiation Safety Committee.

The Committee is composed of faculty members that represent departments whose facilities utilize radiation sources for research and development purposes. The RSO and a member of Drexel University College of Medicine's Administration (e.g., the Associate Vice President for Research Compliance) are permanent members of the Committee. Alternate members may be appointed in the case of absence of principle faculty members.

The Committee shall meet as often as necessary to conduct its business but not less than once in each calendar quarter.

To establish a quorum, one-half of the Committee's membership, including the RSO, must be present.

The responsibilities of the Radiation Safety Committee are:

- Ensure that radiation sources are used safely.
- Ensure that radiation sources are used in compliance with federal and state regulations.
- Ensure that the use of radiation sources is consistent with the principle of maintaining radiation exposures as low as reasonably achievable (ALARA).
- Identify program problems and solutions.

To meet these responsibilities, the Radiation Safety Committee will:

- Meet as often as necessary to conduct its business but not less than quarterly.
- Be familiar with all pertinent NRC regulations, the license application, the license, and amendments.
- Review the training and experience of the proposed authorized users, and the Radiation Safety Officer to determine that their qualifications are sufficient to enable the individuals to perform their duties safely and are in accordance with the regulations and the license.
- Review on the basis of safety and approve or deny, consistent with the limitations of the regulations, the license, and the ALARA philosophy, all requests for authorization to use radioactive material within the institution.
- Prescribe special conditions that will be required during a proposed method of use of radioactive material such as requirements for bioassays, physical examinations of users, and special monitoring procedures.
- Review quarterly the Radiation Safety Officer's summary report of the occupational radiation exposure records of all personnel giving attention to individuals or groups of workers whose occupational exposure appears excessive.
- Establish a program to ensure that all persons whose duties may require them to work such that they are likely to receive an annual occupational dose of 100 millirem (1 millisievert), including security, housekeeping and physical plant employees, are appropriately instructed as required in 10 CFR 19.12.
- Review and approve of permitted program and procedural changes prior to their implementation.
- Implement, through the Radiation Safety Officer, the program and procedural changes.
- Review at least annually the RSO's summary report of the entire Radiation Safety Program to determine that all activities are being conducted safely, in accordance with NRC regulations and the conditions of the license, and consistent with the ALARA

program and philosophy. The review will include an examination of records, reports from the RSO, results of NRC inspections, written safety procedures, the impact of procedural or program changes, and adequacy of the management control system.

- Determine the cause of noncompliance or deficiencies in the radiation safety program, and take corrective actions that include actions to prevent recurrence.
- Maintain written minutes of all Committee meetings, including members in attendance and members absent, discussions, actions, recommendations, decisions, and numerical results of all votes taken.

The Radiation Safety Officer pre-reviews the proposed authorized users training and experience with radioactive material. The Radiation Safety Committee will use the following criteria when authorizing uses and users of licensed material:

All potential authorized users must file an application that includes their training and experience and the proposed uses of radioactive materials. This application will be approved or disapproved by the Radiation Safety Committee. The criteria for granting approval will be based on the following schedule of training and experience.

To be an authorized user, an applicant must have the following education, training and experience:

- A college degree in physical or biological sciences.
- A minimum of 40 hours formal classroom and/or supervised on the job training in:
 - The characteristics of ionizing radiation
 - Radiation dose and quantities
 - Radiation detection instrumentation
 - Biological hazards of exposures to radiation appropriate to the types, quantities and forms of radioactive material to be used.

An authorized user must have previous experience working with radioactive materials which pose similar radiological protection problems. An individual does not need previous experience working with similar radioactive material to work with radioimmunoassay kits, or generally licensed radioactive material.

An inexperienced applicant may gain experience by one of the following methods. The Radiation Safety Officer will determine which is most appropriate.

- Perform dry run of proposed procedure under the review of a member of the Radiation Safety staff.
- Perform a limited activity run of the proposed procedure.
- Perform the procedure under the supervision of an authorized user which has approval to perform the same procedures.

The Radiation Safety Committee will use the following criteria to approve authorized uses:

Authorized users proposing uses of radioactive material must submit an application to the Radiation Safety Office for initial review. The Radiation Safety Office conducts a review of the proposed use, interviews the user, and examines the facility. Specific handling procedures are addressed to reduce risks of contamination and generation of airborne radioactive material; reduce radiation levels; ensure proper disposal of

radioactive waste; and general radiation safety procedures. The review is dependent on the type and quantity of radioactive material and its proposed use. For example a proposal for radioimmunoassay kits will not receive the same scrutiny as a proposal for 5 mCi of sodium iodide for radioiodination of cell surface proteins.

