

45-25405-01

NRC FORM 112 (5-89) 1008R 20, 21, 22 14 28 29 30 31

U.S. NUCLEAR REGULATORY COMMISSION APPROVED BY DMS 0188-0100 10/10/97

APPLICATION FOR MATERIAL LICENSE

130-34516

INSTRUCTIONS SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY, 4005 WASHINGTON, DC 20545

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I NUCLEAR REGULATORY SAFETY SECTION 9 475 ALFORD DRIVE KING OF PRUSSIA, PA 19380

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, OKLAHOMA, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II NUCLEAR REGULATORY SAFETY SECTION 191 MARKET STREET SUITE 200 ATLANTA, GA 30333

IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION III MATERIALS LICENSING SECTION 100 ROOSEVELT ROAD GLEN ELLEN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V MATERIAL RADIATION PROTECTION SECTION 611 RYAN PLACE DRIVE, SUITE 1000 ARLINGTON, TX 76010

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV NUCLEAR MATERIALS SAFETY SECTION 100 MARK LANE, SUITE 210 WALNUT CREEK, CA 94596

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

1. THIS IS AN APPLICATION FOR: A. NEW LICENSE B. AMENDMENT TO LICENSE NUMBER C. RENEWAL OF LICENSE NUMBER

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code) Virginia Equine Imaging P.O. Box 835 Middleburg, Virginia 20118

3. ADDRESS (Where licensed material will be used or possessed) 2716 Landmark School RD The Plains, VA 20198

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION Allen C. Jones TELEPHONE NUMBER (703) 787-7900

IMPORTANT: ITEMS 5 THROUGH 11 ON ENCL. 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. isotopic composition. 6. PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED. 7. INDIVIDUALS 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 FEE: Fee 10 CFR 170.20 and Section 170.211. FEE CATEGORY: 3P AMOUNT ENCLOSED: \$550.00

13. CERTIFICATION: I, the undersigned, being duly sworn, certify that all statements and representations made in this application are true and correct to the best of my knowledge and belief. I, the undersigned, being duly sworn, certify that all statements and representations made in this application are true and correct to the best of my knowledge and belief. I, the undersigned, being duly sworn, certify that all statements and representations made in this application are true and correct to the best of my knowledge and belief. I, the undersigned, being duly sworn, certify that all statements and representations made in this application are true and correct to the best of my knowledge and belief.

SIGNATURE: [Signature] A. Kent Allen OVM TITLE: President DATE: 7/10/97

FOR NRC USE ONLY. TABLE with columns: TYPE OF FEE, FEE LOG, FEE CATEGORY, COMMENTS.

APPROVED BY: [Signature] DATE: [Blank]

NRC FORM 112 (5-89)

ESTIMATED BURDEN OF THIS INFORMATION TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST IS 15 MINUTES PER RESPONSE. FORWARD COMMENTS REGARDING BURDEN ESTIMATES TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (1030), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE OFFICE OF INFORMATION AND REGULATORY AFFAIRS, BRANCH OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

Control # 257560

ITEM 5-RADIOACTIVE MATERIAL

page 2 of 26 pages

Byproduct, source and/or special nuclear material	Chemical and/or physical form	Maximum amount that licensee may possess at any one time under this license
A. Technetium-99m	A. Any unit dose form listed in Groups I and II of Schedule A, Section 35.100 of 10 CFR Part 35(superseded) or Sections 35.100 and 35.200 of 10 CFR Part 35(effective April 1, 1987)	A. 1.5 curies

Item 5
Date 6/14/97

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257560

ITEM 6 NRC-313

ITEM 6-Purpose(s) for which licensed material will be used

- A Byproduct material under (A) will be used for diagnostic veterinary medicine procedures on animals.

Item 6
Date: 6/14/97

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257560

Virginia Equine Imaging requests authorized user status for Dr. A. Kent-Allen, listed under condition 11 license No. AZ 7-389 Amendment No. 12 as Radiation Safety Officer (RSO). Authorized user status is also requested for Dorothy Hammon, listed under license No. AZ 7-389.

1. In support of this request, V.E.I. confirms that the RSO or an authorized user designated by the RSO will be available whenever licensed material is being used.
2. The designated RSO will be Dr. A. Kent-Allen
3. The day-to-day Radiation Safety Officer will be present on a daily basis in order to implement and direct the radiation safety program. During his absence, another qualified "authorized user" will perform his duties to assure regulatory compliance. The RSO will be allowed to delegate safety program duties to trained employees at the authorized place of use.
4. Training of above individuals see pages 5-7.

Item
Date 6/14/97

Control #
257560

Virginia Equine Imaging requests authorized user status for Dr. A. Kent-Allen, listed under condition 11 License No. AZ 7-389 Amendment No. 12 as Radiation Safety Officer (RSO). Authorized user status is also requested for Dorothy Hammon, listed under license No. AZ 7-389.

2. In support of this request, confirms that Dr. A. Kent-Allen, ~~Dorothy Hammon or at least one individual that fulfills the requirements of this license~~ shall be readily available whenever licensed material is being used. *of*
3. The designated RSO will be Dr. A. Kent-Allen
The day-to-day Radiation Safety Officer will be present on a daily basis in order to implement and direct the radiation safety program. During his absence, another qualified 'authorized user' will perform his duties to assure regulatory compliance. The RSO will be allowed to delegate safety program duties to trained employees at the authorized place of use.
4. Training of above individuals see Appendix I.

Item 7

Date: 6/14/97

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JUL-10-97 04:01 PM VA EQ IMAGING KENT ALLEN 5486874665

JOHN W HASTY
DIRECTOR

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF HEALTH PROFESSIONS

600 WEST BROADWAY STREET
4TH FLOOR
RICHMOND, VA 23260-1717

BOARD OF VETERINARY MEDICINE

EXPIRES
02-28-98

**LICENSE TO PRACTICE
VETERINARY MEDICINE**

NUMBER
0301007035

A. K ALLEN, DVM

**TO PROVIDE INFORMATION OR FILE A
COMPLAINT ABOUT A LICENSEE, CALL: 1-800-533-1560**

- DEPARTMENT OF HEALTH PROFESSIONS**
- Audiology And Speech Language Pathology Board of
 - University Board of
 - Uniformed Services University of the Health Sciences Board of
 - Medical Board of
 - Nursing Board of
 - Nursing Home Administrators Board of
 - Optometry Board of
 - Pharmacy Board of
 - Professional Counselors Board of
 - Psychology Board of
 - Social Work Board of
 - Veterinary Medicine Board of
 - Podiatry Board of
 - Public Health Board of
 - Public Health Administration Board of
 - Public Health Inspection Board of
 - Public Health Laboratory Board of
 - Public Health Statistics Board of
 - Public Health Training Board of
 - Public Health Administration Board of
 - Public Health Inspection Board of
 - Public Health Laboratory Board of
 - Public Health Statistics Board of
 - Public Health Training Board of

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF HEALTH PROFESSIONS

NAME AND ADDRESS CHANGE ONLY

BOARD OF VETERINARY MEDICINE
LICENSE TO PRACTICE
VETERINARY MEDICINE

NUMBER **0301007035** EXPIRES **02-28-98**

0301007035

A. K ALLEN, DVM
P.O. BOX 1068
MIDDLEBURG, VA 20113

Item 11
Date: 6/14/97

Control #
257560

VIRGINIA EQUINE IMAGING

A. KENT ALLEN, DVM

PO BOX 835

MIDDLEBURG, VA. 20118

540-687-4663 OFFICE

540-687-4665 FAX

May 16, 1997

The following is a brief synopsis of the applicant's history and experience in nuclear medicine.

