



CONNECTICUT COLLEGE

VICE PRESIDENT FOR FINANCE AND ADMINISTRATION

May 3, 2018

Licensing Assistance Team
Division of Nuclear Materials Safety
U.S. Nuclear Regulatory Commission, Region I
2100 Renaissance Blvd., Suite 100
King of Prussia, PA 19406-2713

Br. 2
03039110
06-09241-02

REC RG 1 05 08 18 AM 07:07

Re: Radioactive Materials License Application

To Whom It May Concern:

I am writing to request a radioactive material license for Connecticut College. Enclosed are two (2) complete copies of our license application for your review and approval. This application was prepared using NUREG-1556, Vol. 11 "Program Specific Guidance about Licenses of Broad Scope" dated February 2017.

Mr. Steven Langlois, Director of Environmental Health and Safety, will serve as our Radiation Safety Officer (RSO). Mr. Langlois has been authorized to act on behalf of the College on matters relating to radiation safety and licensing. Please direct all communications regarding operations under this license to his attention.

If you have any questions regarding our application or if you require any additional information, please contact Mr. Langlois at (860) 439-2252, or email at steven.langlois@conncoll.edu.

Sincerely,

Richard Madonna
VP for Finance and Administration

Enclosures

608770
NMSS/RGN1 MATERIALS-002

(06-2016)
10 CFR 30, 32, 33, 34
35, 36, 37, 39, and 40

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the FOIA, Privacy, and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), 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.



APPLICATION FOR MATERIALS LICENSE

INSTRUCTIONS: SEE THE CURRENT VOLUMES OF THE NUREG-1556 TECHNICAL REPORT SERIES ("CONSOLIDATED GUIDANCE ABOUT MATERIALS LICENSES") FOR DETAILED INSTRUCTIONS FOR COMPLETING THIS FORM: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/>. SEND TWO COPIES OF THE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

MATERIALS SAFETY LICENSING BRANCH
DIVISION OF MATERIAL SAFETY, STATE, TRIBAL AND RULEMAKING PROGRAMS
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,

SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING,

SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

A. NEW LICENSE

B. AMENDMENT TO LICENSE NUMBER _____

C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)

Connecticut College
270 Mohegan Avenue
New London, Connecticut 06320-4196

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Connecticut College
270 Mohegan Avenue
New London, Connecticut 06320-4196

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Steven Langlois

BUSINESS TELEPHONE NUMBER

860-439-22

BUSINESS CELLULAR TELEPHONE NUMBER

860-625-52

BUSINESS EMAIL ADDRESS

steven.langlois@conncoll.edu

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (Fees required only for new applications, with few exceptions*)

(See 10 CFR 170 and Section 170.31)

*Amendments/Renewals that increase the scope of the existing license to a new or higher fee category will require a fee.

FEE CATEGORY

AMOUNT ENCLOSED \$

0

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 37, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 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.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE

Richard Madonna VP for Finance & Administration

SIGNATURE

Richard Madonna

DATE

5/3/18

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

5. RADIOACTIVE MATERIAL

Any chemical or physical form of byproduct material as specified in Section 33.100, Schedule A, or 10 CFR Part 33 (Type B Broad Scope License). If only one radionuclide is possessed, the possession limit is the quantity specified for that radionuclide in 10 CFR 33.100, Schedule A, Column I. If two or more radionuclides are possessed thereunder, the possession limit for each will be determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in § 33.100, Schedule A, Column I, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

The possession of isotopes with half-lives greater than 120 days will be limited to amounts below those requiring financial assurance or a decommissioning funding plan as specified in 10 CFR 30.35.

6. PURPOSE FOR WHICH LICENSED MATERIAL WILL BE USED

Radioactive material identified in Section 5 above will be used for research and development as defined in 10 CFR 30.4; teaching and training of students.

7. INDIVIDUALS RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

A. Radiation Safety Officer (RSO)

The Radiation Safety Officer (RSO) will be Mr. Steven Langlois. His resume outlining his training and experience and his Delegation of Authority letter are included as Attachment A of this application.