The facilities and equipment are reviewed for adequacy. At a minimum, laboratories must have a sink, telephone, doors which lock, workspace suitable for the proposed radioactive work, and access to radiation detection equipment. The type, quantity, and accessibility of radiation detection equipment requirements depend on the type and activity of radioactive material being used. For example, a radiation survey meter is not required for a laboratory handling tritium or RIA kits, but a survey meter is required for laboratories working with millicurie quantities of ³²P. Local or area shielding will be evaluated to assure that the dose rate in unrestricted areas is less than 2 mrem/hour and that an individual in unrestricted areas would not receive an annual dose in excess of 100 millirem.

Surveys will be performed and documented using a risk informed basis as follows:

<i>Group</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>	<i>Quarterly</i>
1	>100 mCi	1-100 mCi	<1 mCi	---
2	>500 mCi	5-500 mCi	0.05-5 mCi	<0.05 mCi
3	>1,000 mCi	10-1000 mCi	0.1-10 mCi	<0.1 mCi
4	>5,000 mCi	50-5000 mCi	0.5-50 mCi	<0.5 mCi

The D&D software prepared for the NRC by Sandia Laboratories was used to determine the average activity needed to cause an exposure of 1 millirem using the building occupancy model and default values for occupancy and breathing rate and increasing the resuspension and ingestion transfer rates by a factor of 10. The isotopes were then grouped based on these results as follows.

<i>Group</i>	<i>Activity resulting in 1 mrem/year</i>	<i>Example Isotopes</i>
1	< 750 dpm/100 cm ²	²² Na, ⁸⁶ Rb, ²⁴ Na, ¹³¹ I
2	750 – 2500 dpm/100 cm ²	¹²⁵ I, ⁸⁹ Sr, ¹¹¹ In, ³² P, ⁵⁷ Co
3	2500 – 50,000 dpm/100 cm ²	⁴⁵ Ca, ^{99m} Tc, ¹⁴ C, ³³ P, ³⁵ S, ⁵¹ Cr
4	>50,000 dpm/100 cm ²	³ H

Upon completion of the initial review of the proposed use of radioactive material, the radiation safety office will submit the application to the Radiation Safety Committee to be considered by the Committee. Between meetings of the Radiation Safety Committee, the proposal may be distributed to each member of the Committee and the member's vote determined by poll of the Committee.

Tentative approval for proposed uses may be granted by the Radiation Safety Officer with concurrence by the Chair of the Radiation Safety Committee. To be considered for tentative approval, proposed uses must meet the following conditions:

- a. The individual has already been approved as an authorized user for other materials/uses,
- b. The proposed use is an *in vitro* experiment, and
- c. The proposed use is similar to other approved uses at the institution.

In general, tentative approvals are granted to change chemical forms, to allow one-time-only procedures, to add an isotope, or to increase a possession limit. Tentative approvals are temporary, expiring at the time of the next Radiation Safety Committee meeting. Tentative approval will be granted for activities not greater than 1 millicurie (for requests to increase the possession limit, the increase will not exceed 1 millicurie).

Any new unregistered sealed sources and devices must be reviewed and approved by the Radiation Safety Committee. We will use the procedures outlined in NUREG-1556, Vol. 3, "Consolidated Guidance About the Materials Licenses – Applications for Sealed Source and Device Evaluation and Registration" to perform this evaluation.

The following process will be implemented to review procedure and program changes:

- The need for procedural or program change will be identified.
- A procedural or program change will be proposed including the reasons for the change
- The proposed change will be evaluated by the radiation safety officer for compliance with regulations and license conditions.
- The proposed change and the results of the Radiation Safety Officer's evaluation will be submitted to the Radiation Safety Committee for review.
- The Radiation Safety Committee will evaluate the proposed change for its impact on safety.
- The Radiation Safety Committee will deliberate and vote to approve or disapprove the change. The proposed change, the Radiation Safety Officer's evaluation, and the results of the Radiation Safety Committee's actions will be maintained in the Radiation Safety Committee minutes.
- The Radiation Safety Officer will implement the change and affected persons will be instructed of the change.
- The item will remain on the Radiation Safety Committee minutes as old business until the results of the change have been evaluated and reported to the Radiation Safety Committee.

