

RI-43

AUTHORIZATIONS FOR RADIATION USE

PURPOSE

This procedure provides a standardized format for documenting the evaluation and authorization of new or amended radiation uses by the Radiation Safety Committee (RSC), and for notifying users of their authorizations.

RULES AND REGULATIONS

All uses of radioactive material or ionizing producing machines at CSU are required to be overseen by a Radiation Safety Committee and implemented by the Radiation Control Office (RCO). Evaluations of these uses are initiated by submitting an application for approval by the RSC. The RCO shall notify the applicant promptly of the action taken by the RSC.

EVALUATION OF APPLICATIONS

Evaluations by the RCO and the RSC are intended to:

1. Ensure that the intended use meets the requirements of the license(s) and regulations;
2. Ensure that the individuals have the appropriate training and experience to use the requested material(s) safely;
3. Ensure that the applicant's facilities, security and equipment are adequate for the proposed work;
4. Verify that the procedures are based on the ALARA principle;
5. Verify that dose limits will not be exceeded while performing the procedures;
6. Ensure minimal production and optimum segregation of radioactive wastes;
7. Evaluate the monitoring methods for external or internal radiation exposures;
8. Ensure that the appropriate postings and warnings are in place.

PROCEDURES FOR APPLICATION RECEIPT, DISTRIBUTION, APPROVAL OR REJECTION

Applications received by the Radiation Control Office will be logged onto form RF-43D "Application Receipt and Number Assignment". Application numbers are assigned as follows:

96R-001-01

Where:

96 - the year the application was received

R - radiation project application

001 - the 1st, 2nd, etc. application received in the year

01 - the version of the application. The version may change when an amendment to an existing application is approved by the RSC.

If a courtesy review is received, the application number is recorded as "Courtesy Review".

A "Radiation Control Office Project Review Log Sheet" (RF-43E) form will be initiated for each application to assist in compiling reviews by the RCO and the RSC. A "Radiation Project Evaluation by the Radiation Control Office" (RF-43A) form will be completed for each application by the RCO. A "Radiation Safety Committee Project Evaluation" (RF-43B) form will be completed by the RSC member. A guide for Performing Radiation Project Evaluations can be located in Appendix A. Upon approval of the radiation project application, a "Radioactive Materials Use Approval" (RF-43C) form will be completed and sent to the Principal User. This form will have all the conditions required by the RSC that need to be met for use of the radioactive material or ionizing producing machines submitted in the application. The RCO will ensure these conditions are met.

Applications for renewal of previous projects will be evaluated using form RF-43F. This information will be presented to the RSC for review.

Principal Users will be informed 6 and 3 months in advance of their project expiration.

RF-43A RADIATION PROJECT EVALUATION BY THE RADIATION CONTROL OFFICE

Radiation Project No. Courtesy Review

PU _____

(Please type or print clearly)
(Page 1 of 4)

Application Section	Additional Information		Specifics			Status			
INTRODUCTION	Written by PU		State purpose of using RAM			Complete			
			Overall objectives of the research			Complete			
			Benefits to the scientific community and CSU (opt)			Complete			
APPLICATION			Pertinent RF-2 forms submitted, completed, signed			Complete			
PERSONNEL	RF-1A; and 1B		Must be completed and in personal file for workers			Complete			
	Classification		List of workers with classification			Complete			
	Training		Demonstrated that the required training has been completed by all workers			Complete			
Last Name	RF-1A/1B	Worker	Modules Attended	Modules Remaining	Isotope / Limit (mCi)				
	Complete ?	Class	(Alt. Training)	(Required)					
PU:	<input type="checkbox"/>	N/A							
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	
	<input type="checkbox"/>	N/A			N/A	N/A	N/A	N/A	

RF-43A RADIATION PROJECT EVALUATION
 BY THE RADIATION CONTROL OFFICE (Cont.)