Dr. Kent Allen is a 1979 graduate of the University of Missouri-Columbia College of Veterinary Medicine. Like all graduates of this college he received training in radiation safety and nuclear medicine (approximately 80 hours).

Dr. Allen continued to stay current with the literature in this field as he moved into private practice. After deciding to offer nuclear medicine in his equine practice he turned to the University of Illinois for specialized training in nuclear medicine.

The University of Illinois Champaign-Urbana College of Veterinary Medicine has been at the forefront of veterinary nuclear medicine for more than 16 years, with particular expertise in equine nuclear medicine. They have excelled, both technically and clinically, in nuclear medicine and have established procedures to perform nuclear medicine in a safe and organized fashion. Dr. Allen mimicked these procedures in establishing his nuclear medicine department in Arizona.

The training that Dr. Allen received at the University of Illinois included all aspects of day to day nuclear medicine. Practical aspects of nuclear physics were covered and handouts were given for home study.

Drs. Twardock, Chambers, and Mulebauer all assisted Dr. Allen in the techniques of the nuclear scan, the preparation of images, and the production and interpretation of images.

Janet Fransisco, the department's nuclear medicine technician, taught Dr. Allen the proper handling and safety procedures involved in the University's "hot lab". This included handling of the isotope, milking the generator, dose calibration, and the care and preparation of the patient before and after administration of the isotope. Dr. Allen was

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Instructed in the monitoring of the patient prior to release and the prevention of cross contamination within the clinic.

Dr. Allen spent many hours during his multiple visits to Illinois learning to properly interpret nuclear scans. His combined study at Illinois and home study is over 200 hours of time.

Dr. Allen continues to stay in close touch with the nuclear medicine staff and has returned each year since 1991 as a guest speaker at the University's nuclear medicine training workshops to lecture on developing nuclear medicine in the private practice.

In 1991 Dr. Allen was granted a radioactive materials license in the state of Arizona and operated a nuclear medicine department offering nuclear scintigraphy for equines. His was the first, and still the only practice, to offer nuclear medicine in Arizona and was the second private practice in the country to offer nuclear medicine. In the course of the 5 and 1/2 years Dr. Allen was the RSO on the Arizona license the center performed over 500 nuclear bone scans and a small number of lung perfusion studies. The center also offered thyroid and bone imaging to dogs and cats.

Dr. Allen has always stressed safety in the operation of his nuclear medicine department and toward that end he arranged to send his head technician Dorothy Hammon to Illinois to attend the Nuclear Medicine Workshop. She was the first technician to receive this training. She then traveled to Illinois a second time and spent an additional week of intensive training with the University staff. With the exceptional training of his staff Dr. Allen has always maintained a high level of safety and awareness of procedures in his employees.

In addition to operating a veterinary nuclear medicine department Dr. Allen is frequently invited to speak about nuclear medicine at a number of professional meetings across the country, including the American Veterinary Medicine Associations's annual meeting and the Virginia Veterinary Medical Association annual meeting and many others.

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SURVEY METERS:

A low-level survey meter will be provided for contamination surveys.

<u>QTY:</u>	<u>MANUFACTURER</u>	<u>MODEL#</u>	<u>PROBE TYPE</u>	<u>RANGE</u>
1	LUDLUM	14 C	PANCAKE G-M	0- 2000 mR/hr

Survey meter is outfitted with a Cs-137 check source to ensure operational standing of this meter before conducting contamination or radiation surveys.

DOSE CALIBRATOR:

not applicable since only unit doses will be obtained from a nuclear pharmacy

ANCILLARY EQUIPMENT:

Syringe shield, Lead vials and pigs, radiation warning signs, long handled forceps, and absorbent material will be used when practical to minimize radiation exposure to personnel.

**Item 8
Date 6/14/97**

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ITEM -CALIBRATION OF INSTRUMENTS

page 9 of 26 pages

- 1. Survey meters are calibrated annually by the manufacturer and or Mid America Calibrations 5500 Buena Vista Suite 101 Shawnee Mission Kansas 66205 license number 33-C749-01.**

**Item 9
Date 6/14/97**

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ITEM -PERSONNEL MONITORING

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The RSO will promptly review all exposure reports to look for workers whose exposure is unexpectedly high. All individuals who are occupationally exposed to radiation on a monthly basis will be issued Total body film badges. Those individuals who handle millicurie amounts of radioactivity to animals will also use a TLD ring with a Total body film badge. The organization furnishing the personnel monitoring devices will be Proxtronic's of Burke Va. which is NVLAP accredited. The exchange frequency for these rings and badges will be monthly.

Item 10
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ITEM -BIOASSAY PROCEDURE

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Not Applicable

Item 11
Date 6/14/97

SITE DESCRIPTION

V.E.I. has acquired 4,000 sq. ft. of space located at 2716 Landmark School Rd. The facility is located in Fauquier County, Virginia in a free standing, two story building at least 50 feet away from the next closest building. A room will be outfitted for off-hours delivery of radioactive material. (see enclosed sketch on page 13). The structure is a two story free standing building constructed of concrete and steel. This building is located in a commercially zoned area for use as a imaging facility.

The heating system is gas forced air. The cooling system consists of two air conditioning units. The adjoining x-ray room of the building a lockable office, entitled RA1 on the enclosed sketch, will be used for receipt of shipments when the office is closed.