Mr. Langlois assisted the RSO in managing the day-to-day operations of the radiation safety program under Connecticut College's previous radioactive material's license. Mr. Langlois will report directly to the Director of Facilities Management to appropriate the necessary resources to ensure that the objectives of the radiation safety program and related regulatory requirements are met. He will have authority over authorized users with regard to licensed radioactive materials, which includes the authority to immediately terminate any unsafe or unauthorized act involving licensed material. An organizational chart depicting management structure is included as Attachment B to this letter.

The RSO will be responsible for the following aspects of the Radiation Safety Program:

- 1) Reviewing and approving proposed uses and users of radioactive material.
- 2) Monitoring and surveys of all areas in which licensed radioactive material is used and/or stored;
- 3) Overseeing ordering, receipt, surveys, and delivery of radioactive material;
- 4) Packaging, labeling, surveys, etc., of all shipments of radioactive material leaving the company;
- 5) Monitoring programs, including determining the need for and evaluating bioassays, monitoring personnel exposure records, and developing corrective actions for those exposures approaching maximum permissible limits;
- 6) Training of personnel;
- 7) Monitoring inventory and leak tests of sealed sources;
- 8) Overseeing decontamination;
- 9) Investigating any incidents and responding to any emergencies; and
- 10) Maintaining all required records.

The responsibilities of the RSO will not be transferred to other individuals. Many of the tasks and duties associated with managing the program may be assigned or delegated to other qualified individuals; however, the responsibility for these tasks and duties is with the RSO.

B. Authorized Supervisors and Authorized Uses

Radioactive material possessed under the license will only be used by, or under the direct supervision of individuals approved in writing by the Radiation Safety Officer (RSO).

A prospective new Authorized Supervisor (or Supervisors proposing new uses of radioisotopes) will meet with the RSO and provide information concerning the proposed use of material, the quantity and form requested, potential radiological hazards associated with such use and mechanisms for external and internal exposure control, contamination controls and waste disposal. If not already done, applicants will submit a written summary of their previous education, including radiochemical experience and training. Authorized Supervisors will possess a college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering.

Prior to approving a new Authorized Supervisor or the new use of radioactive material, the RSO will ensure adequate:

- 1) Training and experience of Authorized Supervisors;
- 2) Facilities and equipment for each specific use;
- 3) Control of procurement and use of byproduct material; and,
- 4) Material handling and operating procedures including provisions for requiring users to conduct surveys to confirm that radiation levels and/or contamination levels are within specific guidelines. The type and frequency of surveys must take into consideration the amount and types of radioactive material used or being stored.

These safety evaluations will be reviewed, approved and recorded by the RSO prior to the actual use of licensed radioactive material.

8. TRAINING REQUIRED FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

Individuals who will be working with licensed radioactive material or frequenting restricted areas will receive radiation safety training. Individuals may not work with radioactive material under this license or enter restricted areas until they have completed this training.

Radiation safety training will be provided: (1) prior to personnel first working with licensed radioactive material at Connecticut College; (2) annually (refresher); and (3) whenever a significant change occurs in duties, material use, or the license.

Training of Authorized Supervisors will be conducted by the RSO or other qualified individual (e.g., health physics consultant). Training of students working under the Authorized Supervisor will be provided by the Authorized Supervisor, the RSO or another qualified individual.

Training will be provided using a combination of in-person training and on-line training. Learning proficiency may be evaluated by methods including, but not limited to, quizzes, hands-on demonstrations, verbal responses or observations by the instructor.

