From: "Williams, Gary E" <Gary.Williams3@va.gov>
To: "William Snell" <WGS@nrc.gov>
Date: 08/20/2007 1:49:37 PM
Subject: RE: Tucson decommissioning

Bill,

I am attaching the inspection report, inspection record, and NOV reply.

You should note parts of the NOV reply were sent to you previously.

Gary E. Williams
National Health Physics Program
Veterans Health Administration
North Little Rock, Arkansas
(501) 257-1572

-----Original Message-----
From: William Snell [mailto:WGS@nrc.gov]
Sent: Monday, August 20, 2007 1:17 PM
To: Williams, Gary E
Cc: Cassandra Frazier; McGuire, Lynn; Huston, Thomas E.
Subject: Re: Tucson decommissioning

Gary,

New Mexico was great, thanks for asking.

I would like to continue working on the Tucson action, so I would appreciate getting the information as soon as possible so I can stay within our internal time committments.

Also, as I recall, during our previous conversation you indicated that you had given Tucson a violation for the lack of adequate surveys, etc. If you could provide documentation on that it would be helpful.

Bill

>>> "Williams, Gary E" <Gary.Williams3@va.gov> 08/20/2007 11:16 AM >>>
Bill,

I hope you enjoyed the hiking trip to New Mexico.

NHPP has a new program manager, Tom Huston, who will be helping with decommissioning issues in the future.

Tom and I are reviewing your request for additional information.

Gary E. Williams
National Health Physics Program
Veterans Health Administration
North Little Rock, Arkansas
(501) 257-1572

From: Williams, Gary E

Sent: Wednesday, July 25, 2007 10:15 AM
To: 'wgs@nrc.gov'
Cc: 'cff@nrc.gov'; Lynn McGuire (McGuire, Lynn)
Subject: RE: Tucson decommissioning

For clarification, I will list the questions for response.

Since the building was demolished some of the applicable information might not be available.

Questions from Bill Snell about the Tucson decommissioning

Did the permittee survey the drains in the building?

Did the permittee survey for fixed contamination?

How was background determined?

What release criteria were used?

What counting statistics are available such as calibrations, efficiencies, minimum detectable activity determinations, and reference
standards?

Are calibration certificates for the survey instruments available?

Was an incinerator present in the building?

If so, what is the status for the former incinerator?

Did the building have any hold-up tanks and what were the survey results?

Gary E. Williams
National Health Physics Program
Veterans Health Administration
North Little Rock, Arkansas
(501) 257-1572

From: Williams, Gary E
Sent: Wednesday, July 25, 2007 10:05 AM
To: 'wgs@nrc.gov'
Cc: 'cff@nrc.gov'; Lynn McGuire (McGuire, Lynn)
Subject: Tucson decommissioning

Bill,

Thanks for the update on Tucson.

I will attempt to obtain the additional information that you request.

Gary E. Williams
National Health Physics Program

Veterans Health Administration
North Little Rock, Arkansas
(501) 257-1572

CC: "Cassandra Frazier" <CFF@nrc.gov>, "McGuire, Lynn" <Lynn.McGuire@va.gov>, "Huston, Thomas E." <Thomas.Huston2@va.gov>

Mail Envelope Properties (46C9E1FA.93D : 4 : 14653)

Subject:	RE: Tucson decommissioning
Creation Date	08/20/2007 1:29:52 PM
From:	"Williams, Gary E" <Gary.Williams3@va.gov>
Created By:	Gary.Williams3@va.gov

Recipients

nrc.gov
ch_po.CH_DO
WGS (William Snell)
CFF CC (Cassandra Frazier)

va.gov
Thomas.Huston2 CC (Thomas E. Huston)
Lynn.McGuire CC (Lynn McGuire)

Post Office	**Route**
ch_po.CH_DO	nrc.gov
	va.gov

Files	**Size**	**Date & Time**
MESSAGE	2932	08/20/2007 1:29:52 PM
2006 12 21 Tucson Insp Rpt.pdf		207826
2007 01 17 Tucson NOV Reply.pdf		1003452
2006 12 21 Tucson Insp Rcd.pdf		281849
Mime.822	2048690	

Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Junk Mail Handling Evaluation Results

Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered

Junk Mail handling disabled by User

Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

VHA National Health Physics Program Inspection Record

Inspection report number: 678-06-I01

Permit number: 02-06186-01

Permittee (name and address):

Southern Arizona VA Health Care System
3601 South 6th Avenue
Tucson, Arizona 85723

Locations of use being inspected: Same as above.

Permittee contact (name and telephone number): F. Swailem, Ph.D., 520-629-1832

Permit priority: 3

Permit program code: 2120/3610

Date of last inspection: NHPP – November 25, 2003; NRC – July 16-17, 2003

Date of this inspection: November 15 through December 1, 2006

Type of inspection:

( ) Announced (X) Unannounced
(X) Routine ( ) Special
( ) Initial

Next inspection date: December 2009 (normal, unless modified by NHPP inspection algorithm)

Summary of findings/actions:

( ) No violations (NHPP Form 591 issued)
( ) Severity Level IV and/or non-cited violations (NHPP Form 591 issued)
(X) Severity Level IV and/or non-cited violations (NHPP inspection report ~~and Form 591 issued~~)
( ) Severity Level I, II, or III violations (NHPP inspection report and NOV issued)
( ) Follow-up on previous violations

Inspector(s): Joseph R. Wissing Date: December 21, 2006
Joseph Wissing

Approved: E. Lynn McGuire Date: 12/21/06
E. Lynn McGuire, NHPP Director

PART I - PERMIT, INSPECTION, INCIDENT/EVENT, AND ENFORCEMENT HISTORY

1. AMENDMENTS AND PROGRAM CHANGES:

a. VHA Permit Amendment No. 74 (approved April 13, 2005). The amendment modifies the permit condition for decay-in-storage to remove the 10 half-lives requirement and included National Radiation Safety Committee approval to issue a revised standard permit condition for sealed source inventories and security. The change is approved under Nuclear Regulatory Commission Regulatory Issue Summary 2004-17.

b. VHA Permit Amendment No. 73 (approved December 2, 2004). Permit renewal based on request of October 1, 2004.