Radiation Project No. Courtesy Review

PU _____

(Please type or print clearly)
 (Page 2 of 4)

LOCATION	Master Layout	Diagrams of all labs using RAM and storage	N/A
	Layout of RAM Use	Diagrams show locations where RAM is used	Complete
		Diagrams show locations where RAM is stored	Complete
	Wipe Test Locations	Floors and doors included	Complete
		Counter tops included	Complete
		Use and storage areas included	Complete
		Approximate locations shown	Complete
	Security	Frequency of wipes adequate	Complete
		Demonstration that RAM is secured and only accessible to authorized users	Complete
		Doors locked to labs when not in use	Complete
		RAM stored in locked fridge or lock box, etc.	Complete
FACILITIES INSPECTIONS			
Location	Last RCO Inspection	Results and Comments	RCO Survey before Approval Check for Yes
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
PROCEDURES	Radioactive Material	Radionuclides and chemical forms listed	Complete
	Procedures	Procedures and amounts used in experiments given in clear layman's terms	Complete
		Mixed waste justification adequate	Complete
	Precautions	Lab safety discussed and appropriate	Complete
	Safety	Normal dose calculations adequate	Complete
		Worst case dose calculations adequate	Complete
		Personal monitoring discussed and appropriate	Complete
	Waste Disposal	Containers adequate	Complete
		Elimination of biohazards discussed and adequate	Complete
		Disposal of short lived RAM discussed and adequate	Complete
Disposal of mixed waste discussed and adequate		Complete	
		Sink disposal discussed and adequate	Complete
SURVEY INSTRUMENTS		Appropriate instrument for type of RAM	Complete
		Second survey meter available	Complete
		QA/QC for meters demonstrated	Complete
		LSC available for ³ H counting	Complete
RADIATION SAFETY	Postings	Notification to Workers posted at entrance to lab	Complete
		ALARA statement provided and adequate	Complete
		Entrance posted with emergency contacts and appropriate warning	Complete
		Work areas posted correctly	Complete
		Storage locations posted appropriately	Complete
		Instruments posted appropriately	Complete

RF-43B RADIATION SAFETY COMMITTEE PROJECT EVALUATION

Radiation Project No.

PU _____

Committee Member – Please Print Name

Committee Member Project Review

- Item #1: Did the PU state the purpose, objectives and benefits of using the RAM? Yes No
- Item #2: Was the training and experience adequate for the personnel listed? Yes No
- Item #3: Were the location diagrams showing RAM use and storage areas and wipe test locations adequate? Yes No
- Item #4: Was security addressed adequately? Yes No
- Item #5: Did the RCO have any comments or concerns that you think need to be addressed before approval? Yes No
- Item #6: Was the type of material, the procedures, precautions, safety and waste disposal adequately addressed? Yes No
- Item #7: Are the survey and counting instruments appropriate? Yes No
- Item #8: Were postings addressed adequately? Yes No
- Item #9: Was the application complete? Yes No

Comments – Corrective Action

Page Item	Committee Member Comment / Condition

Interview / Lab Visit		
Person Contacted	Date	Comments

MEMBER RECOMMENDATION	
I have carefully reviewed the application materials for this radiation use and recommend the following action.	
<input type="checkbox"/> APPROVAL	Committee Member Signature
<input type="checkbox"/> Conditional – See Item(s):	
<input type="checkbox"/> HOLD – Discuss by Full Committee	
<input type="checkbox"/> DISAPPROVE – See Item(s):	
Date Reviewed:	

**Colorado State University
Radiation Safety Committee**

RF-43C RADIOACTIVE MATERIALS USE APPROVAL

Pursuant to the Colorado State University *RADIATION CONTROL MANUAL*: as amended, and the State of Colorado *Rules and Regulations Pertaining to Radiation Control*, and under License No. 002-19 and/or 02-27 granted by the State of Colorado; an approval is hereby issued authorizing such Principal User(s) to receive, possess and use the radioactive material(s), by the person(s) at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the Colorado State University Radiation Safety Committee and of the Colorado Department of Public Health and Environment and to any conditions specified below.

Principal User (PU):

1. Name: “Principal User Name”	3. In accordance with the application or amendment materials and statements dated “xx xx xx” submitted to the CSU Radiation Safety Committee, an approval is hereby granted. Any previous approval is amended in its entirety.
(Use this name on all correspondence with the Radiation Control Office)	
2. Address: Department Address	4. Expiration Date: “day month year”
Colorado State University	
Fort Collins, CO 80523	5. Approval No: xxR-xxx-xx

6. Radioactive Material	7. Physical and Chemical forms	8. Maximum quantity PU may possess at any one time
A. “Isotope Name – Mass Number”	A. “Solid, Liquid, Gas, Chemical Compound”	A. “xx.xx millicuries
B.	B.	B.
C.	C.	C.
D.	D.	D.