B. Topics covered in training sessions will include information such as:

- 1) Fundamentals of radiation safety
 - a) characteristics of radiation

- b) units of measure
 - c) dosimetry
 - d) biological effects
 - e) dose minimization (ALARA)
- 2) Applicable regulations and license conditions
 - 3) Radiological survey program
 - 4) Ordering and receipt of radioactive materials
 - 5) Areas where radioactive materials are used or stored
 - 6) Dosimetry program
 - 7) Appropriate radiation safety procedures
 - 8) Potential hazards associated with radioactive material in each area where the individual will work
 - 9) Radiation Safety Manual
 - 10) Radioactive waste disposal
 - 11) Individual's obligation to report unsafe conditions to the RSO
 - 12) Appropriate response to emergencies or unsafe conditions
 - 13) Worker's right to be informed of occupational radiation exposure and bioassay results
 - 14) Emergency procedures
 - 15) Sealed Sources
 - 16) Location where individuals may find a copy of the license and applicable regulations
- C. Training will be documented and records retained as required by applicable regulations. These records will include the:
- 1) name of the individual conducting the training;
 - 2) names of the individuals attending the training;

- 3) date and duration of the training session; and
 - 4) topics covered.
- D. Ancillary Personnel whose duties may require them to work in the vicinity of radioactive material will be informed about the applicable radiation hazards and appropriate precautions.

8. FACILITIES AND EQUIPMENT

A. Facilities

- 1) Areas in which radioactive materials will be used will be pre-approved by the RSO. This work would typically be carried out in a laboratory and would involve only microcurie amounts of radioactive material.
- 2) The laboratory areas typically have vinyl tile or polymer-coated floors and epoxy-painted walls. These laboratories may also contain bio-safety cabinets (BSC's) and fume hoods in which licensed material may be used. Ventilation in these areas is designed to provide between 6 - 12 air exchanges per hour.
- 3) Areas are protected by fire detection and sprinkler systems. Smoke detectors are hardwired into the fire alarm system, which is linked to the city fire department.
- 4) Prior to beginning work with radioactive materials, the Authorized Supervisor must obtain written approval from the RSO. During the registration process, a number of items are discussed such as the supervisor's responsibilities, applicable rules and regulations, survey methods and frequency, waste disposal, personnel dosimetry, as well as a review of the training and experience of the supervisor and laboratory personnel. The RSO will assist in setting up the proposed work areas to ensure that proper shielding, survey meters, labeling, dosimetry, material storage, containment, and waste disposal provisions are met. Appendix K of NUREG-1556 Volume 11, "Program-Specific Guidance about Licenses of Broad Scope" will be used as guidance.

B. Equipment

- 1) Instrumentation – Connecticut College will maintain survey instrumentation on site necessary to detect the various radioisotopes possessed under the license. Examples of instrumentation currently possessed are provided below.

TABLE OF RADIATION DETECTION INSTRUMENTATION

Model	Type	Range	Window Thickness
Ludlum Model 3 with 44-9 (or equivalent) Alpha/Beta/Gamma Detector	GM	0 to 600,000 cpm	1.7 mg/cm ² mica
Ludlum Model 3 with 44-3 (or equivalent) Low Energy Gamma Scintillator	NaI Scintillation	0 to 600,000 cpm	15 mg/cm ² aluminized mylar
Beckman LS 6500 (or equivalent)	Liquid Scintillation	0 – 10E+6 dpm (MDA ≈ 50 dpm)	N/A

Survey Instrument Calibration

Instrumentation used to demonstrate compliance with regulatory requirements will be calibrated at least annually, and following repair.

Portable instrumentation will be sent off site to an appropriately licensed organization for calibration. An example of an organization that may be used is Radiation Safety and Control Services of Stratham, NH (License No. 381R).

Liquid scintillation counters will be calibrated on site using traceable standards in accordance with manufacturer's guidelines.

- 2) Fume Hoods - Any work with radioactive material that could cause any appreciable airborne activity (e.g., volatile compounds) will be done in a properly functioning fume hood or glove box. The ventilation flow rates for enclosures in which licensed materials are used will be verified at least annually. The minimum face velocity of each fume hood will be 100 fpm.

- 3) Protective Equipment – Connecticut College will also utilize various forms of equipment to assist in maintaining radiation doses ALARA. Examples of the equipment that may be utilized include:
 1. Lead shielding;
 2. Plexiglas shielding;
 3. Rad trays; and
 4. Remote handling devices.