7.3 Radiation Safety Officer (RSO)

Kent Lambert, M.S., CHP, is the Radiation Safety Officer for Drexel University. He is certified by the American Board of Health Physics in comprehensive health physics and has over 20 years experience in radiation safety at academic institutions. A statement of training and experience is attached.

The charge to the RSO is as follows:

The appointed RSO is responsible for ensuring the safe use of sources of radiation. The RSO is responsible for managing the radiation safety program; identifying radiation safety

problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; and ensuring compliance with regulations.

The RSO is hereby delegated the authority necessary to meet those responsibilities including the authority to suspend operations which are deemed to be unsafe or otherwise in noncompliance with licensure and/or Drexel University policy or regulations. The RSO is also responsible for assisting the Radiation Safety Committee in the performance of its duties.

7.4 Radiation Safety Office Staff

The Radiation Safety Officer has support staff which includes:

- Radiation Safety Supervisor
- Radiation Safety Technologists
- Administrative Coordinator

These staff members provide services to other facilities as well, but are available as necessary to support the activities at Drexel University.

8. Training For Individuals Working In Or Frequenting Restricted Areas

In general we confirm that we will follow the requirements for training in 10CFR 19.12. Implementation methods of training include lectures, slide shows, video programs, computer based instruction, written information notices, and/or practical field demonstrations. The RSO reports on the training conducted by the Radiation Safety Office to the Radiation Safety Committee.

Authorized Users

New authorized users will meet with the RSO or a Radiation Safety Office staff member to discuss institution specific radiation safety requirements.

Supervised Users

The Authorized User is responsible for providing appropriate laboratory specific training to supervised users prior to working with or around sources of licensed material. The minimum content of the training is provided below:

- Applicable regulations and authorization conditions
- Areas where radioactive material are used or stored
- Potential hazards associated with radioactive material in each area where the supervised user will work
- Appropriate radiation safety procedures
- In-house work rules
- Worker's obligation to report unsafe conditions to the Radiation Safety Officer
- Appropriate responses to emergencies or unsafe conditions
- Worker's rights to be informed of occupational radiation exposure and bioassay results

- Locations where notices, regulations, authorizations, and authorization conditions are posted or available

In addition to the initial laboratory specific training provided by the authorized user, each radiation worker that does not have previous training and experience using radioactive materials must attend Radiation Safety Short Course conducted by the Radiation Safety Office prior to beginning work with radioactive materials. The instructors will be Radiation Safety Office technical or professional staff. Topics covered in the Radiation Safety Short Course include but are not limited to:

- Radiation and radioactivity
- Biological effects
- Dose limits
- ALARA
- Radiation protection
- Radiation detection
- Personnel monitoring
- Federal regulations
- Institutional controls
- General laboratory radiation safety procedures
 - Posting and labeling
 - Radiological contamination
 - Good laboratory practices
 - Characteristics of commonly used isotopes
 - Radiation accidents and emergencies
 - Waste disposal
 - Personal protective equipment

To ensure that attendees have completed the training requirements, we will administer a basic test; all attendees must score at least a 65. The course is offered as needed, four or more times a year.

Ancillary Personnel

Radiation safety orientations will be provided for Maintenance, Security, Environmental Services and other ancillary staff who on occasion may have activities involving radioactive materials. The minimum content of the ancillary personnel orientation is provided below:

- Warning signs and their meanings:
 - Do not enter areas with Caution - Radiation Area, Caution High Radiation Area, or Grave Danger - Very High Radiation Area warnings without authorized personnel present.
 - Areas with Caution - Radioactive Material may be entered with precaution.
- Precautions to be followed when entering labeled facilities:
 - Stay away from sections of room where any radiation caution signs are posted.
 - Do not remove any material or objects labeled with any radiation caution signs or which are placed in areas labeled with such signs.

- Do not remove trash containers having caution radiation signs on it.
- When leaving the room make sure that the door is closed and locked behind you if no one is present in the room
- If a room is found bearing any radiation caution signs which is unlocked and unattended, report it to Security or directly to the Radiation Safety Office.
- In case of any doubt as to proper procedures or any suspicion contact the Radiation Safety Office.