2. INSPECTION AND ENFORCEMENT HISTORY:

a. Follow-up or corrective actions for most recent NRC inspection: NRC Inspection conducted on July 15-16, 2003, did not identify any violations.

b. Follow-up or corrective actions for most recent NHPP inspection: NHPP inspection on November 25, 2003, did not identify any violations. NHPP inspection record (678-03-I01) recommended review of close-out surveys for waste storage shed.

c. The permit does not have any significant regulatory enforcement history.

3. INCIDENT/EVENT HISTORY:

Over exposures or medical events have not been identified or reported in last two years. Results from the Nuclear Materials Events Database review identified no listings relevant to the authorized locations of use on the permit.

PART II - INSPECTION DOCUMENTATION

1. ORGANIZATION AND SCOPE OF PROGRAM:

The Southern Arizona VA Health Care System, Tucson, Arizona, conducts a radiation safety program under a VHA MML Permit of limited scope medical and broad scope research uses. The permit authorizes these uses at 3601 South 6th Avenue, Tucson, Arizona.

Nuclear Medicine Service utilizes unit dose radiopharmaceuticals received from a commercial radiopharmacy. Nuclear medicine procedures are not routinely performed outside of normal working hours. Occasionally, administrations of radiopharmaceuticals requiring written directives are performed.

2 authorized users are approved by the RSC, for the use of radioactive materials for non-human research. Human research using radioactive materials is not performed. At the time of the inspection, no authorized areas for non-human research contained radioactive material. Authorized users for non-human research have not received or used radioactive materials in the past twelve months. The RSO is in the process of reviewing users and associated authorized areas for closeout.

The radiation safety program staff consists of the Radiation Safety Officer(RSO). The RSO performs audits, radiation safety training, certain transportation duties of radioactive materials, and equipment calibrations. Other radiation safety program responsibilities are delegated to staff in research and nuclear

medicine. The RSO performs reviews of radiation safety operations at least quarterly.

The RSO has complete autonomy with regard to radiation safety program implementation and stop-work authority to manage the health care system radiation safety program and achieve program goals and objectives as coordinated with the permittee's Radiation Safety Committee (RSC) and executive management. The permittee maintains a library with regulations contained in 10 CFR, Nuclear Regulatory Commission guidance documents including the recent security bulletin, VHA directives and handbooks, access to the NHPP Web site, and previous copies of the NHPP *Scatterings* newsletters.

2. INSPECTION SCOPE AND NRC INSPECTION PROCEDURES USED:

The inspection reviewed all items contained in the inspection plan approved by the NHPP Director. The inspection was oriented to a risk-informed, performance-based evaluation of the radiation safety program and interviews with staff, observations of radiopharmaceutical handling procedures, package survey and check-in procedure, shipping and receipt of byproduct material, and security of byproduct material. The inspector observed nuclear medicine staff work routines to determine how radiopharmaceutical doses were assigned, how dose information was recorded, and how staff followed their delegated radiation safety program responsibilities. Specific written records reviewed back to the last NHPP inspection included personal dosimetry records, annual radiation safety program reviews, RSC meeting minutes, and internal radiation safety program audits..

For the NRC inspection procedures, the inspector used the focus areas identified in the inspection procedures (i.e., security and control of radioactive materials, shielding, comprehensive safety measures, dosimetry, instrumentation and surveys, training and practices, and Radiation Safety Committee/RSO/Management oversight) and determined the adequacy of the radiation safety program following a performance-based approach.

NRC inspection procedures used for this inspection were IP 87131, "Nuclear Medicine Programs - Written Directive Required;" and IP 87104, "Decommissioning Inspection Procedures for Materials Licenses;" and IP 87126, "Industrial/Academic/Research Programs".

3. INDEPENDENT AND CONFIRMATORY MEASUREMENTS:

Area survey measurements were taken with the inspector's survey meter, Shadow Model 4020, Serial Number 004254, with a pancake GM detector, last calibrated on March 20, 2006. All area exposure readings in the hot laboratory area measured 0.07 mR/hr or lower. Areas with radiopharmaceutical waste and unit doses are adequately shielded. Imaging areas, hallways, waste storage areas, and patient waiting areas measured background radiation levels (0.02 mR/hr). Research laboratories measured background radiation levels (0.02 mR/hr). No radioactive contamination was found in areas where it would not be expected. No radiation exposure rates were found that would cause regulatory limits to be exceeded or were contrary to the ALARA philosophy.

4. VIOLATIONS, NCVs, AND OTHER SAFETY ISSUES:

a. The inspector identified one violation of NRC requirements.