9. RADIATION SAFETY PROGRAM

A. Program Audit

The RSO is responsible for ensuring that the radiation program content and implementation is reviewed (audited) at least annually. This audit may be performed by the RSO or by a qualified outside consultant or organization. This program audit will be fully documented.

The RSO will take appropriate actions when noncompliance is identified, including analysis of the cause, corrective actions, and actions to prevent recurrence.

B. Procurement of Radioactive Material

The RSO will approve all orders for radioactive material in writing and will ensure that the requested material and quantities are authorized by the license and that the possession limits are not exceeded.

Connecticut College has procedures in place to manage radioactive material inventory and use.

B. Package Receipt

Licensed radioactive material will be shipped to the RSO's attention. Radioactive material packages will be surveyed and opened by trained personnel, according to established safe opening procedures.

C. Material Inventory and Tracking

Connecticut College will develop and maintain a continuous record of all radioactive material possessed; from receipt to final disposition.

D. Security

Radioactive stock solutions will be secured against unauthorized use through the use of locked room doors, locked refrigerators/ freezers or through the use of lock boxes within refrigerators/freezers. Only individuals who have been appropriately trained and authorized will be granted access to this material.

E. Personal Monitoring (Dosimetry)

Individuals shall be monitored for radiation dose in accordance with 10 CFR 20.1502(a). Both whole body and finger monitors may be used, as appropriate. Individuals handling H-3 and C-14 will not be issued dosimetry, unless specifically requested by the user, while individuals handling high-energy beta or gamma emitters will be issued dosimetry.

Dosimetry will be exchanged at least quarterly. Dosimetry will be processed by a company holding current personnel dosimetry accreditation from the National

Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; such as Mirion Technologies of Irvine, CA.

It is not anticipated that radionuclides will be used in quantities that would necessitate bioassays.

F. General Safety Rules for the Safe Use of Radioactive Materials

- 1) The general safe laboratory practices that are required in any laboratory are applicable in a radiological laboratory
- 2) Wear protective clothing (i.e., safety glasses, lab coat and disposable gloves) whenever handling radioactive materials.
- 3) Do not eat, drink, smoke or apply cosmetics in any area where licensed material is stored or used.
- 4) Wear personnel monitoring devices, if required, at all times while in areas where licensed materials are used or stored.
- 5) Check your work area for contamination frequently; before work begins, during work process, upon completion of the task. Do not cross-contaminate research. Use wipes in addition to instrument surveys.
- 6) Wash hands after handling radioactive materials.
- 7) Avoid direct contact with radioactive material.
- 8) Know the location of and how to use the survey instruments available.
- 9) Dispose of radioactive waste only in designated, labeled and properly shielded receptacles.
- 10) Never pipette by mouth.
- 11) Store radioactive solutions in clearly labeled containers.
- 12) Secure stock solutions when not under the constant surveillance and immediate control of the user(s).

G. Emergency Procedures

Examples of the emergency procedures that may be utilized at Connecticut College are provided below.

1) Minor Spills of Liquids and Solids

A minor spill involves the spill of radioactive material in such quantities (typically ≤ 1 mCi) that there is no radiation hazard created, either internal or external. There is also no airborne contamination present.

- a) Notify persons in the area that a spill has occurred.
- b) Prevent the spread of contamination by covering the spill with absorbent paper. (Paper should be dampened if solids are spilled).
- c) Clean up the spill, wearing disposable gloves and using absorbent paper.
- d) Carefully fold the absorbent paper with the clean side out and place in a plastic bag for transfer to a radioactive waste container. Put contaminated gloves and any other contaminated disposable material in the bag.
- e) Survey the area with an appropriate low-range radiation detector survey meter or other appropriate technique. Check the area around the spill for contamination. Also check hands, clothing, and shoes for contamination.
- f) Report the incident to the RSO promptly.
- g) Allow no one to return to work in the area unless approved by the RSO.
- h) Cooperate with and follow the instructions of the RSO (e.g., investigation of root cause, provision of requested bioassay samples).