9. Name	10. Work authorized with radioactive materials	11. Authorized to work with maximum activity of
A. “Principal User Name”	A. Principal User, all uses	A. Item 6.A. “Full Activity Amnt.” Item 6.B. “Full Activity Amnt.” Item 6.C. “Full Activity Amnt.” Item 6.D. “Full Activity Amnt.”
B. “Qualified User Name”	B. Qualified User(s)	C. Item 6.A. “½ Activity Amnt.” Item 6.B. “½ Activity Amnt.” Item 6.C. “½ Activity Amnt.” Item 6.D. “½ Activity Amnt.”
C. “Normal User Name”	C. Normal User(s)	D. Item 6.A. “¼ Activity Amnt.” Item 6.B. “¼ Activity Amnt.” Item 6.C. “¼ Activity Amnt.” Item 6.D. “¼ Activity Amnt.”
D. “Ancillary User Name”	D. Ancillary User(s)	D. Item 6.A. thru 6.D. 0.0 millicuries

12. Location	13. Radionuclides	14. Uses
A. “Building, Room No.”	A. “Items 6.A., 6.B., etc.	A. “Radioactive Materials Storage, Handling, etc.
B.	B.	B.
C.	C.	C.
D.	D.	D.

CONDITIONS

- 15. Radioactive material(s) authorized in Item 6 to be used for research as defined in RH 1.4 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*.
- 16. Radioactive material(s) may not be transferred to or from the inventory of the PU without prior approval of the Colorado State University Radiation Control Office.
- 17. Radioactive material quantities listed in Item 8 include the inventory associated with radioactive waste.
- 18. Radioactive material(s) authorized in Item 6 to be used only in Colorado State University building(s) and room(s) authorized in Item 12.
- 19. Locations authorized in Items 12 to remain locked while unoccupied by person(s) listed in Item 9. If rooms cannot be locked, then all radioactive material (including waste) must be locked within a freezer or cabinet when authorized person(s) listed in Item 9 are not present.
- 20. Swipe tests shall be performed at location(s) specified in Item 12 at a frequency of once per day when greater than 30 ALIs of isotope(s) are used; once per week when greater than 1 ALI of isotope(s) are used; and once per month when less than 1 ALI of isotope(s) are used.
- 21. Transportation of radioactive material(s) authorized in Item 6 shall be subject to all applicable regulations of the Colorado and US Department of Transportation, and other agencies of the United States having jurisdiction. The PU must be in compliance with the requirements relating to packaging of the radioactive material, marking and labeling of the package, placarding of the transport vehicle, and accident reporting set forth in the regulations of the US Department of Transportation.
- 22. Radioactive materials shall not be used in or on human beings, in or on animals, or in products distributed to the public.
- 23. Except as specifically provided otherwise by this approval, the Principal User shall possess and use radioactive material described in Items 6, 7 and 8 of this approval in accordance with statements, representations, and procedures contained in:
 - A. The Radiation Project Description submitted in *month year*;
 - B. The Colorado State University *RADIATION CONTROL MANUAL*.
- 24. The following personnel need to complete training prior to use of radioactive material(s). Failure to complete training will be cause for termination of PU license or removal from PU project.

Name	Module	Must Complete by
Qualified Users	0, 1, 2, 3, 5	Prior to use
Normal Users	0, 1, 2	Prior to use
All Users	4	Within one month of training
Ancillary Personnel	0	Prior to working in Lab(s)

- 25. **FAILURE TO COMPLETE THE REQUIRED TRAINING BY THE DATE LISTED WILL RESULT IN A REPORT TO THE RADIATION SAFETY COMMITTEE.** THE COMMITTEE MAY EXERCISE SEVERAL OPTIONS INCLUDING TERMINATION OF YOUR RADIATION LICENSE IF TRAINING IS NOT COMPLETED. **PLEASE CONTACT THE RCO IF THE DEADLINE MEETS WITH EXTENUATING CIRCUMSTANCES.**

- 26. All personnel listed in Item 9 are required to read the Principal User’s Radiation Safety Plan. Persons listed in Item 9 are instructed to sign the attached roster indicating that the document has been read and understood. Any new personnel acquired after this approval has been issued are required to do the same.
- 27. Use of radioactive materials is permitted in accordance with the University’s radioactive materials license(s). Such use is designated for University individuals acting in their official University capacity. The University does not cover non-University consulting or private activities unless a Memorandum of Understanding (MOU) is approved by CSU for the consulting or private activities that specifically address the radioactive materials and/or ionizing producing machines.
- 28. “Any specific conditions specifically applied by the Radiation Safety Committee”.