(1) The permittee violated NRC requirements for failing to obtain a permit amendment closing out and decommissioning Building 32, an area used for storage and disposal of radioactive materials, prior to its demolition on November 16, 2004. 10 CFR 30.34(c) requires permittees in this part and parts 31 through 36 and 39 shall confine possession and use of the radioactive material to the locations and purposes authorized in the permit. Further, 10 CFR 35.13 requires that a permit amendment be obtained prior to adding to or changing the areas of use identified in the application or on the permit, except for areas of use

where byproduct material is used only in accordance with either 10 CFR 35.100 or 10 CFR 35.200.

(2) The inspector noted that the violation was not willful or repetitive, did not represent a careless disregard for regulatory compliance, and did not pose a significant health and safety risk. Based on the NRC Enforcement Manual, and that the permittee failed to identify the violations, the violation is categorized as level IV.

b. The inspector noted the following areas for permittee's RSC review and action. The following should be reviewed during the next inspection.

(1) The inspector noted that authorized users for radioactive material use have not received or used radioactive materials for an extended period of time (more than 1 year). All radioactive material in individual laboratories with the exception of generally licensed sources in liquid scintillation counters was removed by the RSO. The inspector recommended during the inspection and exit briefing the permittee begin the process of closing out research use of radioactive material and an associated amendment request to remove the authorization for non-human research use of radioactive material.

(2) The inspector noted that an assessment of public exposure from radioactive materials has not been performed in the past two years. Based on previous assessments and inventories of radioactive materials received, an exposure to the public exceeding regulatory levels is highly unlikely. The permittee committed to completing an assessment of public exposure for the 2006 calendar year, continue this assessment annually, and include this assessment as part of the annual radiation safety program annual review presented to the RSC.

5. PERSONNEL CONTACTED:

R. Shifman, M.D., Chief of Diagnostics [1,2]
T. Walsh, D.O., Chief of Nuclear Medicine Service [3]
J. Nelson, AO for Research Service [3]
F. Swailem, Ph.D., Radiation Safety Officer [1,2,3]
D. Montegomery, Ph.D., Authorized User in Research Service [3]
S. Morrison, CNMT, Nuclear Medicine Technologist [2]

1. Attended entrance meeting
2. Attended exit meeting
3. Present or participating in the inspection

Note: A representative of executive management was not available for the entrance or exit meeting.

Department of Veterans Affairs

Memorandum

Date: JAN 17 2007

From: Director, Southern Arizona VA Health Care System, Tucson, AZ 85723 (678/0-00)

Subj: Inspection of Radiation Safety Program

To: Director, VHA National Health Physics Program North Little Rock, AR 72114(115HP/NLR), Thru: Network Director, VISN 18 Mesa, AZ(10N18),

1. This is a response to the inspection of our radiation safety program conducted by Joseph Wissing and yourself on November 15, 2006.

2. Dr. Swailem, SAVAHCS Radiation Safety Officer, indicated that the cause for this violation is the decommissioning of the old storage building 32 and moving the radioactive waste to the new location at building 78 was at the time of renewal of our VHA permit number 02-06186-01; there was no need to request for additional amendment. The site plans for the old and new buildings were included under attachment A, Facility Diagrams, of the renewal. Dr. Swailem spoke with Michael C. Simmons, Inspector, who was reviewing our permit renewal and understands the need to keep the decommissioning report for future VHA NHPP or NRC inspections.

3. In order to correct the violation, Dr. Swailem faxed the required information to Joe Wissing immediately after the inspection on 11/20/2006. In addition, a formal request for SAVAHCS materials permit amendment is enclosed.

4. SAVAHCS' Radiation Safety Committee will review and evaluate the VHA NHPP radiation safety inspection report to ensure the violation does not reoccur.

5. Should you have any questions, please contact our Radiation Safety Officer, Fayez M. Swailem, Ph.D., at (520) 629-1832.

Jonathan H. Gardner, FACHE

Attachment: Request for materials permit amendment.

Department of Veterans Affairs

Memorandum

Date: JAN 17 2007

From: Director,Southern Arizona Health VA Care System, Tucson, AZ 85723 (678/0-00)

Subj: Inspection of Radiation Safety Program

To: Director, VHA National Health Physics Program North Little Rock, AR 72114 (115HP/NLR)
Thru: Network Director, VISN 18 Mesa, AZ (10N18)

1. We request amendment of our VHA byproduct materials permit number 01-06186-01 to close out and decommission the old radioactive waste storage building 32. Attached is the decomissioning report, site plans of the building, miniutes of the radiation safety committeee meeting on December 2, 2004, indicating approval of the decommissioning report and a copy of the annual radiation safety audit/review for the year 2004 reflecting the decomissioning report.

2. We request addition of room 101 Building 76 (attached is a copy of the site plan) as the new radioactive waste storage area.

3. Should you have any questions, please contact our Radiation Safety Officer, Fayez M. Swailem, Ph.D., at (520) 629-1832.

Jonathan H. Gardner, FACHE

2 Attachments:
1 Building 32 (decommissioning report, site plans, minutes of the radiation safety committee meeting on December 2, 2004 and a copy of the annual radiation safety audit/review for the year 2004)
2 Site plan of building 76.

Southern Arizona VA Health Care System (SAVAHCS)
Tucson- Arizona
RADIATION SAFETY OFFICE

DECOMMISSIONING OF A RADIONUCLIDE USE AREA

Date of Decommissioning: November 8, 2004
Decommissioning Area: Building 32 (Radionuclide waste storage building).
Room (s): East & West rooms.
Radionuclide Permit Holder (s): Radiation Safety.
Permit Number: NA.
Radionuclides Used in the Area: All under SAVAHCS's NRC License.
Date last used Isotopes: Last radioisotope waste storage on September 1, 2004.
Reason of Decommissioning: Releasing the building for demolition as per Engineering request.