Other instruction will be based on specific needs of the staff receiving the training.

Refresher training will be offered by the Radiation Safety staff as needed and at least annually. The successfulness of training is assessed during the audits performed by the Radiation Safety staff.

We request the flexibility to revise the training program described above. The revision process is outlined in the Radiation Safety Committee section of this application.

9. Facilities and Equipment

Overall Description of Facility

Drexel University College of Medicine is an educational, research and development institution. Clinical activities conducted by Drexel University College of Medicine for which the NRC has jurisdiction are licensed separately.

Criteria For The Approval Of Facilities And Equipment For Radiation Sources Usage:

The criteria for the approval of facilities and equipment have been previously described in the Radiation Safety Committee section of this application.

Locations Where Radioactive Materials Are Used

Drexel University College of Medicine uses radioactive materials in a variety of laboratory settings. There are no shielded facilities, radiation areas, high radiation areas, or very high radiation areas.

Bench top or open work areas are used for sealed sources, sources in solid form that are not likely to become dispersed or airborne, and liquids with low volatility. Trays or plastic-backed, absorbent paper or both are used to perform work with liquids to contain spilled liquids.

Many laboratory facilities have chemical type fume hoods which could be used for work with radioactive material that have the potential of becoming airborne. However, no work of this nature is currently being performed. There is one chemical fume hood at the Center City campus (New College Building, Room 12133) that is set up for breathing zone and effluent monitoring should the need arise. The facility also has a glove box available. The

facility has local exhaust filtering (activated charcoal) to reduce radioactive effluent. The minimum airflow for this hood is 100 linear feet per minute. *The flow rate is measured annually.*

The Radiation Safety Office and the Radiation Safety Committee will review any proposed activities that may generate airborne radioactive material and require the authorized user to adhere to conditions imposed, including using chemical fume hoods or other protective apparatus. The Radiation Safety Officer will develop and require the use of air sampling system to measure the concentration of licensed material in air effluent and in the laboratory (breathing zone) prior to these activities being performed.

Labeled sinks are used in laboratories where the disposal of radioactive materials into the sanitary sewer is authorized by the Radiation Safety Committee.

Irradiator Facility

We confirm that the self-shielded irradiator is located in an area that corresponds to the 'Conditions of Normal Use' and 'Limitations and/or Other Considerations of Use' on the applicable irradiator's Sealed Source and Device Registration Certificate; the floor beneath the self-shielded irradiator is adequate to support the weight of the irradiator; the self-shielded irradiator is secured to prevent unauthorized access or removal; and the area where the self-shielded irradiator is located is equipped with automatically operated fire detection and control system (sprinkler, chemical, or gas) or the location of the area and other controls ensure a low-level radiation risk attributable to fires.

Equipment

Drexel University College of Medicine uses no special equipment such as respiratory protective equipment or hot cells, except as previously indicated.

A variety of local shielding are available including ½ inch thick acrylic shields for high energy beta emitters, lead bricks and containers for gamma emitters. Forceps and other remote handling tools are available.

10. Radiation Safety Program

10.1 Audit Program

The aim of the radiation safety audit program is to:

- Assure good radiation safety practices
- Improve compliance with regulations and institutional policy,
- Identify program weaknesses and the corresponding corrective steps needed

Conduct of the Audit Program

The audit program is normally carried out by the RSO and the Radiation Safety Office staff. A summary of the results of these audits are submitted to the Radiation Safety

Committee for review and for further actions if these are necessary. As a member of the Radiation Safety Committee, management is kept aware of such actions including the need to correct deficiencies identified in the audit, and the need for provision of resources to correct deficiencies. In addition, the RSO has direct access to management when necessary.

Facility audits performed by the RSO will at a minimum include:

- Review of user inventory, use, and disposal of byproduct material records
- Review of survey records
- Evaluation of user and technician training through discussion and observation of work practices
- Evaluation of compliance with NRC regulations, the conditions of the license, the RSC/RSO authorization and safety manual requirements
- Provision for performance-based instruction, including emergency instructions to users and technical level staff

Laboratories are audited once in each calendar trimester (i.e., January – April; May – August; September – December). Use of the irradiator is audited semi-annually.

Records will be maintained of all audits including corrective steps and follow-up audits where necessary in compliance with 10 CFR 20.2102.