FOR THE COLORADO STATE UNIVERSITY RADIATION SAFETY COMMITTEE

Date _____ By _____
James P. Abraham, Radiation Safety Officer

ACKNOWLEDGEMENT OF RECEIPT OF APPROVAL

The Principal User must carefully read and acknowledge receipt and approval of this document by signing below and mailing a copy of this page only to the CSU Radiation Control Office, General Services Building – 6021. Keep a copy for your records.

Date _____ By _____
Principal User

**Colorado State University
Radiation Safety Committee**

RF-43C IONIZING RADIATION USE APPROVAL

Pursuant to the Colorado State University *RADIATION CONTROL MANUAL*: as amended, and the State of Colorado *Rules and Regulations Pertaining to Radiation Control*, and under the individual registration issued by the State of Colorado; an approval is hereby issued authorizing such Principal User(s) to, possess and use the radiation generating machines, by the person(s) at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the Colorado State University Radiation Safety Committee and of the Colorado Department of Public Health and Environment and to any conditions specified below.

1. Name:	Principal User (PU): “Principal User’s Name” (Use this name on all correspondence with the Radiation Control Office)	3. In accordance with the application or amendment materials and statements dated xx xx xx submitted to the CSU Radiation Safety Committee, an approval is hereby granted. Any previous approval is amended in its entirety.
2. Address:	Department Address Colorado State University Fort Collins, CO 80523	4. Expiration Date: “day month year” 5. Approval No: “xxR-xxx-xx”

6. X-Ray Unit Description	* Model No.	* Serial No.	7. Beam Energy mA(max)	CSU ID#
A.			A.	
B.			B.	
C.			C.	

* *Denotes model and serial numbers from the control panels of the x-ray units. Additional serial numbers for tube serial #, tube housing #, tube manufacture #, and tube model # are listed within the Radiation Safety Plan.*

8. Name	9. Use level (i.e., operator or x-ray user)
A. “PU Name”	A. Principal User, All Uses
B. “Name”	B. “X-Ray Operator(s), or User(s)”
C. “Name”	C. “Ancillary, No use permitted – remain > 6 ft. away when tube is in use

10. Location	11. Uses
A. “Building, Room No.”	A. “Machine Use, Storage, etc.”
B.	B.
C.	C.
D.	D.
E.	E.

CONDITIONS

12. X-Ray unit(s) authorized in Item 6 to be used for research and on animal patients, and follow all regulations contained in the State of Colorado *Rules and Regulations Pertaining to Radiation Control*. **These/this x-ray machine(s) are not authorized for human use, unless specifically approved by the Radiation Safety Committee and the State of Colorado.**
13. On all documentation for the use of the X-Ray machine(s) in item 6 (i.e., training, updates, etc.) refer to it with the appropriate CSU or VTH ID #.