Results of the Survey:

1- Radiation Exposure Rate:
Equipment: Ludlum model 2241-2, Serial 150611, Probe BGO (β, γ) model 44-98, serial 150698, 10% ^{14}C, 20% ^{125}I, Background 55cpm/μCi/hr, last calibrated on 08/03/04.
Results: Below 0.05 mR/hr all areas (20 spots each room).
2- Smear Wipe Survey:
Equipment: Beckman Liquid Scintillation spectrometer model 6500, 015-247971F, Efficiency (wide open window) 3H 60%, ^{14}C 95 %, BG: 50 dpm.
Results: Below 150 dpm/100 square centimeter all areas (20 spots each room).
3- Sealed Sources: None existed.
4- Spills with remarkable contamination: None existed.
5- Source vials, and labeled products: Removed.
6- Radioactive waste: Collected and transferred to the new storage, building 76.
7- Radioactive signs and labels: Removed.

ACTION: The rooms were decommissioned and released to general use.

Surveyor

For

Fayez M. Swailem, Ph.D.

DEPARTMENT OF VETERANS AFFAIRS
SOUTHERN ARIZONA VA HEALTH CARE SYSTEM
TUCSON, ARIZONA

RADIATION SAFETY COMMITTEE MEETING

1. The Radiation Safety Committee meeting was held on Thursday December 2, 2004 at 1:00 p.m. in the Dental Conference Room 169, Bldg 56. The following persons were present:

Travis Kent Walsh, D. O. Chairperson
Fayez M. Swailem, Ph.D., Radiation Safety Officer.
Midge B. Adams for Julianne French, Admin Assistant to CMO, Management Representative.
Jeanne Nordstrom, Industrial Hygienist, Facilities Management.
Jedd Nelson, Admin. Officer, Research HCG.
Edward Ohnesorgen, R.T., Chief Technologist, Diagnostic Radiology

2. Excused:
John Galgiani MD, Research HCG
Douglass Morrison MD, Cardiology Section
Eve Broughton, RN, CNM, Managed Care.

3. The Committee reviewed and approved unanimously the minutes of the September 9, 2004 meeting.

4. Old business (Open Items):
Status of the new waste storage facility: Building 32 (old radionuclide waste storage building, East and West Rooms) was decommissioned by the RSO according to NRC regulations on November 8, 2004. The decommissioning record contains results of the survey, radiation exposure rates, smear wipe survey, and removal of sources, waste and radiation signs. A copy of the decommissioning report was presented to the RSC for approval. The building was demolished on November 16, 2004.
Action: The report was approved unanimously. Keep copy for future NRC & NHPP audits and inspections. Close item.

5. PERSONNEL RADIATION EXPOSURE AND ALARA REVIEW:

a) No radionuclide worker exceeded the ALARA I quarterly limit of total effective dose equivalent of 125 millirem to the whole body during the third calendar quarter of 2004.

b) No X- ray worker exceeded the ALARA I quarterly limit of total effective dose equivalent of 125 millirem to the whole body during the third calendar quarter of 2004.

c) The Medical Center (SAVAHCS) continues to monitor radiation doses to the public according to NRC regulations 10CFR20.1301 (the total effective dose equivalent to individual members of the public does not exceed 0.1 rem in a year and the dose in any unrestricted area from external sources does not exceed 0.002 rem in any one hour).

Action: None required.

6. INSPECTIONS AND AUDITS:

Inspection and audits for the third calendar quarter, 2004 have been completed in 28 labs, clinics and service areas on September 30, 2004 with the following conclusions:

a) All smear surveys are below 150 dpm/100 square centimeter.
b) Except as noted above, all radiation exposure rates are below 0.05 mR/hr.
c) No significant radiation safety violations are noted.

Action: None required.

7. WEEKLY "WALK-THROUGH INSPECTIONS:

In response to NRC notice of violation, dated May 6, 1991, the TVAMC director issued a letter; # 678/115 dated May 31, 1991. The Medical Center committed that the Radiation Safety Officer will be required to conduct "walk-through" inspections of all radioactive material use areas once each week at varying times of the day. A log will be kept of each inspection and will be reviewed by the Chairman of the Radiation Safety Committee on monthly basis. Results of the survey will be reported to the Radiation Safety Committee as is presently done. The Radiation Safety Committee in their meeting on February 5, 2004 decided to keep this inspection in a monthly basis instead of weekly basis for a year and to evaluate the results accordingly.

The inspection covers 28 radioactive material use areas in the Medical Center. The results of this inspection for the third calendar quarter 2004 (June 30, 2004 to September 30, 2004) reveal no significant radiation safety violations.
Action: None required.

8. RADIONUCLIDE PERMITS AND AMENDMENTS:

Dr. T. Kent Walsh, Director of Nuclear Medicine, requested approval of his clinical study "A Phase III, Randomized, Double blind study of Intravenous CVT-3146 vs. Adenoscan on patients undergoing stress Myocardial Perfusion Imaging, MPI (protocol; # CVT5131) (with amendments I, II, III, and IV incorporated). Patients will administer the regular Technetium Tc99m Sestamibii doses and will have imaging scan using a gamma camera. The research protocol was examined by RSO and granted administrative approval on Oct 19, 2004.
Action: The research protocol was approved unanimously

9. ANNUAL AUTHORIZATION OF NUCLEAR MEDICINE PHYSICIANS AND STATEMENT OF RECENTNESS OF TRAINING

The requirement of the Medical Center's (SAVAHCS) License is that the Radiation Safety Committee will examine and approve/or disapprove the privileges for use of isotopes in or on humans for qualified physicians who meet the criteria established in 10CFR35, Subpart J. According to 10CFR35.59, the training and experience specified in Subparts D, E, and J of 10CFR35 have been obtained by these physicians within the last 7 years.