2) Major Spills of Liquids and Solids

A major spill of radioactive material is one that occurs in such quantities (typically > 1 mCi) that a significant internal or external radiation hazard risk is created.

- a) Clear the area. If appropriate, survey all persons not involved in the spill and vacate the room.
- b) Prevent the spread of contamination by covering the spill with absorbent paper (paper should be dampened if solids are spilled), but do not attempt to clean it up. To prevent the spread of contamination, limit the movement of all personnel who may be contaminated.
- c) Shield the source only if it can be done without further contamination or significant increase in radiation exposure.

- d) Close the room and lock or otherwise secure the area to prevent entry. Post the room with a sign to warn anyone trying to enter that a spill of radioactive material has occurred.
 - e) Notify the Campus Safety (x2222) and RSO immediately.
 - f) Survey all personnel who could possibly have been contaminated. Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water and then washing with a mild soap.
 - g) Allow no one to return to work in the area unless approved by the RSO.
 - h) Cooperate with and follow the instructions of the RSO (e.g., investigation of root cause, provision of requested bioassay samples).
- 3) Incidents Involving Radioactive Dusts, Mists, Fumes, Organic Vapors, and Gases
- a) Notify all personnel to vacate the room immediately.
 - b) Shut down ventilation system, if appropriate, to prevent the spread of contamination throughout system and other parts of facility.
 - c) Vacate the room. Seal the area, if possible.
 - d) Notify the Campus Safety (x2222) and RSO immediately.
 - e) Ensure that all access doors to the area are closed and posted with radiation warning signs, or post guards (trained) at all access doors to prevent accidental opening of the doors or entry to the area.
 - f) Survey all persons who could have possibly been contaminated. Decontaminate as directed by the RSO.
 - g) Promptly report suspected inhalations and ingestions of licensed material to the RSO.
 - h) Decontaminate the area only when advised and/or supervised by the RSO.
 - i) Allow no one to return to work in the area unless approved by the RSO.
 - j) Cooperate with and follow the instructions of the RSO (e.g., investigation of root cause, provision of requested bioassay samples).

4) Fires or Explosion

- a) Immediately attempt to put out the fire by approved methods (i.e., fire extinguisher) if this can be done safely.
- b) Notify all persons present to vacate the building and immediately pull the nearest fire alarm.
- c) Have one individual immediately dial Campus Safety (x2222) and notify personnel of the emergency. State the nature of the emergency and the location of the emergency – building, floor, and room number.
- d) If a potentially significant radiological hazard is present in the affected area, inform the emergency responders upon their arrival.
- e) Once the fire is out, isolate the area to prevent the spread of possible contamination.
- f) Survey all persons involved in combating the fire for possible contamination.
- g) Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water, then washing with a mild soap.
- h) In consultation with the RSO, determine a plan of decontamination and the types of protective devices and survey equipment that will be necessary to decontaminate the area.
- i) Allow no one to return to work in the area unless approved by the RSO.
- j) Cooperate with and follow the instructions of the RSO (e.g., investigation of root cause, provision of requested bioassay samples).

H. Radiological Surveys

Areas will be surveyed at reasonable intervals, depending on the amount and type of radioactive material used, and the nature and frequency of work.

“Reasonable intervals” will be deemed to be at least monthly in areas where radioactive materials are used and/or stored. The immediate areas (e.g., bench tops) in which loose radioactive materials are being used will be checked for contamination at least once daily by the Authorized Users in the laboratory. More extensive surveys will be performed at the completion of an experiment or if contamination is suspected.

The required monthly survey will be properly documented in appropriate units. Daily surveys performed by laboratory personnel will only be required to be documented if contamination is identified.