14. The x-ray machine(s) may not be transferred to or from the inventory of the PU without prior approval of the Colorado State University Radiation Control Office.
15. Locations authorized in Items 10 to remain locked while unoccupied by person(s) listed in Item 8. If rooms cannot be locked, then all x-ray units must be locked within a cabinet when authorized person(s) listed in Item 8 are not present.
16. VTH faculty, staff, students, and *visitors* may designated to the VTH Radiation Safety Technician as their Principal User. The Radiation Control Office will train individuals commensurate with user or operator status depending on the particular groups' activities. However, the Radiation Safety Committee holds the Principal User of this approval responsible for specific training and supervision while rotating through the Principal Users area.
17. Owners are permitted to hold their own animals for x-ray procedures only in emergency situations. No radiation safety training is required from CSU.
18. All Operators must receive documented specific training on the x-ray unit(s) listed in Item 6 prior to use of the machine.
19. Except as specifically provided otherwise by this approval, the Principal User shall use the x-ray machine(s) described in Item 6 of this approval in accordance with statements, representations and procedures contained in:
 - A. The Radiation Project Description submitted in *month year*,
 - B. The Colorado State University *RADIATION CONTROL MANUAL*.
20. The Radiation Safety Committee holds the Principal User entirely responsible for the adequate safety training for all personnel involved with the x-ray unit listed in Item 6.
21. A technique chart will be provided in the vicinity of each x-ray machine. As new procedures develop for different techniques, technique charts will be updated to reflect the new procedures.
22. Written safety procedures listing individual projections where holding devices cannot be utilized will be initiated as new procedures develop for different techniques.
23. Copies of CDPHE parts 1, 2, 4, 6 and 10 must be available at all times.
24. A CDPHE approved state inspector must certify all x-ray units. These inspections are specified at the interval posted on the inspection sticker. It is the Principal User's responsibility to schedule and maintain inspections and compliance with this requirement from the CDPHE.
25. If components are replaced which affect or potentially affect a change in the radiation output, the Principal User must schedule a state inspection of the machine within 90 days of the replacement of the component(s). All new machines must be scheduled for a state inspection within 90 days of installation.
26. Use of x-ray machines is allowed in locations authorized in Item 10. In special circumstances where a mobile unit is used in locations not specified in this approval, the following procedures must be followed:
 - A. Use of the x-ray machine anywhere outside the State of Colorado may require a reciprocity agreement with appropriate authorities. The P.U. must give advance notice to the RCO by verbal communication at least 14 business days prior to use outside the State of Colorado. A copy of the reciprocity agreement will accompany the unit at all times.
 - B. Personnel who require radiation safety training prior to departure, must schedule training with the RCO no later than 7 business days prior to departure, and must be completed before departure. No one will be exempt from training requirements on any mobile x-ray unit.
 - C. Mobile X-ray units are permitted for use in any location where said approval has already been granted on another project. An operator must be granted permission by the P.U. for a given location to perform any procedures using the mobile x-ray unit. Furthermore, the operator must follow all rules set forth by the P.U. for

a given location. Failure to comply with the safety rules of a given location may be reported to the Radiation Safety Committee for further action.

- 27. All personnel listed in Item 8 are required to read the Principal Users Radiation Safety Plan. Person(s) listed in Item 8 are instructed to sign the following roster indicating that the document has been read and understood prior to any use. A copy of the radiation safety plan and signatures of all personnel must accompany any x-ray unit when it is used off-site. Any new personnel acquired after this approval has been issued are required to do the same.
- 28. The following personnel must complete the following training by the dates listed.

Name	Training / Documentation Required	Required Completion Date
X-ray Users	Modules 0, 4, 8	Prior to departure for Mobile x-rays and/or prior to any radiation work
X-Ray Operators	Modules 0, 4, 8 and documented instruction on use of specific x-ray machine	Prior to departure for Mobile x-rays and/or prior to any radiation work
VTH Junior & Senior Students	Module 9 and VM-714 and documented instruction on use of specific x-ray machine	Prior to any work with machine(s) in Item 6
All personnel	Module 4	Once every 3 years
Ancillary Users	Module-0	Prior to departure for Mobile x-rays and/or prior to entry into a radiation area

- 29. Failure to complete the required training listed in item 24 by the date listed above will result in a report to the Radiation Safety Committee. The Committee may exercise several options including termination of your radiation license if training is not completed. Please contact the RCO if the deadline meets with extenuating circumstances.
- 30. Use of x-ray machines is permitted in accordance with the University’s license(s) and/or registration(s). Such use is designated for University individuals acting in their official University capacity. The University does not cover non-University consulting or private activities unless a Memorandum of Understanding (MOU) is approved by CSU for the consulting or private activities that specifically address the radioactive materials and/or ionizing producing machines.

FOR THE COLORADO STATE UNIVERSITY RADIATION SAFETY COMMITTEE

Date _____ By _____
 James P. Abraham, Radiation Safety Officer

ACKNOWLEDGEMENT OF RECEIPT OF APPROVAL

The Principal User must carefully read and acknowledge receipt and approval of this document by signing below and mailing a copy of this page only to the CSU Radiation Control Office, Environmental Health Services -6021. Keep a copy for your records.

Date _____ By _____
 Principal User

RF-43E RADIATION CONTROL OFFICE PROJECT REVIEW LOG SHEET

Radiation Project No.