(A) The following physicians are certified in Nuclear Medicine by the American Board of Nuclear Medicine, and have classrooms and laboratory training in isotope handling techniques required in Subpart J -10CFR35.910, 10CFR35.920, and 10CFR35.930. They were approved by the RSC on November 20, 2003 on use of unsealed byproduct material as specified in 10CFR35.100, 10CFR35.200, and 10CFR35.300.

1- Jayendra H. Shah, M.D.	Chief Medical Officer at SAVAHCS.
2- Travis Kent Walsh, D.O.	Program Director, Nuclear Medicine, SAVAHCS.
3- Walter H. Williams, M.D.	Consultant Physician at SAVAHCS.
4- James M. Woolfenden, M.D.	Consultant Physician at SAVAHCS.
5- Mihai Florin Iancu MD.	Physician at SAVAHCS

(B) The following physicians are certified by the American Board of Radiology and have classroom, laboratory training for diagnostic nuclear medicine procedures required in 10CFR35.910 and 10CFR35.920. They were approved by the RSC on November 20, 2003 on use of unsealed byproduct material as specified in 10CFR35.100 and 10CFR35.200.

1- Kim Maria Wilson, M.D.	Physician at SAVAHCS
2- Jennifer Nicole Alcala, MD.	Physician at SAVAHCS

10. RADIOLOGICAL RESPONSE WORK GROUP:

Tucson Fire Department conducted a 4-hour decontamination training session at SAVAHCS on Monday December 13, 2004. Twenty-three individuals participated in the training including Dr Swailem. Also, the radiation detection equipment, previously ordered for the Radiological response team, was delivered. The equipment will be kept at the LSU after finishing the new construction. Dr Swailem will train the group on using these equipment.
Action: None required.

11. LEADED APRONS STATUS:

Dr. Swailem reported on purchasing 7 leaded aprons to OR, 6 thyroid shields to Imaging and one leaded apron to Research. All have been logged into the inventory database. Edward Ohnesorgen reported on 30 to 35 % discrepancy in leaded aprons inventory in the Medical Center as audited recently. He said that most of the leaded aprons lost are in the Cath Lab where 22 aprons were not found. This will be a problem with the coming JCAHO inspection.
Discussion: Both points of contact (purchasing and warehouse) should be addressed by the management to follow the following procedure carefully. First: No one can purchase lead aprons without approval from RSO and from Rad Safety control point 056. Second: All delivered lead

aprons (and all lead personal shielding devices) should be delivered to RSO in Nuclear Medicine. This way when RSO get the shipment from the warehouse, he will call Leaded aprons database master in Imaging, check the shipment against purchase order, mark the aprons and log it in our inventory log, and finally send it to the requesting department. This way, we will have full control on our inventory. For aged aprons or ones that failed the biannual testing, it will be removed from service, deleted from our inventory and delivered to Jeanne Nordstrom for disposal/recycling. In addition, every service should identify a person who will be responsible for their leaded aprons inventory.
Action: A Center memorandum is needed to address this issue.

12. SAVAHCS Material Permit Renewal:

On October 1, 2004, application letter signed by Mr. Gardner was sent to Director, VHA National Health Physics Program regarding renewal of SAVAHCS material permit number 02-061-86-01. The application contains NHPP form 313 signed by SAVAHCS director, Renewal documentation, attachments, and facility diagram. Michael Simmons, NHPP manager, contacted Dr Walsh and Dr. Swailem requiring additional information in order to proceed with the renewal application. On November 17, 2004, Dr Swailem mailed the requested information to NHPP headquarter in Little Rock, Arkansas.
Action: Open item. Report next meeting.

13. There being no further business, the meeting was adjourned at 1:55 p.m. The next meeting will be in three months at a date to be set.

Travis Kent Walsh, D.O.
Chairman, Radiation Safety Committee

Fayez M. Swailem, Ph.D.
Medical Physicist/RSO

Southern Arizona VA Health Care System
Tucson - Arizona
Radiation Safety office

Annual Radiation Safety Audit/Review
Jan 1 - Dec. 31, 2004

Date : February 17, 2005

The following reflects the current state and future directions of the Radiation Safety Program. The Radiation Safety Committee continues to overseas the Radiation Safety Program and report activities to the medical Center's top management.

A. Quality:

1. Radiation Safety Inspections:

None for this year.

2. SAVAHCS Material Permit Renewal:
SAVAHCS material permit number 02-06-186-01 was renewed by the VA National Health Physics Program. The new permit will expire on December 31, 2009.

3. Medical Center Radiation Safety Program - An Overview:
This program is directed by the Radiation Safety Committee (RSC). The RSC met four times during the year 2004: on February 5, April 29, September 9, and December 2, 2004 to review the program and to set policy or make recommendations to management. Fayez Swailem, Ph.D. (the RSO) implemented the program and overseas the operations on a day to day basis.