Contamination levels throughout Connecticut College will be maintained ALARA. The maximum contamination levels authorized in unrestricted areas are as follows:

Acceptable Surface Contamination Levels

Nuclide	Average (dpm/100 cm ²)	Maximum (dpm/100 cm ²)	Removable (dpm/100 cm ²)
I-125, I-129	100	300	20
I-131, Sr-90	1,000	3,000	200
Beta-gamma emitters other than those emitted above	5,000	15,000	1,000

Dose equivalent rates above the levels stated below will be considered excessive unless they are of short duration, or, in the case of restricted areas, unless other steps are taken to limit personnel exposure. Barring these exceptions, action will be taken to reduce the dose equivalent rates as far as reasonably achievable below the levels identified below.

Acceptable Dose Equivalent Levels

Area	Action Level
Restricted	2.0 mrem/hour
Unrestricted	0.5 mrem/hour

I. Leak Testing

Leak testing of sealed sources will be conducted at the frequency specified by the manufacturer or every six months, whichever is less frequent, in accordance with the following procedure.

- 1) For each source to be tested, list identifying information such as the manufacturer, model number, serial number, radionuclide, and activity.
- 2) If available, use a survey meter to monitor exposure.
- 3) Prepare a separate wipe sample (e.g., cotton swab or filter paper) for each source.
- 4) Number each sample to correlate with identifying information for each source.

- 5) Wipe the most accessible area (but not directly from the surface of the source) where contamination would accumulate if the sealed source was leaking.
- 6) Select an instrument that is sensitive enough to detect 0.005 microcuries of the radionuclide (e.g., liquid scintillation counter) and ensure that its calibration is current.
- 7) Determine the efficiency of the detector for the isotope to be analyzed.
- 8) Using the selected instrument, count and record the background count rate.
- 9) Count the sample and record results in units of uCi.

10. RADIOACTIVE WASTE MANAGEMENT

All radioactive waste collection and disposal at Connecticut College is carried out under the supervision of the Radiation Safety Officer (RSO). Connecticut College has developed, implemented and maintains written waste disposal procedures for radioactive material.

- A) Radioactive waste will be disposed of:
- 1) through transfer to an authorized recipient;
 - 2) through disposal to the sanitary sewer system, in accordance with the requirements described in 10 CFR 20.2003;
 - 3) through decay-in-storage; or,
 - 4) as liquid scintillation medium or animal carcasses/tissue in accordance with the requirements described in 10 CFR 20.2005.
- B) The procedure for sanitary sewer disposal is enclosed as Attachment C and the procedure for decay-in-storage is enclosed as Attachment D.
- C) Any release of radioactive material into the air and water will conform to the requirements described in 10 CFR 20.1302(b)(2).
- D) Transportation of licensed radioactive materials will be in accordance with 10 CFR Part 171 and the U.S. Department of Transportation (DOT) regulations.

Attachment A

**RSO Qualifications and
Delegation of Authority Letter**



CONNECTICUT COLLEGE

Steven R. Langlois
Director, Environmental Health & Safety
Work: (860) 439-2252
Cell: (860) 625-5268

Education

██████ B.S. Liberal Studies – Regents College

██████ M.S. Occupational Safety & Health Management – University of New Haven

1998 40-hour Radiation Safety Officer Training – Radiation Safety Control Services, Inc.

Related Work Experience

1998 – 2017 - Assistant RSO

- RAM receipt surveys
- RAM inventory
- Swipe Surveys/LSC analysis
- RAM Waste Disposal
- Linear Accelerator and X-ray Diffractometer surveys
- RAM training for ancillary personnel/students

1998 – Present - Director, Environmental Health & Safety

- RCRA/DOT Hazardous Waste Compliance
 - Waste Determination/sampling
 - Training
 - Waste disposal
 - Manifesting/recordkeeping
 - Biohazardous Waste Management & Compliance
- OSHA Employee Safety Compliance
 - Policy development
 - Training
 - Workplace Hazard Surveys
 - Accident Investigations
- Laboratory Safety
 - Inspections
 - Training
 - Fume Hood Certifications