PU _____

Check Committee Member to Review Project

- Robert Handa (1-7130)
W214 A/Z Bld – 1672; rhanda@cvmb.colostate.edu
- Alternate – Colin Clay (1-7571)
W164 – ARBL – 1683; Colin.Clay@ColoState.edu
- Michael Pagliassotti (1-1390)
205 Gifford Bld –1571; Michael.Pagliassotti@Colostate.edu
- Alternate – Ken Allen (1-6712)
228 Gifford – 1571; Kenneth.Allen@ColoState.EDU
- John Zimbrick (1-7038)
122 A EHRHS -1681; john.zimbrick@ColosState.edu
- Alternate – Tom Borak (1-6450)
337 MRB – 1673; tborak@colostate.edu
- Paul Laybourn (1-5100)
127 MRB – 1870; Paul.Laybourn@ColoState.EDU
- Alternate – Laurie Stargell (1-5068)
241 MRB – 1673; lstargel@lamar.colostate.edu
- Joe VanCleave (1-1293)
G108 VTH-1620; jvanclea@colostate.edu
- Alternate – John Uhrig (1-4447)
G101 VTH – 1620; juhrig@lamar.colostate.edu
- Michael McNeil (1-1784)
Microbiology-1677; mmcneil@cvmb.colostate.edu
- Delphi Chatterjee (1-7495)
C320 Microbiology -1677; Delphi.Chatterjee@ColoState.edu
- Dean Crick (1-3308)
B310 Microbiology – 1677; dcrick@colostate.edu
- Carol Wilusz (1-6136)
B321 Microbiology – 1677; Carol.Wilusz@ColoState.edu

Application received by RCO

Application reviewed by RCO

Date Sent to Selected Committee Member

Date Review was Received from Committee Member

Final Action

Approved Conditional Disapproved

Approval sent to PU on date: _____

Acknowledgment received on date: _____

RF-43F RADIATION PROJECT APPLICATION RENEWAL

(This form to be completed by the Radiation Control Office)

Principal User:	Old Project Approval Number:
	New Project Number:
Renewal Application Submitted on: (date)	Renewal Application Completed on: (date)

Radiation Safety Plan

1. Have all conditions been addressed in the Project Approval? If not, what conditions need to be addressed:	Yes/No
2. Review of Project Application Checklist Complete? If not, what items of concern need to be addressed:	Yes/No
3. Have all personnel completed training? If not, which individuals need to complete training? <u>Person</u> <u>Modules</u> <u>Person</u> <u>Modules</u>	Yes/No
4. Is Personnel up to date with the Renewal Application	Yes/No
5. Complete Review of the Correspondence file Items of concern:	Yes/No
6. Complete Review of Inventory file (Inventory verification sent to P.U.)	Yes/No
7. Complete Review of Laboratory Inspections Contamination found (dates): Last wipe test by RCO (date): Items of concern	Yes/No
8. RF-2A and 2B complete for previous application	Yes/No
9. RF-1A completed and filed for all workers	Yes/No
10. Dose Calculations Adequate?	Yes/No
11. RF-43A Reviewed for previous project	Yes/No

P.U. File Reviewed by:

Approved			
Conditional			
Hold		James P. Abraham – R.S.O.	James C. Graham – A.R.S.O
Disapprove		Date Reviewed:	Date Reviewed:

APPENDIX A

Guidance for Performing Radiation Project Evaluations

The purpose of this document is to provide guidance to Radiation Safety Committee (RSC) members on how to conduct reviews of radiation project applications. The first section of this guidance will describe to the reviewer what to expect in a radiation project application package. The second section focuses on the actual review.

It should be noted that this document only provides guidance and is not intended to serve as a procedure. An application review should rely heavily on the reviewer's knowledge of the proposed work and the procedures the reviewer uses in their own radiation laboratory. It is intended that this guidance will be revised periodically to reflect changes in the review process and to capture ideas from RSC members that make the review process more efficient and more meaningful. Suggestions for improvements to this guidance can be made at the monthly RSC meetings or directly to the Chair of the RSC.

In order to reduce unnecessary duplication, an abbreviated version of Procedure RI-02 is provided as a companion document to this guidance document. Procedure RI-02 contains the instructions for completing a radiation project application that will be useful when performing reviews.