Legend for Diagram on page 13

UNRESTRICTED AREA

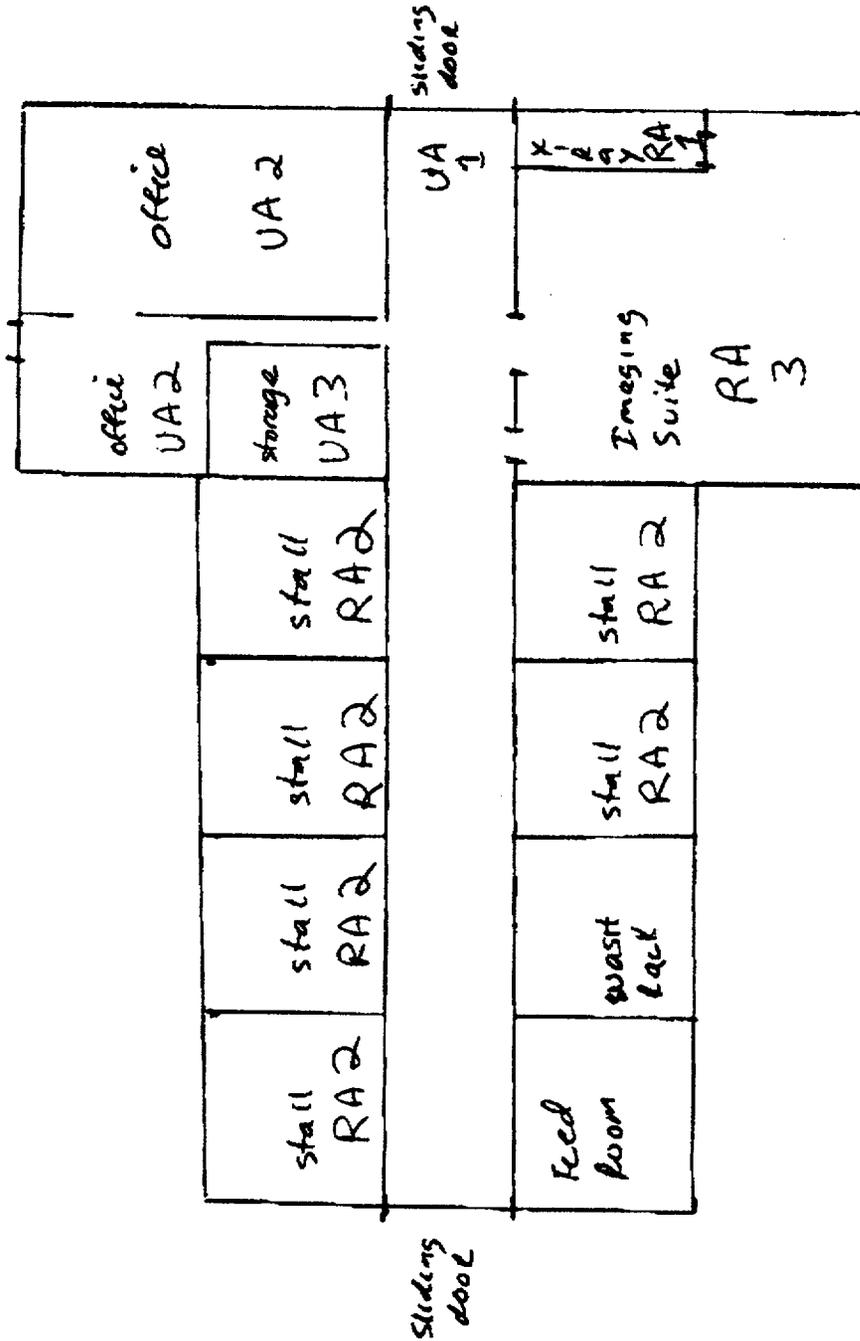
1. Entrance VA1
2. Office area VA2
3. Storage room VA3

RESTRICTED AREA

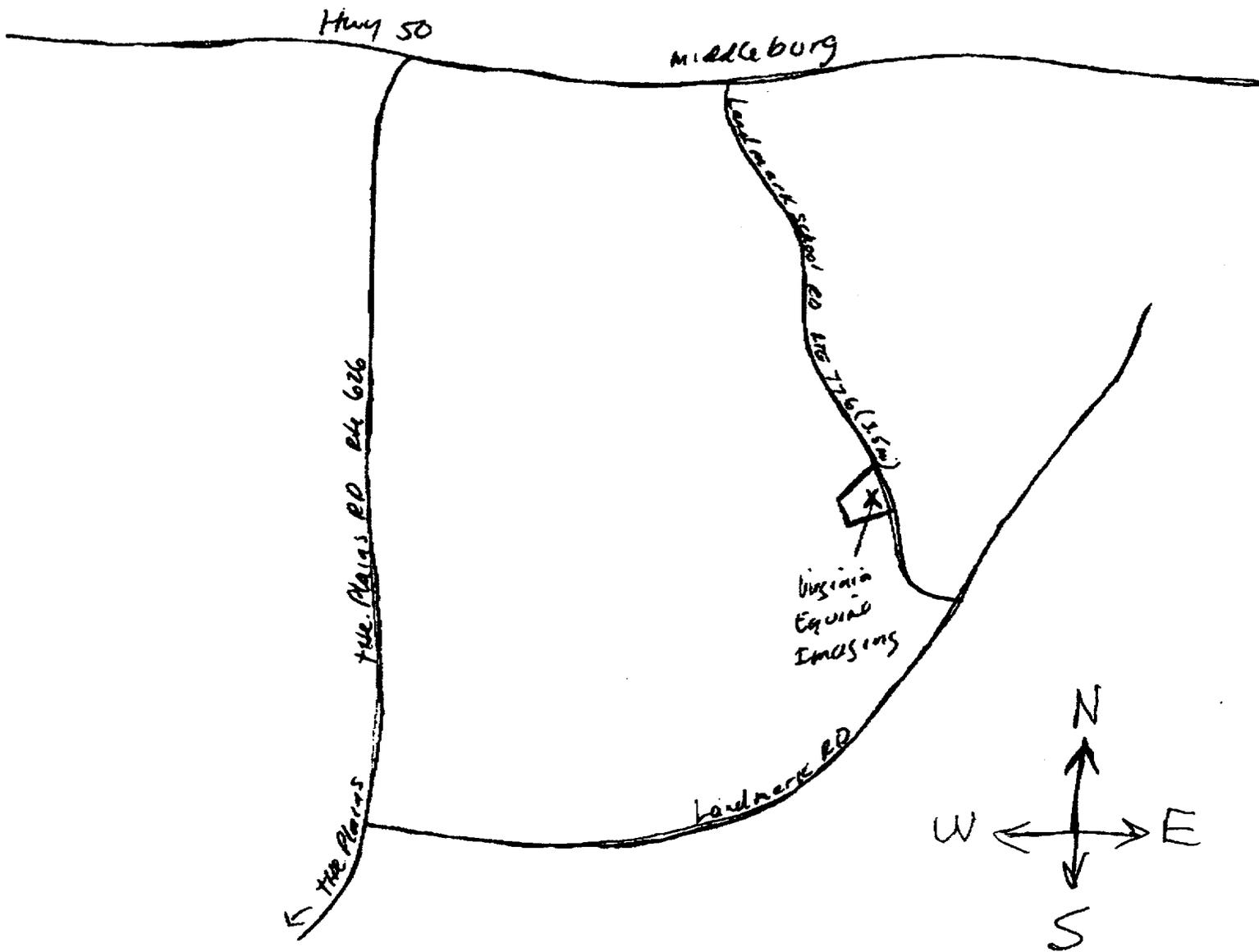
1. X-ray processing room RA1
2. Stalls RA2
3. Imaging Suite RA3

Please see attached area diagram on page 14.