**PERSONAL INFORMATION WAS REMOVED
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CONNECTICUT COLLEGE

Memorandum

From: Richard Madonna

To: Steven R. Langlois

Subject: RSO Delegation of Authority

You, Steven Langlois, have been appointed Radiation Safety Officer and are responsible for ensuring the safe use of radiation. You are responsible for managing the Radiation Protection Program; identifying radiation protection problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; stopping unsafe activities; and ensuring compliance with regulations. You are hereby delegated the authority necessary to meet those responsibilities, including prohibiting the use of byproduct material by employees who do not meet the necessary requirements and shutting down operations where justified to maintain radiation safety. You are required to notify management if staff does not cooperate and does not address radiation safety issues. In addition, you are free to raise issues with the United States Nuclear Regulatory Commission (U.S.NRC) at any time. It is estimated that you will spend approximately 4 hours per month conducting radiation protection activities.

Richard Madonna
Vice President for Finance and Administration

5/3/2018

Date

I accept the above responsibilities,

Steven Langlois
Radiation Safety Officer

5/3/2018

Date

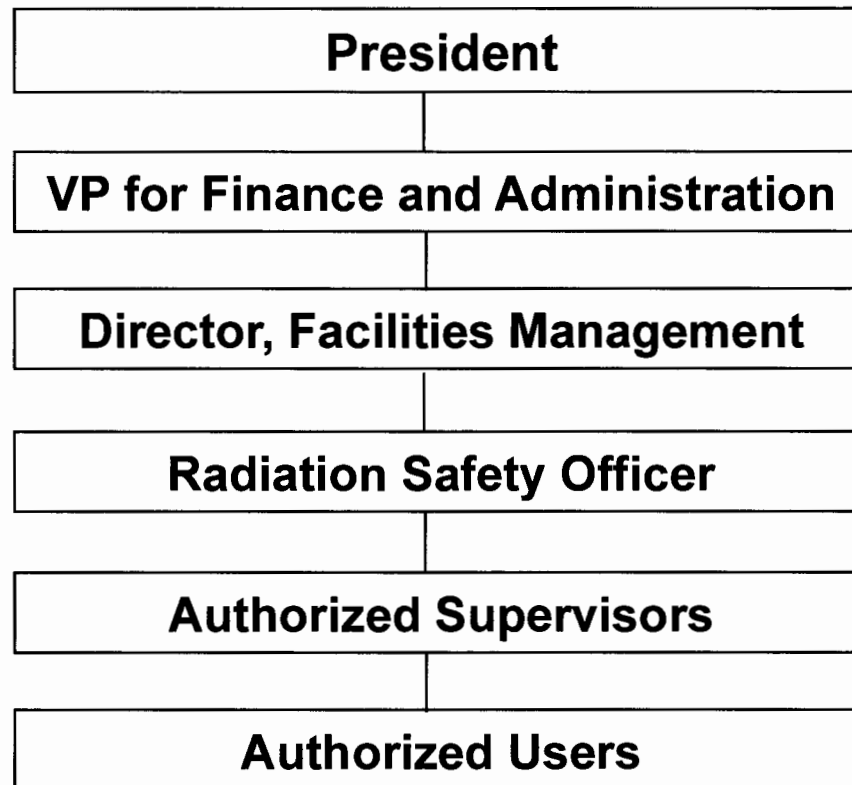
cc: Affected Department Chairs

Attachment B

Organizational Chart

Connecticut College

Radiation Safety Organizational Chart



Attachment C

Sanitary Sewer Disposal Procedure

Sanitary Sewer Disposal

- 1) Liquid radioactive waste may only be disposed of to properly designated and authorized sinks.
- 2) Confirm that the liquid waste being discharged is soluble (or is biological material that is readily dispersible) in water. (See NRC Information Notice No. 94-07.)
- 3) Calculate the amount of each radionuclide that can be discharged by using the information from prior, similar discharges and the information in 10 CFR Part 20, Appendix B.
- 4) Make sure that the amount of each radionuclide does not exceed the monthly and annual discharge limits specified in 10 CFR 20.2003(a)(4) and 10 CFR Part 20, Appendix B, Table 3 (records for individual users/laboratories).
- 5) If more than one radionuclide is released, the sum of the ratios of the average monthly discharge of a radionuclide to the corresponding limit in 10 CFR Part 20, Appendix B, Table 3 must not exceed unity.
- 6) Confirm that the total quantity of licensed material released into the sanitary sewerage system in a year does not exceed 5 Ci of H-3 (tritium), 1 Ci of C-14, and 1 Ci of all other radionuclides combined.
- 7) Discharge liquid waste slowly to minimize splashing with water running, to be sure that the material moves out of the sink and into the sewer system.
- 8) Record the isotope and activity disposed on the rad sink disposal log sheet.
- 9) Survey the sink and surrounding work surfaces to confirm that no residual material or contamination remained in the sink or on work surfaces.
- 10) Decontaminate all areas or surfaces if found to be contaminated.

Attachment D

Decay-In-Storage Procedure

DECAY IN STORAGE PROCEDURE

Short-lived radionuclides with a half-life less than 120 days may be decayed-in-storage. This waste must be stored until radiation levels are indistinguishable from normal background levels. For decay-in-storage, the following procedure will be followed.