One purpose of the RSC review process is to ensure that at least one committee member has read and is familiar with each radiation project that is submitted to the RSC. As part of the broad scope license granted to Colorado State University (CSU), the Colorado Department of Public Health and Environment (CDHPE) requires that the RSC review each project and that the committee be knowledgeable of the radiation use at CSU. Therefore, knowledgeable reviews made by the RSC are a condition of CSU's license; if knowledgeable reviews are not conducted and the committee is not knowledgeable of the radiation use at CSU and the related safety requirements, the University could lose its license and the use of a valuable and powerful research tool. Since the RSC in essence represents the CDHPE as it conducts its business, it is especially important that the reviews be substantive and thorough. The CDHPE routinely audits CSU to ensure the quality of the reviews.

Another purpose of the RSC review is to ensure that the information included in the application is consistent with practices in the laboratory and that the application is complete. Finally, the RSC review demonstrates to Principal Users (PUs) that the RSC is actively involved in the radiation safety program at CSU.

THE RADIATION PROJECT REVIEW PACKAGE

Reviewers will be asked to review radiation project applications that are either within their department, that involve work of which the reviewer is cognizant, or that are closely related to the reviewer's area of radiation use. Review assignments are typically made by the Radiation Control Office (RCO) as they are received and reflect an effort to choose reviewers with

appropriate expertise. The projects requiring review are distributed as equitably as possible among all RSC members.

For each application, the reviewer will receive a package that contains a cover page (Form RF-43B) to be completed by the reviewer, one or more pages of comments associated with the courtesy review conducted by the RCO, and a copy of the most recent version of the Radiation Project Application, revised to address the courtesy review comments. Each of these parts of the application will be discussed in the following sections.

Knowledgeable RSC staff will have already reviewed each application package received by a reviewer. Therefore, the RSC review process should focus on the actual work involved with radiation as opposed to whether additional forms are required for the package. For example, it is not the responsibility of the reviewer to ensure that all forms are included in the application; rather, the reviewer ensures that all forms included in the application are complete.

It is important that reviews be completed in a timely manner, typically before the next RSC meeting. Generally, a PU is waiting for approval of a project in order to begin research. If reviews are not completed on time, it will cause an unacceptable delay in the issuance of a radiation use approval and in the research project. Such delays are detrimental to research projects, as all RSC members are aware. A more subtle consequence of delays is that a project that is delayed is a disincentive to faculty compliance and leads to circumvention caused by frustration.

Cover Page (Form RF-43B)

This form is to be completed by the reviewer. It documents the reviewer's comments, particularly any identified deficiencies. Answering the 9 items that are listed on the form identifies deficiencies. A thorough discussion of each of these nine items comprises the second part of this guidance document. Form-43B also documents that an informal visit to the laboratory and/or communication with the Principal User was completed. Finally, the RSC member provides a recommended action on the application. The application should be approved if no significant omissions or problems are encountered, and conditional approval should be indicated if several minor omissions or problems that can be readily remedied are noted. A project should be marked for disapproval if the application contains serious safety-related or technical flaws or a series of minor flaws that indicate, in the reviewer's estimation, general misconduct of radiation use. A fourth option, to have the entire RSC discuss the project at the next meeting, will generally always occur.

Results of the RCO Courtesy Review

The RCO performs a courtesy review of each radiation project application. Both the RSO and the Alternate RSO (ARSO) typically complete this review. The RCO writes a letter to the PU indicating any problems with the application, the PU revises the application, and the application is submitted to the RSC. Sometimes the PU will address each of the problems explicitly in a letter, and this letter is also included in the radiation project evaluation package. It is the duty of the RSC reviewer to verify that resolution to problems identified in the

courtesy review has been incorporated into the final application and to determine if courtesy review comments by the RCO are applicable.

Radiation Project Application

This is the bulk of the application. It contains the forms and descriptions required for approving radiation use at CSU. The version of the application received by the RSC reviewer will have been reviewed by the RCO and problems identified during the courtesy review should have been incorporated into the application.

REVIEWS OF RADIATION PROJECT APPLICATIONS

The suggested method for reviewing radiation project applications is to first read the entire package. Second, it is suggested that the reviewer interview the PU and tour the laboratory. The reviewer should then ensure that any problems identified during the courtesy review have been incorporated into the application. Finally, the reviewer should go through the nine items on Form RF-43B in accordance with the guidance given in this section. Any deficiencies or uncertainties identified during the review should be documented in the appropriate section of RF-43B.

Item #1: Did the PU state the purpose, objectives, and benefits of using the RAM?