See attached letter on page 15 which will be sent to the fire department.



Item # 2
Date: 6/14/97



Item #2
Date: 6/14/97

15 pages of 26 pages.

DATE

ADDRESS

ATTENTION: (Chief of Police Department)
(Chief of Fire Department)

To whom it may concern:

We are required by the Nuclear Regulatory Commission and/or the state of Virginia to notify you that we are utilizing radioactive materials under an NRC or Virginia license at:

Address:

2716 Landmark School Rd.
The Plains, VA 20198

This notification is for your information in case of a fire or disaster which might involve this facility.

The material with which we work is for use by veterinarians for animal purposes and, therefore, is comprised of short-lived radiopharmaceuticals.

Very little danger would exist in case of a fire or disaster. However, precaution should be exercised by fire fighting personnel should it be necessary to enter the room in which the radioactive is stored. In the case of a fire, the non-volatile material would remain confined to this room due to the storage containers of the materials.

If it were necessary and possible to enter the restricted area, survey instruments are readily available and located in rooms adjacent to the radioactive storage room. Also, personnel trained in the use of survey instruments and familiar with hazardous radiation levels would be available to assist your personnel.

If you have any questions concerning this notification, or if you would like to visit our facility to familiarize yourself with our location, do not hesitate to contact us.

Sincerely,

_____, VA _____

Radiation Safety Officer

Note: The above letter is mailed to the Police Chief and Fire Chief with the appropriate information filled in specifically for location.

Item # 2
Date: 6/14/97

ITEM -WASTE MANAGEMENT

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V.E.I. will dispose of radioactive waste by decay in storage in accordance with the requirements in Section 20.2 of 10 CFR Part 20. V.E.I. has established written procedures covering this disposal method and these procedures are as follows.

1. All radioactive waste related to the animal in the stall will be isolated in the stall until 10 half-lives have elapsed **and** using the low level survey meter the contaminated material has been determined to have dropped to background levels.
2. The records of the results of the measurements of 1 will be maintained for NRC inspection for two years.
3. All radiation labels be removed and obliterated before disposal as normal trash.

Item 13
Date 6/14/97

ITEM 14 -ALARA/ RADIATION SAFETY PROGRAM page 17 of 26pages

Occupational exposure of individuals at this location will be kept individually below as follows:

1. Whole body: head and trunk; active blood-forming organs; lens of eyes; or gonads. 125mrem/calendar quarter
2. Hands and forearms; feet and ankles 1875mrem/calendar quarter

Radiation level in unrestricted areas outside this facility will be kept at essentially background level. Radiation in unrestricted areas adjacent to radiation areas will be kept at the lowest practicable level. The Alara program will be reviewed annually to comply with 10 CFR 20.1101.

GENERAL PROCEDURES FOR THE SAFE USE OF RADIOACTIVE MATERIAL

1. Use of radioactive material will be under the supervision of an authorized user.
2. Water-proof gloves will be worn while handling radioactive material.
3. A Film Badge and ring badge will be worn by individuals handling radioactive material.
4. No eating, drinking or smoking will take place in the restricted area.
5. Surveys of hands and feet will be performed each time and individual leaves the restricted area.
6. Area surveys will be performed after the use of radioactive material to ensure no spills are present.
7. Waste from patients will be stored in restricted area for 10 half-lives **and** until background exposure levels are achieved.
8. Area surveys will be performed at the end of each day radioactive material is handled. This includes the handling of animal waste. Action levels will be 5mR/hr for restricted area and 0.6mR/hr for non restricted area. The unrestricted areas will be monitored monthly to ensure they are below 0.6mR/hr.

Item 14
Date 6/14/97

ITEM 16 -SEALED SOURCE/ & LEAK TEST PROCEDURES

No sources requiring leak testing will be obtained.

The Animal housing facility is located in a separate building. There will be six stalls for horses. A nuclear medicine department and a storage room and office room. This building has a lockable door. The animal facility is located on the ground floor. Each stall is approximately 144 square feet. The floor is concrete with a rubber mat covering, with saw dust on top of the rubber mat. The animals that are going to have nuclear bone studies will be kept in the stables. In each stall, there is a closeable drain connected to the septic tank thus if necessary each stall is washable. The Imaging suite is approximately 250 square feet with a closeable floor drain and has a lockable door. If an animal voids in the imaging suite every effort will be made to collect the urine in a plastic container properly labeled "Radioactive Material" and that bucket will be placed in the animal's stall for decay. After the study, an area survey will be performed. After the study the animal will be kept in its stall.

INSTRUCTIONS TO ANIMAL CARETAKER

1. Wear protective clothing at all times when inside the stall area.
2. Follow good hygiene after handling the animals, such as washing your hands.
3. Do not eat, drink, smoke, or apply cosmetics in the restricted area.
4. Wear personnel monitoring devices at all times in the restricted areas and when working on animals.
5. Animals containing radioactive material are to be confined to one of the stalls.
6. All stalls will be surveyed after releasing the horse. The reading is to be less than twice background. If not, they will be held until they decay to background.
7. Any questions contact the R.S.O. Dr. Kent Allen.

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ITEM 18-ORDERING AND RECEIPT PROCEDURES FOR RADIOACTIVE MATERIAL

The individuals ordering unit doses will include Dr. Kent Allen as R.S.O. or Dorothy Hammon. Dr. Kent Allen can also delegate the duty of ordering to an adequately trained employee but he still retains the responsibility for maintaining V.E.I.'s acquisitions of radioactive material within V.E.I.'s possession limits.

RECEIPT PROCEDURES

1. A secure area will be provided for delivery of radioactive material shipments.
2. Water proof gloves will be worn.
3. Package will be checked for damage or wetness. If found the R.S.O. will be immediately notified.
4. Surface reading will be checked to ensure it is under 200mR/hr.
5. A wipe test will be performed on the outside of the package and on the dose container inside the package to ensure removable contamination is below 2000 dpms/100cm squared. If readings are found above the preceding the R.S.O. will be notified.

