



**EASTERN**  
MONTANA COLLEGE

1500 North 30th Street, Billings, MT 59101-0298

Department of Physical Sciences

406/657-2341

February 22, 1984

Dr. John T. Collins  
Regional Administrator  
Nuclear Regulatory Commission, Region IV  
Material Radiation Protection Section  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

Dear Dr. Collins:

We wish to renew license #25-12923-01, with some amendments. These include addition of a third user, an increase in the amount and form of  $^{14}\text{C}$ , and a new gamma counter. These changes are described in the attached sheet.

The enclosed documents, included with the last license renewal, represent current practices in use of radioisotopes at Eastern Montana College. We will continue to operate in accordance with the attached documents and applicable NRC regulations and license conditions. Thank you for your consideration.

Sincerely,

*Gary L. Bintz*

Gary L. Bintz  
Chairman, Department  
of Natural Sciences

GLB/pe

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REG4 LIC30  
25-12923-01 PDR

Requested Additions to Previous License Application  
(Form AEC-313)

- #4. Dr. Stanley M. Wiatr, Asst. Prof.
- #6 B. Carbon -14. Increase total amount to 15 millicuries  
Allow use of Ba<sup>14</sup>CO<sub>3</sub>, up to 5 millicuries.
- #8. Training and Experience for Dr. Stanley Wiatr (all training at U of Alberta, Edmonton)
- a. Principles and practices of radiation protection  
Trained for 6 months on the job and in formal courses.
  - b. Radioactivity measurement standardization and monitoring techniques and instrumentation.  
Trained for 4 months on the job and informal courses.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.  
Trained 4 months on the job and informal courses.
  - d. Biological effects of radiation.  
Trained 4 months on the job and informal courses

#9. Experience of Dr. Stanley Wiatr with Radiation.

|    | <u>Isotope</u>   | <u>Maximum Amount</u> | <u>Where</u> | <u>Duration</u> | <u>Type of Use</u>                             |
|----|------------------|-----------------------|--------------|-----------------|--|
| a) | <sup>14</sup> C  | 3 millicuries         | U of Alberta | 1 year          | <sup>14</sup> CO <sub>2</sub> uptake in plants |
| b) | <sup>131</sup> I | 2 µCi                 | "            | 6 months        | Training in Radiation safety                   |
| c) | <sup>32</sup> P  | 2 µCi                 | "            | "               | for technicians and isotope                    |
| d) | <sup>3</sup> H   | 2 µCi                 | "            | "               | tracer methodology                             |
| e) | <sup>99</sup> Tc | 2 µCi                 | "            | "               | "  |

- #10. Searle 1185 gamma counter, sensitivity 0-1 million dpm, used for measuring.
- #12. Countertops are monitored at 6 month intervals.

SUPPLEMENT SHEET NUMBER 1

9. Experience with Radiation

|       |                 |  |          |                   |
|-------|-----------------|--|----------|-------------------|
| Na-22 | 100 microcuries | Cornell Univ./Univ. of New Mexico            | 10 weeks | studies in        |
| H-3   | 1.0 millicurie  | Cornell, New Mexico, Eastern Montana College | 6 months | laboratory animal |
| C-14  | 1.0 millicurie  | Cornell, New Mexico, Eastern Montana College | 5 years  | " "               |

→ " Source 1185 /

13. Facilities and Equipment.

- The radioisotope laboratory is located well away from most traffic in the Science Building and is subject to very little use other than that for radioisotopes. The lab is 12 x 28 feet and includes a sink, 36 feet of counter and storage space, a refrigerator, and a safe for storing radioisotopes. Nearly all isotope work is conducted in this laboratory.
- A second room is available for work with volatile materials, including isotopes in volatile forms. This room is 6 x 8 feet and contains counterspace, a sink, and a fume hood. The room is reserved for work of this type.
- Field work with Carbon-14 and Hydrogen-3 is also anticipated. The work consists of administration of Carbon-14 or Hydrogen 3 (5-10 microcuries/animal) to wild Richardson's ground squirrels, Spermophilus richardsoni. The ground squirrels will be marked with food coloring for identification and released. Ground squirrels will be recovered the next day and the fate of the injected label will be determined. Not all ground squirrels can be recovered, but in one trial during which label was not injected we recovered 14 of 19 ground squirrels which had been trapped and released.