We request the flexibility to revise the audit program described above. The revision process is outlined in the Radiation Safety Committee section of this application.

10.2 Instruments

The criteria to be used by the RSO to review and approve radiation monitoring instrumentation are adequate for the measurement tasks are as follows:

- Assure that an appropriate number and type of radiation detection and measurement instruments are available. This includes assuring proper sensitivity and energy dependence. In general:
 1. GM detector survey meters will be used for contamination surveys and detection of beta and gamma emitters
 2. NaI(Tl) scintillation detector survey meters will be used for contamination surveys and detection of low energy gamma emitters.
 3. Ion chamber survey meters will be used for measuring exposure or exposure rates. GM detector survey meters with exposure rate scales may be used to measure exposure rates provided that they are calibrated to the isotope being measured or to an isotope with similar emissions, or a known energy response factor is used and applied.
 4. Scintillation well counters or liquid scintillation counters will be used for swipe surveys.
- Assure that such detection instrumentation is calibrated as necessary. Those instruments to be used for detection of radioactivity (e.g. contamination) by laboratory personnel will have a check source attached and to check for proper operation. These

instruments will not otherwise be calibrated. Instruments to measure radiation levels will be calibrated annually. Calibrations will be performed by a person specifically licensed to perform instrument calibrations.

- Assure that check sources, where appropriate, are attached to survey meters to check consistency of operation.

The following table is a partial list of radiation detection equipment available at the institution. The listed equipment is specifically available at the Radiation Safety Office.

Number	Manufacturer and Model	Type
10	Ludlum Model 3	Survey Meter with Geiger Mueller (end window or pancake) probes
2	Ludlum Model 3	Survey Meter w/ 44-3 NaI crystal probe
2	Ludlum Model 14C	Survey Meter with Geiger Mueller (end window or pancake) probes
1	Victoreen Model 450P	Ion chamber
1	Keithley Model 36150	Ion chamber
1	Victoreen Model 190	Pancake GM probe

The following analytical radiation detection equipment is available:

Number	Manufacturer and Model	Type
1	TM Analytic 1193	Gamma Counter
1	Beckman LS 6500	Liquid Scintillation Counter
1	Ludlum 2200	Single channel analyzer

Radiation Safety Office survey meters are calibrated annually. Survey meter calibration services are performed by a vendor specifically licensed to perform such activities. Among the vendors that may be used are: Ludlum Measurements, Inc., RSO, Inc., and JRT Corporation.

We request the flexibility to revise the instrumentation specifications described above. The revision process is outlined in the Radiation Safety Committee section of this application.

10.3 Material Receipt and Accountability

All purchase requisitions must be reviewed, approved, and signed by a member of the Radiation Safety Office prior to the order being placed. Only the purchasing department is permitted to place the order.

Criteria for approval of purchase and delivery are whether:

- Recipient is an authorized user for particular nuclide to be purchased
- The possession limits are not exceeded
- All packages except those delivered as indicated below are checked by Radiation Safety Office and then delivered to the Authorized User. Packages delivered to Erie Avenue at Front Street, Philadelphia and 700 Butler Avenue, Doylestown are checked

by individuals specifically authorized and trained by Radiation Safety staff in the proper procedures to receive packages of radioactive material.

The Authorized User is also required to:

- Maintain a log on all use, waste disposal and transfer of radioactive material
- Maintain secure areas where radioactive materials are used and/or stored
- Have available documentation to be reviewed during laboratory audits

We request the flexibility to revise the radioactive material receipt and accountability program described above. The revision process is outlined in the Radiation Safety Committee section of this application.

10.4 Occupational Dose

Monitoring of personnel is provided for any individual likely to receive greater than 10% of any applicable dose limit. Individuals handling greater than 1 millicurie of gamma emitting or high energy beta emitting radionuclides are monitored. Extremity monitoring is provided for individuals whose manipulation of the radiation sources may result in exposures to extremities.

As a part the institution's policy to maintain radiation exposures as low as reasonably achievable (ALARA), deep dose equivalents exceeding 125 mrem in a calendar quarter are reviewed by the Radiation Safety Office and the individual notified. Deep dose equivalents exceeding 375 mrem in a calendar quarter are investigated to find determine the cause and ways to reduce the exposure. The following table lists trigger levels.