Item 18
Date 6/14/97

ITEM 19-OPENING PROCEDURES

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1. Nuclear pharmacies will be notified as to exact after hours delivery location which is identified as the X-Ray room.
2. Nuclear pharmacies will be allowed to leave deliveries during working hours in the Imaging room.
3. In case of a damaged package the R.S.O. will be contacted Dr. Kent Allen at 540-687-4663
4. When opening packages gloves will be worn at all times
5. Each package should be visually inspected for damage. And R.S.O. notified if package is damaged.
6. Packing slip should be verified with prescription on dose.
7. Package exposure rate at the surface and at one meter should be measured and if higher than expected R.S.O. should be notified.
8. Check integrity of final dose container.
9. Wipe external surface of package and survey wipe in low background area. Take appropriate steps if contaminated.
10. Survey packing material and packages in low background area for contamination before discarding.
 - a. If contaminated treat as radioactive waste.
 - b. If not contaminated follow package return procedures of nuclear pharmacy.
11. Records of surveys shall be maintained in accordance with 10 CFR 30.51

Item 19
Date 6/14/97

ITEM 20-ANIMAL HANDLING PROCEDURES

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1. All doses shall be obtained in a unit dose form assayed from a nuclear pharmacy
2. The dosage range shall be 100-200mCi per bone dose.
3. Lab coats and gloves shall be worn by all personnel handling radioactive doses.
4. Syringe shields shall be used when injecting doses if at all possible.
5. If an animal defecates or urinates in the imaging suite after being injected all means will be employed to catch this so it doesn't contaminate the suite floor.
6. The animal after imaging shall be immediately returned to their stall. And the stall shall be identified with radioactive material.
7. After 18 hours the animal will be removed from their stall and personnel will survey the room with G.M. survey meter for contamination. If contamination is found the animal caretaker will lock the room for another 24 hours and resurvey the stall until it is twice background and can be released for cleaning.
8. An animal will not be released to its owner until the surface reading of the animal is less than 6.0 mR/hr. If animal is greater than 6.0 mR/hr animal will be held until next day resurveyed and released if under 6.0mR/hr.

Item 20
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EMERGENCY PROCEDURE FOR RADIOACTIVE SPILLS

1. Notify person in the immediate area that a spill has occurred.
2. Cover the spill with absorbent paper to contain and prevent spread.
3. Limit access to the area to those persons dealing with the spill.
4. Survey persons involved before releasing them from the area. Remove The footwear and cover the floor if necessary to avoid tracking contamination. Have shoe covers available to prevent furthering the contamination.
5. Remove contaminated clothing and repeat survey to determine if skin contamination exists. Decontaminate skin surface with mild soap and cool running water. Do not use abrasive action.
6. Wash contaminated lab surface taking care not to spread spill or crosscontaminate. Survey area repeatedly to assess decontamination. If non removable contamination exists, restrict area and label appropriately.
7. Notify **RADIATION SAFETY OFFICER AND AREA SUPERVISOR** for further instruction.
8. Report all radioactive spills on daily area survey form with actions taken.

RADIATION SAFETY OFFICER DR. KENT ALLEN DVM

AREA SUPERVISOR DOROTHY HAMMON

ITEM 22-GENERAL LABORATORY SAFETY

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1. Only Dr. Kent Allen, Dorothy Hammon, or an employee whose name is on the authorized order's list may place orders.
2. All procedures will be performed under the general supervision of Dr. Kent Allen.
3. Laboratory coats will be worn at all times where radioactive material is used.
4. Syringe shields will be used when at all possible to reduce exposure from doses being administered.
5. Do **Not** eat, drink, smoke or apply cosmetics in any restricted area.
6. Wear personnel monitoring devices at all times while in restricted areas.
7. Wear finger exposure monitor when administering doses to animals.
8. Wipe test **weekly** for contamination Imaging area, X-Ray, Hall way, and Animal stalls used.
9. Survey same areas as item 8 **daily** for contamination using survey meter when imaging has taken place.
10. Log book will contain nuclear pharmacy's prescription label as record.

Item 22
Date 6/14/97

ITEM 23-AREA SURVEY PROCEDURES

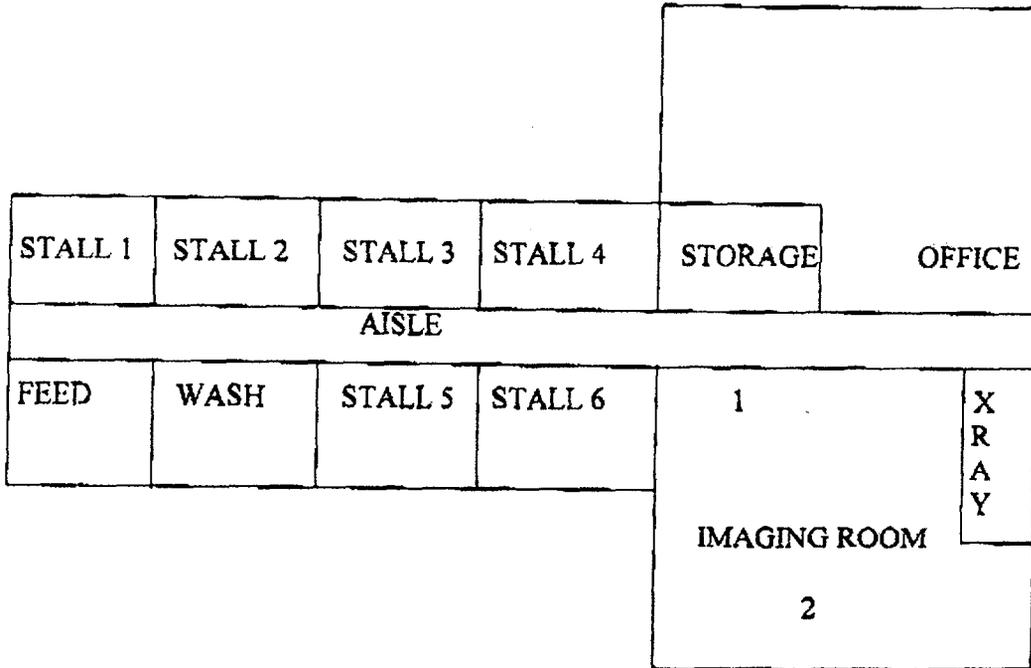
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Radiopharmaceutical storage, administration, imaging areas will be surveyed at the end of each day when imaging has taken place with a Ludlum 14-C in mR/hr and decontaminated if necessary. An example a survey form is enclosed on page 26. While meter is being calibrated a loaner meter will be available.

Wipe testing will be performed weekly in dpm's. The action level will be 220 dpms over background.

The results of these surveys will be recorded and reviewed by the RSO and retained for NRC inspection.