A study site has been located which offers a high density of ground squirrels. This site is prairie and is approximately one mile from permanent water and four miles from permanent human habitation. The site is private land.

Field studies will involve less than one millicurie annually.

14. Radiation Protection Program.

- The principal users order radioisotopes and one of these individuals is contacted by the airline delivering the isotope if arrival occurs during off-duty hours. Radioisotopes are stored in a locked safe in the basement of the building in a room with a special lock. All radioisotopes are received by the principal users in the radioisotope lab.
- Initial examination is done with a G-M scalar. The package is then opened over a metal tray, and the content are inspected for leaks. Packing materials are surveyed and disposed of only after it has been confirmed that no leaks have occurred. The date, amount, and form of incoming isotopes are logged.
- Currently no students handle radioisotopes unless directly supervised by one of the principal users. Secondary users are trained on the job.
- See attached, in addition to:
  - There are no sealed sources greater than 410,000 dpm.

SUPPLEMENTAL SHEET NUMBER 3

14. Continued

- e) Not applicable, since quantities are small and the principal users will be present during all experiments.
- f) The animal room is separated from the radioisotope lab. When animals are used in isotopic experiments, they are housed in the radioisotope lab and cared for by the investigator(s). This room is locked except during its use by the principal investigators. Contaminated cages are washed in a sink in the radioisotope lab under the direct supervision of the principal investigators. Carcasses are buried in accordance with Section 20.106 of 10 CFR Part 20.
- g) The radioisotope lab is surveyed each week during periods of moderate use, and more often with heavy use.

15. Wastes will be disposed into the plumbing system of the Science Building. Isotopes of short half life (eg: P-32) will be stored until activity is low before being disposed. Wastes will be disposed in the radioisotope laboratory, except for that amount lost by failure to recover all animals injected during field studies.

Acknowledgement Form 270-130

Receipt and Review of Form 10 CRF, Section 19.12

I have reviewed form 10 CRF, Section 19.12 and have had opportunity to raise questions with Gary L. Bintz.

Signed \_\_\_\_\_

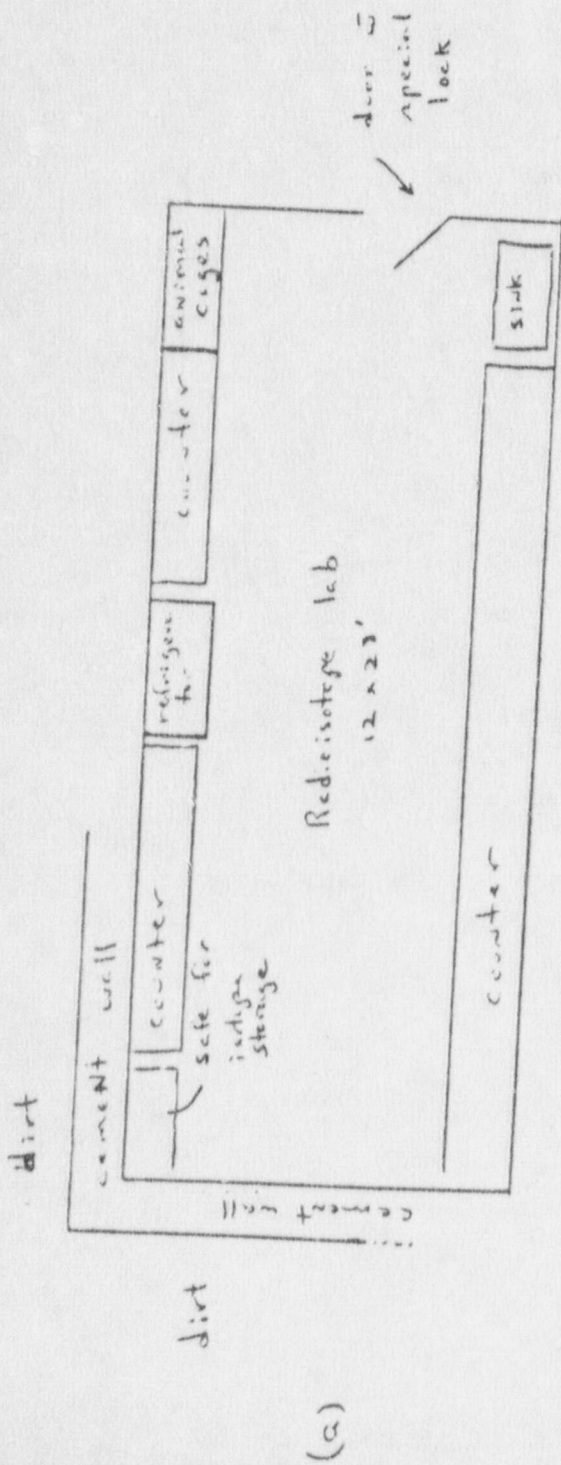
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### Emergency Procedures