4. The Quality Management Program:
According to 10 CFR 35.32, the Medical Center implemented the Quality Management (Q.M.) program to provide high confidence that byproduct material or radiation from byproduct material used for therapy will be administered as directed by the authorized users. During calendar year 2004, 11 patients were treated in Nuclear Medicine with therapeutic doses of I-131, one with Sm-153. The Program was audited on January 20, 2005 and the summary was reviewed by the Program Director, Nuclear Medicine and the Chairman of the RSC. The program is in 100%compliance.

5. Compliance with the EPA Standards of Radionuclide Emissions:
The regulations of the Environmental Protection Agency (EPA) and the provisions of the Clean Air Act require annual evaluation of radionuclide emissions from all facilities licensed by the Nuclear Regulatory Commission (NRC). The results of evaluations are

compared with standards developed by the EPA to assure that the Effective Dose Equivalent (EDE) from all radionuclides to a member of the public exposed to these emissions does not exceed 10 millirem/year and that the EDE from radionuclides is less than 3 millirem/year. The 10 mrem value, while 10% of the NRC limits for the allowable effective dose equivalent for individual members of the public, is acceptable to our facility. An annual evaluation of radionuclide emissions from incinerated radioactive materials from the Medical Center was performed and reported to the EPA regional office. The calculated Effective Dose Equivalent is 0.1 mrem/y that complies with the EPA regulations.

6. Radioactive Sources and Equipment Checks:

As per NRC regulations, all sealed sources were leak tested every six months (on Jan 23 and July 15, 2004) and checked for inventory every calendar quarter (on March 30, June 25, Sep. 30, and Dec. 31, 2004). Survey meters are calibrated once a year. Nineteen radiation monitors and 16 pocket dosimeters were calibrated by the Health Physics consultant on October 2004. At present, all are functioning very well. Other equipment such as the dose calibrator, the single channel analyzer, well counter and thyroid uptake systems are periodically checked and calibrated by the RSO. The dose calibrator was checked daily for constancy, quarterly (on 1/2, 4/1, 7/2, and 10/4, 2004) for linearity by the kit method and on January 19, 2004 using decaying source method, and on Jan 16, 2004 for accuracy and geometry.

7. Monitoring, Calculating, and Controlling Radioactive Gas Releases:

As per 10CFR20 and 10CFR35, the Medical Center complied with the regulations concerning monitoring, calculating, and controlling the release of radioactive gases (such as Xenon-133). Air flow was measured in Nuclear Medicine rooms where Xe-133 gas is used for ventilation studies. The rooms should be under negative pressure and these measurements should be done in intervals not exceeding 6 months. The measurements were done on 3/9/2004 , 6/21/2004, and 8/23/2004 and the rooms are under negative pressure. The efficiency of the Xe-133 trap was measured on 4/30/2004 and on 10/21/2004. Also, the trap was tested monthly during 2004. RSO has calculated the worker's dose from concentration of Xe-133 in work area, concentration of Xe-133 in unrestricted area (dose to the public), and emergency procedures in case of spilled Xe-133 gas in Nuc Med room. The results of these calculations are available at RSO office and are posted in Nuclear Medicine rooms.

B. Productivity:

1. Monitoring of Personnel Radiation Exposure:

As per NRC 10CFR20.1201 (Standards for Protection against Radiations implemented on January 1994), the annual total whole body effective dose equivalent limit is 5 rems, the eye dose equivalent is 15 rems, and the shallow dose equivalent is 50 rems to the

skin or each of the extremities. However, the NRC "ALARA" (As Low As Reasonably Achievable) program requires that radionuclide workers be kept below 10% of this limit (500 mrem in a year and 125 mrem in a calendar quarter).

During 2004, 357 employees from 15 services wore film badges to monitor radiation exposure. The monitoring devices are exchanged each month and the film badge contractor supplies us with monthly radiation exposure reports that were reviewed by the RSO and the Chairman of the RSC. No radionuclide worker exceeded the ALARA limit of total effective dose equivalent of 125 millirem to the whole body during any calendar quarter or the 500 mrem limit during the year 2004.

b) No X- ray worker (including Cardiology Cath-lab) exceeded the ALARA I quarterly limit of total effective dose equivalent of 125 millirem to the whole body during any calendar quarter of 2004 or the 500 mrem limit during the year 2004. This achievement is due to the active program of investigation, education, training and collaboration with the Radiation Control Office of the University of Arizona regarding monitoring overexposure to fellows and medicine residents who wear film badges from both institutions.

2. Radiation Monitoring of the Public:

As per the new NRC 10 CFR20.1301, each licensee shall monitor radiation doses to the public within their premises so that the total effective dose equivalent to individual members of the public from the licensed operations does not exceed 100 mrems in a year and the dose in any unrestricted area from external sources does not exceed 2 mrems in any one hour.

SAVAHCS contracted Global Dosimetry Solutions, Inc. (formerly CN Dosimetry Services) to supply ten sensitive TLD devices (aluminum oxide X9 low level monitors) for cumulative exposure monitoring. These dosimeters are exchanged every calendar quarter. During 2004, the maximum radiation exposure in any unrestricted area did not exceed 35 μR/hr and the maximum detected cumulative radiation dose did not exceed 20 mrem in a calendar quarter. Records of these surveys are available at the RSO office.

3. Radionuclide Permits and Contamination Surveys:

The RSC, upon recommendation of the RSO and after reviewing the qualifications of the person requesting a permit, may issue permits to research investigators to use or purchase radionuclides at the Medical Center. At the end of 2004, there were no active permits for radioisotope use at SAVAHCS. Each radioisotope permit holder must provide the RSO with a monthly survey, radionuclide inventory and liquid waste disposal for each lab or usage area specified in his/her permit. Laboratory areas where more than 200 micro Curies of radioactive materials are being used at any one time should be surveyed weekly.