Item 23
Date 6/14/97



AREA SURVEY READINGS

(Stalls occupied by nuclear cases are indicated by asterisks)

DATE OF SURVEY _____

READINGS:

BARN:

STALL _____

STALL _____

STALL _____

AISLE _____

IMAGING ROOM :

AREA 1 _____

AREA 2 _____

XRAY _____

ARIZONA EQUINE

ITEM 7 AND 8:

Radioactive
Material

Chemical and/or
physical form

Maximum quantity licensee
may possess at anyone time

(1) Tc99m

Sodium Pertechnnetate liquid

2000mCi

For Tc99m labeled bone agents as a unit dose to perform diagnostic study on horses, dogs or cats.

ARIZONA EQUINE

ITEM. 9

We will not have Radiation Safety Committee. I will ensure that all individuals who work with or in the vicinity of radioactive material or source of radiation have sufficient training and experience to enable them to perform their duties safely and in accordance with the law, rules and the conditions of the license.

ARIZONA EQUINE

ITEM: 10

DUTIES OF THE RADIATION SAFETY OFFICER

1. Be familiar with all applicable laws, rules and license application guides, and ensure that license applications are properly filled out and submitted in a timely fashion. Ensure that the institutional radiation use and safety programs comply with license application and conditions.
2. Establish and maintain record system of all radiation area surveys, wipe tests, leak tests, calibration of instruments, and personnel dosimetry reports. Perform a review each calendar quarter of records of surveys to determine that they are at "AS LOW AS REASONABLY ACHIEVABLE" (ALARA) levels for the period.
3. Review personnel dosimetry reports monthly and advise individual radiation workers of any high film badge report. RSO should determine the cause of all overexposure so as to preclude recurrence. At the conclusion of each calendar quarter, perform a quarterly review of occupational exposure to users and workers to determine that the exposures are within the limits established for the ALARA program.
4. Ensure that individuals working with radiation have appropriate protective devices, including shielding, ventilation, clothing, gloves, remote handling equipment, instrumentation, and facilities which aid in keeping exposure ALARA.
5. Act as a liaison agent with regulatory authorities to include being available for assistance in inspections and audits, and notifying the Agency:

ITEM. 10

ARIZONA EQUINE

- A. In writing before making any change which would render the Application for Radioactive Materials License, Application for Registration of Radiation Producing Machine, or Notice of Registration no longer accurate.
- B. Immediately in the event of any incident of high film badge exposure reading.
- C. Within five (5) days of any positive leak test result of a sealed source.
- D. Within 30 days in a report stating remedial action taken after an accident or incident.
- E. Using ARRA Form 16, report all misadministrations in accordance with requirements listed in AAC R12-1-310.E.
- 6. Perform, or cause to be performed, during each calendar quarter, an inventory of all sealed sources received or possessed. Ensure all survey, calibrations, and leak tests are performed within 10 days.
- 7. Post proper posting includes the Notice to Articles 4 and 10 and related documentation.(Article 10 of Title 12.)
- 8. Supply employers of terminated occupationally exposed personnel with radiation exposure records when requested.
- 9. Establish and cause to be maintained inventory control of radioisotopes at the institution. Ensure that the inventory never exceeds amounts licensed. Keep, or cause to be kept, records of receipts of incoming isotopes. Ensure that all

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incoming and outgoing radioactive material shipments are properly packaged and labeled according to DOT requirements. Ensure that radioactive materials are disposed of properly and records are maintained of all radioactive waste disposed.

10. Perform a review, at interval not to exceed 12 months, of the radiation safety program for adherence to ALARA concepts. Ensure that the radiation safety program is followed by all workers dealing with radioactive materials. Investigate any deviation from the program and take any remedial action necessary.

11. Schedule briefing and educational sessions to inform personnel of radiation safety rules and procedures:

1; for all new personnel,

2; each change in license condition or safety program and

3; at intervals not to exceed 12 months, in the refresher course for all personnel.

This includes instruction in the ALARA program and philosophy.

12. Take charge in all emergency situations, in the event of major or minor spills, or release of radioactive material, to ensure correct emergency decontamination and protection procedures are followed. Also, evaluate the situation that led to the emergency, to reduce the chance of reoccurrence.

13. Maintain or cause to be maintained, written records of all radiation safety committee meetings, actions, recommendations, and decisions.

RSO NAME: ~~Dr. Kent Allen, D.V.M.~~ Dr. D. Scott Taylor DVM

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ITEM: 11

TRAINING AND EXPERIENCE.

A: Authorized user

Radioactive material shall be used by/or under the

supervision of ~~Dr. Kent Allen, D.V.M.~~ *Dr. D Scott Taylor, DVM*

Enclosed please find his qualifications and training documents.

B: Radiation Safety Officer

~~Dr. Kent Allen, D.V.M.~~ *Dr. D Scott Taylor*

Enclosed please find his qualifications and training documents.

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ITEM. 12

Instrumentation

Survey meters:

A low-level survey meter for contamination surveys. A high-level meter to measure radiation exposure rates in the vicinity of generators and therapeutic quantities of radioactive material.

No:	Manufacturer's	Model No.	Probe Type	Range
1	Ludlum	14-C	P.G.M.	0 to 1000 mR

Dose Calibrator: To assay radiopharmaceuticals for activity to an accuracy of \pm 10% prior to administration.

Manufacturer's	Model No.	Number of Instruments Available
not applicable.		

Instruments Used for Diagnostic procedure and Other

Manufacturer's	Model No
G.E. Maxi Camera	PICKER DDC Digital Dyna Camera

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CALIBRATION OF INSTRUMENTS:

1. **Survey meters** are calibrated annually by a consultant or outside firm who is authorized by State or NRC. 2612 N. 7th Street, Phoenix, A.Z. 85006 LICENSE NUMBER: 7-123.

Methods for calibration of **dose calibrator.** not applicable.

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Item. 14

Facilities and Equipment

A. Facilities:

The Nuclear Medicine Department is located within the main building on a ground floor. (see attached map)

B. Equipment:

Syringe shield, absorbent material, lead-lined waste containers, lead vials and pigs, radiation warning signs, and long-handled forceps will be used ~~to~~ where it's practical to minimize radiation exposure to personnel.

C. Security:

The nuclear medicine department (Clinic Building) will be locked during non-working hours. During working hours at least one individual will be in the nearby area at all times.

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PROCEDURE FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL

1. The Radiation Safety officer or a designee is authorized a nuclear medicine technologist and/or radiology manager to order a radioactive materials and they will ensure that the requested materials and quantities are authorized by the license and that possession limits are not exceeded.
2. The RSO will establish and maintain a system for ordering and receiving radioactive material.
 - A. For routinely used materials:
 - a. Written records that identify the authorized user or department, isotope, chemical form, activity, and supplier will be made. In Many cases, the pharmacy prescription form may be adequate.
 - b. The above records will be checked to confirm that material received was ordered through proper channels.
 - B. For therapeutic dosages, dose of I-131 not applicable.
3. For deliveries during normal working hours, carriers will deliver radioactive packages directly to specified area. (See attached Map)
4. No radioactive material are delivered during off-duty hours. All radiopharmaceuticals and any other radioactive material authorized by the license will be obtained on a unit dose per patient basis from Syncor ARRA License #7-123., and/or other nuclear pharmacy or direct from manufacturer.