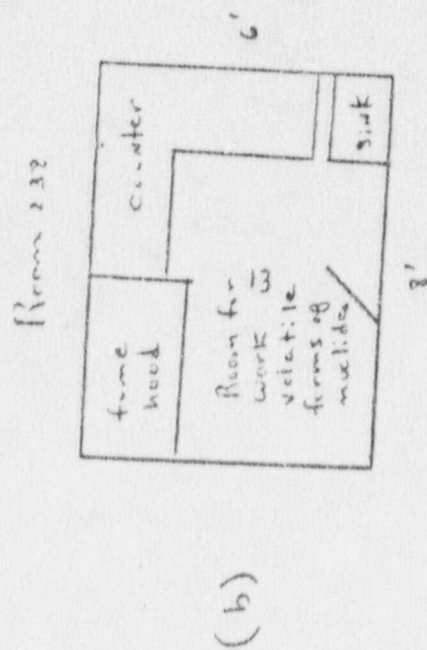
1. Cordon off area of suspected contamination.
2. Try to determine type of contamination (type of nuclide).
3. Put on protective clothing (foot- and handwear).
4. Determine area of contamination by monitoring.
5. Decontaminate area, beginning from outer edge. Monitor to assure decontamination.
6. Notify Gary L. Bintz, Jay F. Kirkpatrick, or Stanley M. Wiatr (657-2031).
7. Notify Security Office (657-2298).

### Instructions for Animal Caretakers

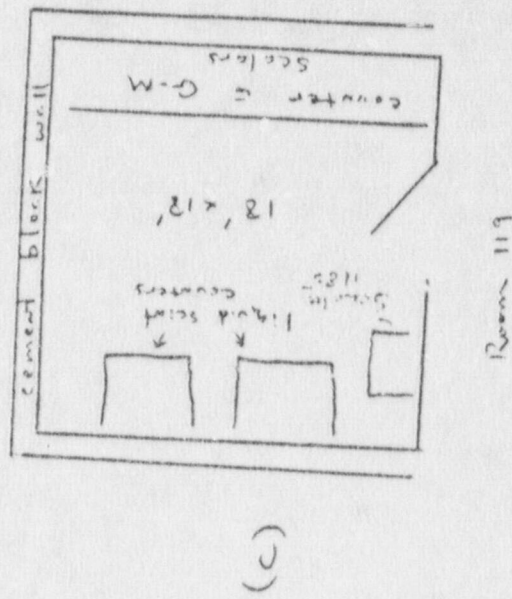
1. Animals containing radioactivity are to be marked by individual users. Such animals must not be handled by caretakers.
2. Disposable gloves will be worn when working with or near animals containing radioactive materials.
3. Items use in care of animals (brooms, mops, brushes, bottles, etc.) must not be used in another room.
4. Animal wastes and carcasses containing radioactivity are to be stored in the freezer in Sc 119 until disposal is arranged.
5. Cages from animals containing radioisotopes are to be washed only in the appropriate tank.
6. No food, drink, or smoking is allowed in the Animal Room when radioisotopes are employed.
7. Direct questions to Jay F. Kirkpatrick or Gary L. Bintz.



### Rooms for Radioisotope Use



- a) away from traffic and locked
- b) & c) near traffic, but locked



Procedures for Ensuring that Animal Rooms will be Locked.

1. Animal rooms are on security lock and are locked at all times.
2. Cages housing contaminated animals are latched and wired shut.
3. Only authorized users and caretakers have keys to the animal room.