This section is written by the PU and describes the purpose and objectives of using radioactive material (RAM). This section usually includes an optional description of the benefit of the work to the scientific community and CSU. This item should rely on the experience and knowledge of the reviewer for the specific project.

Item #2: Was the training and experience adequate for the personnel listed?

Check to see that the pertinent RF-2 forms are completed and signed. Check to see that all workers are correctly classified and that training for that classification is completed. The training table in the Radiation Control Manual outlines the training requirements for different categories of radiation workers.

Item #3: Were the location diagrams showing RAM use, storage areas, and wipe test locations adequate?

Check to see that the diagrams are accurate for the use and storage of RAM and that building and room numbers, facilities and equipment used are listed. Diagrams should include a master layout of all labs using RAM and diagrams showing locations where RAM is used and stored. Check to see that the number and approximate location of wipe tests is adequate (based on the reviewer's experience). Wipe test locations should include floors, doors, counter tops, use and storage areas, areas where RAM is not used (to determine a background baseline), and the frequency at which wipes are taken. If sealed sources are used (excluding exempt sources, i.e., low-activity sources used to test instrumentation), check to see that a leak test is scheduled every 6 months (every 3 months for alpha-emitting sealed sources).

Item #4: Was security addressed adequately?

Check the text to ensure that RAM is secured and accessible only to authorized users, that doors are to be locked when not attended (for more than 15 minutes), or that RAM is stored in

a locked refrigerator, a lock box, or a similarly controlled location. These security measures also apply to all radioactive or mixed waste.

Item #5: Did the RCO have any comments or concerns that you think need to be addressed before approval?

This item will be addressed during the RSC meeting following the review.

Item #6: Was the type of material, the procedures, precautions, safety, and waste disposal adequately addressed?

Check that the radionuclides and chemical forms are listed. Check that the procedures are included and list the amount used in experiments in clear, layman's terms. Based on the reviewer's knowledge of the procedures, check that the procedures are appropriate. Check that laboratory safety issues are discussed and appropriate, including the use of lab coats, gloves, and wearing closed-toe shoes, including a restriction on eating, drinking, and applying cosmetics in the laboratory. Check that both normal and worst case dose estimates are included; confirming the dose calculations is not necessary, but the reviewer should ensure that the normal dose estimates do not exceed occupational dose limits. Check that personnel monitoring is discussed and, based on the reviewer's experience, adequate. Check that waste disposal, including segregating mixed and biohazardous waste is described and that methods of minimizing waste are discussed. If the project includes short-lived radionuclides, check that their disposal is discussed and, based on the experience of the reviewer, adequate. Check that if sink disposal is used, that the radionuclide has less than a 16-day half-life and that the PU understands the maximum activity that can be disposed. Check that the type of waste containers is described and that elimination of biohazards is discussed and, based on the experience of the reviewer, adequate. Check that the frequency of wipe tests conforms to the following table:

Quantity of RAM Used at Any One Time	Wipe Test Requirements
< 1 ALI	Monthly Wipe Test
1 ALI - 30 ALI	Weekly Wipe Test
> 30 ALI	Daily Wipe Test

Item #7: Are the survey and counting instruments appropriate?

Check that appropriate instruments are used for the type of RAM being used. Check that at least two survey meters are described, that QA/QC checks are described and that serial numbers for the instruments are provided. If the RAM includes tritium, check that a liquid scintillation counter is mentioned. If tritium is the only radionuclide used in the laboratory, survey instruments are not required.

Item #8: Were postings addressed adequately?

Check that appropriate postings are either described or, in the case of the ALARA statement, included in the application. Check that the ALARA statement is adequate based on the experience of the reviewer.

Postings required for radiation laboratories at CSU include:

- Notification to Workers (posted at entrance to laboratory)
- ALARA statement (must be included as part of the application)
- Emergency Contacts and Warnings (posted at entrance to laboratory)
 - Work Area Postings
 - Storage Location Postings
 - Instrument Postings
 - Waste Area Postings

Item #9: Was the application complete?

Several forms exist for projects that involve specific types of radiation use situations, such as the use of analytical x-ray machines or machines used in the healing arts, require additional forms. If all of the information needed for Items 1 through 8 was provided and any additional forms included in the application are complete, then the application was complete. Otherwise, the application was incomplete and the omissions should be listed on form RF-43B.

Results of the final review by the Radiation Safety Committee are outlined in the RI-40 instructions.