Exposure Type	Review and Notification Trigger Level	Investigation Trigger Level
Deep Dose Equivalent	125 mrem per quarter	375 mrem per quarter
Shallow Dose Equivalent	1250 mrem per quarter	3750 mrem per quarter
Extremity Dose Equivalent	1250 mrem per quarter	3750 mrem per quarter
Fetal Dose Equivalent	--	50 mrem per month

We request the flexibility to revise the personal radiation monitoring program described above. The revision process is outlined in the Radiation Safety Committee section of this application.

10.5 Safe Use of Radionuclides and Emergency Procedures

We will adopt the general topics for safe use of radioisotopes and model emergency procedures in Appendix R of NUREG 1556 Volume 11 "Program Specific Guidance About Licenses of Broad Scope".

We request the flexibility to revise our safe use and emergency procedures described above. The revision process is outlined in the Radiation Safety Committee section of this application.

10.6 Surveys

The criteria for laboratory surveys were previously indicated in the Radiation Safety Committee section of this application. Additional surveys are performed quarterly by the Radiation Safety Office. At removable contamination levels in excess of 1000 dpm/100 cm² the laboratory will decontaminate the area.

We will perform bioassays of occupationally exposed workers under the following conditions:

- working with 1 millicurie or more of radioiodine as sodium iodide or other chemical form which may become volatile;
- working with 40 millicuries or more of tritiated water or other tritiated compound which is or may become volatile;
- personal contamination which may be absorbed through the skin;
- personal contamination in or around the eyes, nose, mouth or open wound.

We will follow the model leak test procedures in Appendix T of NUREG 1556, Volume 11 "Program Specific Guidance About Licenses of Broad Scope." *except that we may use a single swab or filter paper to check for leakage of more than one source. If activity on the swab exceeds 0.05 μ Ci then each source will be individually tested.*

We request the flexibility to revise the leak test, survey and bioassay programs described above. The revision process is outlined in the Radiation Safety Committee section of this application.

11. Waste Management

Radioactive waste is segregated and handled based on its characteristics. The following methods are employed for waste disposal based on the waste characteristics.

Decay In Storage

We will follow the model procedure in Appendix V of NUREG 1556 Volume 11 *except that we may dispose of radioactive material before it has been stored for 10 half-lives of the longest lived isotope in the waste and we may not remove radiation labels on materials that are within containers and that will be managed as biomedical waste after they have been released from our facility. (See 10 CFR 35.92.)*

Transfer to Authorized Recipient

Byproduct radioactive waste with a half-life > 120 days will be transferred to a licensed broker (such as, Bionomics, Inc.) for disposal at a licensed disposal facility. Sources may also be returned to the manufacturer or transferred to a person specifically licensed to receive the licensed material.

Sewer Disposal

We will follow the Model Procedure for Disposal of Liquids Into Sanitary Sewerage found in NUREG 1556, Volume 11, Appendix V.

Incineration

We will not be incinerating byproduct material

Disposal of Specific Wastes as if it Were not Radioactive

We will follow the requirements of 10 CFR 20.2005 for disposal of liquid scintillation medium, animal carcasses and/or animal tissue as non-radioactive material.

Burial

We have no waste burial sites at our facility.

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

11/23/2009, and to inform you that the initial processing which includes an administrative review has been performed.

RENEW 37-07438-15
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

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 136063.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

BETWEEN: : (FOR LFMS USE)
 : INFORMATION FROM LTS
 : -----
 :
 License Fee Management Branch, ARM : Program Code: 01100
 and : Status Code: 2
 Regional Licensing Sections : Fee Category: EX 3L
 : Exp. Date: 20041231
 : Fee Comments: 170.11(A)(4) EFF 7/2/90
 : Decom Fin Assur Req'd: Y
 : ::::::::::::::::::::::::::::::::::::::::::::

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
 Applicant/Licensee: PHILADELPHIA HEALTH & EDUCATION COR
 Received Date: 20041201
 Docket No: 3012998
 Control No.: 136063
 License No.: 37-07438-15
 Action Type: Renewal

2. FEE ATTACHED
 Amount: _____
 Check No.: /

3. COMMENTS

Signed M.A. Perkins
 Date 12/5/04

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /__/)

- 1. Fee Category and Amount: _____
- 2. Correct Fee Paid. Application may be processed for:
 - Amendment _____
 - Renewal _____
 - License _____
- 3. OTHER _____

Signed _____
 Date _____