Daily contamination monitoring and weekly smear surveys are performed within the Nuclear Medicine Service because of the large quantities of radionuclide used. In addition, the RSO conducts a "walk through" inspection at different times of the day at

least once a week, and performs a full inspection and audits quarterly on each radionuclide usage area in the Medical Center. Each permit holder must get pre-approvals of the RSO before purchasing any radioisotope. This allows the RSO to manage the process better, not to exceed the possession limit for each permit, and to be within the Center's possession limit granted by NRC.

All radionuclide users were in full compliance about surveys and inventory control. The quarterly inspections and audits showed compliance with radiation safety precautions. Radiation safety violations and compliance of radionuclide users were discussed in the Radiation Safety Committee meetings and appropriate correction actions were taken.

4. Radioactive Waste Management (Storage and Disposal):

Storage and disposal of solid and liquid waste are controlled by NRC regulations that restrict specific periods of time for storage and limits of disposal. SAVAHCS has an effective radioactive waste program managed by the RSO. We have two isolated rooms in Bldg 32 for storage of waste, three sinks to dispose radioactive waste and an incinerator to burn radioactive solid waste. Overall, the program of radioactive waste pickups, logging, sorting, storage for decay, monitoring and finally disposing is functioning well. For specific kinds of waste, such as animal carcasses and animal bedding containing Fe-59 or I-125 that requires storage in the freezer for a year or two, we have two freezers in Building 32 (volume of about 1.7 cubic meters), in addition to freezer space available in research labs. The unoccupied freezer space in Building 32 is about 1.2 cubic meters. Because of the restricted policy (based on the recommendations of the National Low-Level Waste Management Program, 1995) and the efforts done by the RSO, we have a dramatic reduction of the volume of the Decayed in Storage (DIS) radioactive waste generated in the Medical Center. The Radioactive Minimization Techniques are cost effective and have saved considerable money for the Medical Center.

Recently, Engineering decided to shut down the incinerator permanently. ?

Status of the new waste storage facility: Building 32 (old radionuclide waste storage building, East and West Rooms) was decommissioned by the RSO according to NRC regulations on November 8, 2004. The decommissioning record contains results of the survey, radiation exposure rates, smear wipe survey, and removal of sources, waste and radiation signs. A copy of the decommissioning report was presented to the RSC for approval. The building was demolished on November 16, 2004.

The report was approved unanimously. RSO will keep copy for future NRC & NHPP audits and inspections.

5. Annual Authorization of Nuclear Medicine Physicians and Statement of Recentness of Training

The requirement of the Medical Center's (SAVAHCS) License is that the Radiation Safety Committee will examine and approve/or disapprove the privileges for use of isotopes in or on humans for qualified physicians who meet the criteria established in 10CFR35, Subpart J.

According to 10CFR35.59, the training and experience specified in Subparts D, E, and J of 10CFR35 have been obtained by these physicians within the last 7 years.

(A) The following physicians are certified in Nuclear Medicine by the American Board of Nuclear Medicine, and have classrooms and laboratory training in isotope handling techniques required in Subpart J -10CFR35.910, 10CFR35.920, and 10CFR35.930. They were approved by the RSC on November 20, 2003 on use of unsealed byproduct material as specified in 10CFR35.100, 10CFR35.200, and 10CFR35.300.

1- Jayendra H. Shah, M.D. Chief Medical Officer at SAVAHCS.
2- Travis Kent Walsh, D.O. Program Director, Nuclear Medicine, SAVAHCS.
3- Walter H. Williams, M.D. Consultant Physician at SAVAHCS.
4- James M. Woolfenden, M.D. Consultant Physician at SAVAHCS.
5- Mihai Florin Iancu MD. Physician at SAVAHCS

(B) The following physicians are certified by the American Board of Radiology and have classroom, laboratory training for diagnostic nuclear medicine procedures required in 10CFR35.910 and 10CFR35.920. They were approved by the RSC on November 20, 2003 on use of unsealed byproduct material as specified in 10CFR35.100 and 10CFR35.200.

1- Kim Maria Wilson, M.D. Physician at SAVAHCS
2- Jennifer Nicole Alcala, MD. Physician at SAVAHCS

6. Relocation of Radionuclide Research labs:
There were no relocations of any radionuclide research labs during 2004.

7. Radionclide Spills and Contamination:
There were no radionuclide spill incidents during the year 2004 .

8. Misadministration and Recordable Events.
There were no recordable events during the year 2004.

9. Quality Control of Nuclear Medicine Equipment:
The quality control program for Nuclear Medicine equipment describe procedures for daily, weekly, monthly, quarterly and yearly quality control of the gamma cameras, survey equipment, dose calibrator, well counter, MCA counter, and thyroid uptake system. The program was implemented by Nuclear Medicine and meets the JCAHO standards.

10. Miscellaneous Operations:
In addition to the previously mentioned Radiation Safety Program, there are many other radiation safety and health physics activities performed by the RSO. These are: communication with NRC,

communication with the VA National Health Physics Program, consultation with isotope users in Research regarding their radioisotope permits and specific problems in radiation safety and counting, and calibrations of some research counting equipment. The RSO performs radiation surveys in areas where X-ray producing equipment are located (Radiology, operating rooms, Cath Lab, etc.). The RSO also provides management of in-house radioisotope therapy cases. All these areas are under control.