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PROCEDURES FOR OPENING PACKAGES CONTAINING RADIOACTIVE

MATERIAL

1. Radiopharmaceutical received from the local nuclear pharmacy will be recorded in the Rx form. (see attached form).
2. The following procedure shall be carried out for packages (containing radioactive material) received from manufacturer.
 - a. Put on waterproof gloves to prevent hand contamination.
 - b. Visually inspect packages for any sign of damage(i.e. Wetness, Crushed). If damage is noted, stop procedure and notify Radiation Safety Officer.
 - c. Measure exposure rate at 1 meter from the package surface and record. If > 10 milliroentgens per hour, stop procedure and notify Radiation Safety Officer.
 - d. Measure surface exposure rate and record. If > 200 mR/hr stop procedure and notify Radiation Safety Officer.
 - e. Open the package with following precautionary steps:
 - (1) Open the outer packages (following the manufacturer's directions, if supplied) and removing packing slip, and label on container.
 - (2) Open inner package and verify that contents agree with those on packing slip.
Compare requisition, packing slip, and label on container.
 - (3) Check integrity of final source container (i.e.,inspect for breakage of seal or

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- vials, loss of liquid, and discoloration of packaging material).
- (4) Check also that shipment does not exceed possession limits.
 - (5) If you suspect any leakage, then wipe external surface of final source container shield and remove wipe to low background area. Check wipe with a thin window G M meter, or well counter and take precaution against the spread of contamination as necessary.
 - (6) Monitor the packing material and packages for contamination before discarding.
 - (a) If contaminated, treat as radioactive waste.
 - (b) If not contaminated, deface radiation labels before discarding in the non-radioactive trash.
 - (c) Make a record of the receipt. (see attached form).

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GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL.

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.
2. Monitor hands and clothing for contamination after leaving restricted area.
3. Use syringe shields for routine preparation of patient dosages and administration to patients, except in those circumstances in which their use is contraindicated (e.g., recessed veins, infants). In these exceptional cases, consider the use of protective methods such as remote delivery of the dose (e.g., through use of a butterfly valve).
4. Do not eat, drink, smoke, or apply cosmetics in restricted area.
5. Do not store food, drink, or personal effects with radioactive material.
6. Each patient dose will be assayed in the dose calibrator prior to administration.
7. Wear personnel monitoring devices at all times in restricted areas.
8. Use the **TIME/DISTANCE/SHIELDING** formula at all times in restricted area.
9. Perform area and wipe survey for contamination. If any areas found above twice the background perform decontamination.
10. Transport radioactive material only in shielded containers.
11. Dispose of radioactive waste in designated receptacles.
12. Wear disposable gloves at all times while handling radioactive materials.
13. Never pipet by mouth.

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RECORDS OF RADIOACTIVE MATERIAL USE:

For each unit dosage received from nuclear pharmacy, we will use their Rx label as a record. If administered, we will record on Rx:

The measured activity in millicurie/microcurie.

Initials of the individual who made the record.

For multidose use: NOT APPLICABLE

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EMERGENCY PROCEDURE FOR RADIOACTIVE SPILLS.

MINOR SPILLS (Tracer activities)*

1. Notify person in the immediate area that a spill has occurred.
2. Cover the spill with absorbent paper to contain and prevent spread.
3. Limit access to the area to those persons dealing with the spill.
4. Survey persons involved before releasing them from the area.
5. Remove contaminated clothing and repeat survey to determine if skin contamination exists. Decontaminate skin surface with mild soap and cool running water. Do not use abrasive action.
6. Wash contaminated lab surface taking care not to spread spill or crosscontaminate. Survey area repeatedly to assess decontamination. If non removable contamination exists, restrict area and label appropriately.
7. Notify RADIATION SAFETY OFFICER and area Supervisor for further instruction.

MAJOR SPILLS (Greater than tracer activities)

1. Notify all persons not involved in the spill to vacate the area at once. Limit movement of displaced persons to confine the spread of contamination.
2. Cover the spill with absorbent paper to contain and prevent spread.
3. Remove the footwear and cover the floor if necessary to avoid tracking contamination and vacate the room or area.
4. Restrict access to the room.
5. Call for help, do not leave immediate area.
6. Remove contaminated clothing and place in plastic bag. Avoid further skin contact. Survey persons to check skin contamination. Decontaminate skin surface with mild soap and cool running water. Do not use abrasive action. Repeat personnel survey to verify decontamination.
7. Notify RADIATION SAFETY OFFICER and AREA SUPERVISOR for further instruction.

DOCUMENT: Please document the radioactive minor or major spill report on daily area survey form.

RADIATION SAFETY OFFICER: ~~Dr. Kent Allen, D.V.M.~~

D Scott Taylor DVM

AREA SUPERVISOR:

* TRACER ACTIVITY MEANS, SEE TABLE I-1, RELATIVE HAZARDS OF COMMON RADIONUCLIDE, ON PAGE 3 ATTACHMENT I, ITEM-17 IN ARRA GUIDE 10.8 REVISION 6/88.

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ITEM: 20

AREA SURVEY PROCEDURES

A. Survey Areas

1. In radiopharmaceutical, preparation and administration areas, survey at the end of the each day of use with an appropriate low-range survey meter and decontaminate if necessary.
2. The survey will consists of:
 - A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.01 mR/hr.
5. Wipe test will be performed Weekly.

The action level will be twice the background. See attached map.

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Item. 21

Waste Disposal

- A.** Solid waste, when generated, will be held in a plastic container and/or at the horse stables and/or Storage area (See Facility Map) for decay until radiation levels, as measured with a low level survey meter have reached background levels. The waste will then be disposed as normal trash.
- B.** Whenever possible all Liquid radioactive waste will be collected in plastic container. The collected liquid waste will be flushed down to drain with running tap water. The drain water is collected in to septic tank. All other time the liquid urine will be absorbed by saw dust and this dust will be collected and will hold for decay in stables AND/OR Storage area. All necessary radiation safety precautions will be followed to minimize any contamination and personnel exposure.

For detail see Item :25

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ITEM. 22

THERAPEUTIC USE OF RADIOPHARMACEUTICAL

There will be no use of radiopharmaceuticals for therapy at present.

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ITEM.23

THERAPEUTIC USE OF SEALED SOURCES

There will be no use of sealed sources at this facility.

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ITEM. 24

PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE

There will be no use of Xe-133 Gases at this facility.