- 1) Package short-lived waste in an appropriate bag or container.
- 2) Label the container with radioactive material label, the isotope, activity, initial radiation readings and start date.
- 3) Store the waste in an appropriate location to allow for decay. Provide adequate shielding to ensure that area dose-rate readings do not exceed 2 millirem per hour.
- 4) The container will remain in storage until such time as the radiation levels decrease to a level which is indistinguishable from normal background levels (e.g., 10 half-lives).
- 5) Inspections of containers in storage will be performed along with radiological surveys of the storage area. Any container that appears to be degrading will be repackaged.
- 6) When it is believed that the waste has fully decayed the waste may be released using the following procedure:
 - a. Obtain an appropriate survey instrument for the radioisotope of concern and verify its proper operation.
 - b. Plan to monitor in a low background level (<0.05 mR/h) area.
 - c. Remove any shielding from around the container.
 - d. Monitor all surfaces of each individual container.
 - e. If the radiation level measured on the waste is indistinguishable from background, the material may be disposed of without regard to radioactivity. Ensure that all radioactive labels are removed prior to disposal.
 - f. Record the final radiation readings, date and initials of the surveyor.
 - g. Waste with activity noticeable above background must be returned to the storage area for further decay.



ACKNOWLEDGEMENT - RECEIPT OF CORRESPONDENCE

Name and Address of Applicant and/or Licensee Connecticut College Attn: Richard Madonna VP for Finance and Administration 270 Mohegan Avenue New London, CT 06320-4196	Date 05/15/2018
	License Number(s) Docket # 03039110
	Mail Control Number(s) 608770
	Licensing and/or Technical Reviewer or Branch Comm, Industrial, R&D, and Academic Branch

This is to acknowledge receipt of your: Letter and/or Application Dated: 05/03/2018

The initial processing, which included an administrative review, has been performed.
 Amendment Termination New License Renewal

There were no administrative omissions identified during our initial review.

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Your application for a new NRC license did not include your taxpayer identification number. Please complete and submit NRC Form 531, Request for Taxpayer Identification Number, located at the following link: <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc531.pdf>
 Follow the instructions on the form for submission.

The following administrative omissions have been identified:
 [Empty box for listing omissions]

Your application has been assigned the above listed MAIL CONTROL NUMBER. When calling to inquire about this action, please refer to this control number. Your application has been forwarded to a technical reviewer. Please note that the technical review, which is normally completed within 180 days for a renewal application (90 days for all other requests), may identify additional omissions or require additional information. If you have any questions concerning the processing of your application, our contact information is listed below:

Region I U. S. Nuclear Regulatory Commission Division of Nuclear Materials Safety 2100 Renaissance Boulevard, Suite 100 King of Prussia, PA 19406-2713 (610) 337-5260, (610) 337-5313, (610) 337-5398, or (610) 337-5239