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ITEM:25

PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIALS IN ANIMALS.

Animal Housing Facility

The Animal housing Facility is located in a separate building. There will be eight stalls for horses. A nuclear medicine department and a storage room and office room. This building has a lockable door. The animal facility is located on the ground floor. Each Stall is approximately 144 square feet. The floor is covered with saw dust. The animal that are going to have nuclear bone studies will be kept in the stables. In each Stall, there is a drain located at the back of the stall and connected to septic tank thus if necessary each stall is washable. A faucet is present with a hose to wash down the stable. (See attached Diagram). The nuclear medicine department is approximately 250 square feet and has a lockable door. ~~The floor is covered with saw dust.~~ There is a drainage at the northwest corner of the room, which is connected to septic tank. A faucet is present with a hose to wash the floor if necessary. Every effort will be made to collect the urine in a plastic container. After the study, an area survey will be performed. The small animal will be transported in cages to nuclear medicine department. After the study they will be kept in Stall. If necessary the minor and major procedure will be followed.

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Instruction to Animal Caretaker

The following instruction will be given to animal care taker for the handling of the animals, animals waste, and carcasses.

1. Wear protective clothing at all times when inside the stall area.
2. Follow good hygiene after handling the animals, such as washing your hands.
3. Do not eat drink smoke or apply cosmetics in the restricted area.
4. Wear personnel monitoring devices at all times in the nuclear medicine department and when working on animals.
5. Animals containing radioactive material are to be confined to the stable.
7. All stalls will be surveyed after releasing the horse. The reading are to be less than twice background. If not they will be held until they decay to background.
8. Any questions contact the radiation safety officer

~~Dr. Kent Allen~~ *Dr. Scott Taylor*

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The cleaning and decontamination procedure.

The stalls room have an exit opening in the front only.

A absorbent material such as saw dust will be placed on the floor of the stalls.

Every effort will be made to collect urine in plastic container if the horse is outside the stall. After 18 hours the animals will be removed from their stall and nuclear medicine personnel will survey the room with G.M. survey meter (PGM probe) for contamination.

If contamination is found the animal caretaker will locked the room for a day. If necessary the room will be decontaminated. The minor major spill procedure will be followed. This room will not be released until the survey reading is less than twice the back ground reading. All record will be recorded and filed by nuclear medicine.

If the animal reading is below 6 ^{at surface} mr/hr it will be released to the owner at this time. If not the animal will be held until the next day.

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Injection Procedure

A radionuclide will be ordered through a local nuclear pharmacy as a unit dose. The delivery personnel will deliver the radioactive material to the front office. The technologist or appropriate trained personnel will inject the radionuclide into the horse in the stall. A radiation tag or sign will be attached to the horse's stall. Only trained personnel will be admitted in the stall while the tag is on. After approximately two to four hours later the animal care taker will bring the horse to the nuclear medicine department for imaging. The caretaker will wear a lab coat and plastic boots when entering the stall and the horse's feet will be ^{picked out} ~~eiked~~ prior to taking out of the stall. All necessary precautions will be carried out to prevent any contamination. Every effort will be made to collect any liquid or solid waste in a plastic container when the horse is outside the stall. The waste will be stored in horse's stall for decay and the stall will be shut. A radiation sign will be posted at the storage room. If necessary the solid waste will be collected in a plastic container and plastic cover, any liquid waste will be flushed with running water near the drain. After the study the horse will be go back to the stall. The horse will be kept overnight until the next day. After each study an area survey will be performed. All involved personnel will be monitored for any contamination. All radioactive waste will be stored for at least ten half lives. A radiation survey will be made prior to release of waste in to normal trash.

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Security of Stable Area.

The building will be locked during off duty hours. Each stall firmly closed and latched, and only an authorized person will be allowed in any stall with a radiation warning tag on it.

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ITEM. 27

PERSONNEL DOSIMETRY AND BIOASSAY

The RSO will promptly review all exposure reports to look for workers whose exposure is unexpectedly high. All individuals who are occupationally exposed to radiation on a monthly basis will be issued a film or TLD whole body monitor. We will use

~~B.S. Landauer Jr. and Company~~ *ICN Dosimetry Service*

Total body film badges and TLD ring badges.

Bioassay Procedure

Participation: Not Applicable.

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ITEM. 28

LEAK TEST PROGRAM

No sealed sources will be used at this facility. No leak test required.

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ITEM: 30

ALARA PROGRAM

The radiation exposure at this location is will be below the alara level I.

The policy of this clinic is to keep the individual and collective radiation exposure of the staff, patients, and general public as low as reasonably achievable. I am committed to taking any measure to reduce radiation exposure that can be shown to be cost effective.

B. Goals:

1. Occupational exposure:

The aim of the ALARA program with regard to the exposure of the radiation workers is to keep their individual and collective exposure below the investigational level I (Table 1.)

2. Unrestricted area:

Radiation level in unrestricted area outside at this location will be kept at essentially background level. Radiation in unrestricted areas adjacent to radiation areas will be kept at the lowest practicable level.

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C. Implementation:

1. Review of exposure reports:

This institute hereby establishes investigational levels for occupational external radiation doses. (see table 1)

The radiation safety officer shall review the film badges reports as they are received.

He shall review the quarterly exposure of each radiation worker in light of the investigation levels. The RSO shall undertake to discover the probable causes of individual quarterly exposures that are above the investigation level I, but below investigation level II, by comparing them against the exposure of other employees doing the same work. The RSO may recommend steps to reduce the individual's exposure if, in his judgement, they will result in significant reduction in the exposure.

2. Corrective action:

If an individual's quarterly exposure exceeds investigation level II, the RSO, with the aid of a health physicist consultant if necessary, shall take such corrective action as may be necessary to reduce the exposure of that individual.

3. Annual review:

The RSO, with outside assistance if necessary, shall annually review the performance of the radiation protection program. Radiation protection practices and facilities shall be reviewed. Where improvements are found to be necessary in order to further the goal of the ALARA program, corrective action will be taken if found to be practical and cost-effective in reducing exposures.

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1. I will encourage all users to review current procedures and develop new procedure as appropriate to implement the ALARA concept.
2. The RSO will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
3. The RSO will establish procedure for receiving and evaluating the suggestions of individual workers for improving health physics practices and will encourage the use of those procedures.
4. I will evaluate our overall efforts for maintaining exposure ALARA on an annual basis. This review will include the efforts of the RSO, authorized users, and workers.

T A B L E : 1

INVESTIGATIONAL LEVELS

	LEVELS I	LEVELS II
1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	125	375
2. Hands and forearms; feet and ankles	1875	5625
3. Skin of the whole body*	750	2250

* Normally applicable to medical use operations except those using significant quantities of beta-emitting isotopes.