C. Morale:

Morale of the RSO and all members of the Radiation Safety Committee continue to be high. The recent performance appraisal of the RSO showed outstanding levels of achievement in all areas. Radiation Safety is getting help from Nuclear Medicine regarding management of film badge personnel radiation monitors, from Environmental Management Service regarding radioactive waste collection, and from Engineering service regarding incineration.

D. Communications:

RSO is committed to continuously improving communications with Nuclear Medicine Service, Radiology, Cardiology, Research, Engineering, and other services within the Medical Center. He also is in continuous contacts with the Chief Medical Officer and with the Chairman and members of the Radiation Safety Committee regarding radiation safety issues. In addition, all forms of communications are well utilized toward improving communications with NRC regional office, VA radiation safety regional office, EPA regional office, University of Arizona radiation control office and VA central health physics office.

E. Technology:

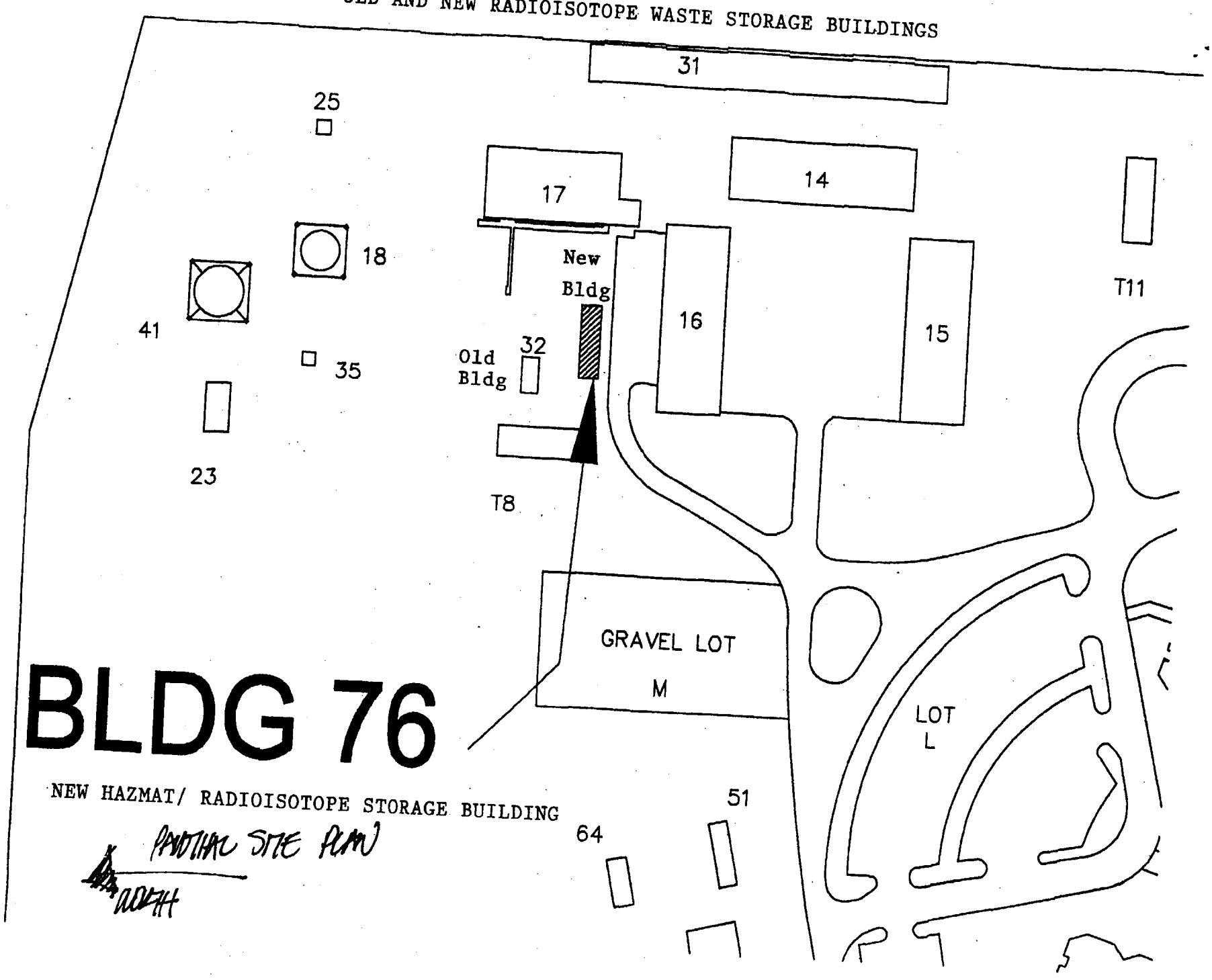
In the area of radiation dosimetry, the program is keeping an eye on the latest technological improvement. We are now equipped with up to date systems for monitoring external radiation dosimetry such as the digital radiation dosimeters for scattered radiations and the Diamentor M2 ionization chamber for measuring direct X-ray beams. The latest computer software in the area of internal radiation dosimetry (SAAM II and MIRDDOSE 3 software) are available to RSO. Computerized handling of data and information regarding radiation safety is our goal for accurate assessment and reporting.

F. Education and Training:

The RSO conducted in-services for all areas requiring safety education during 2004.

Fayez M. Swailem, Ph.D.
Medical Physicist/ Radiation Safety Officer

OLD AND NEW RADIOISOTOPE WASTE STORAGE BUILDINGS



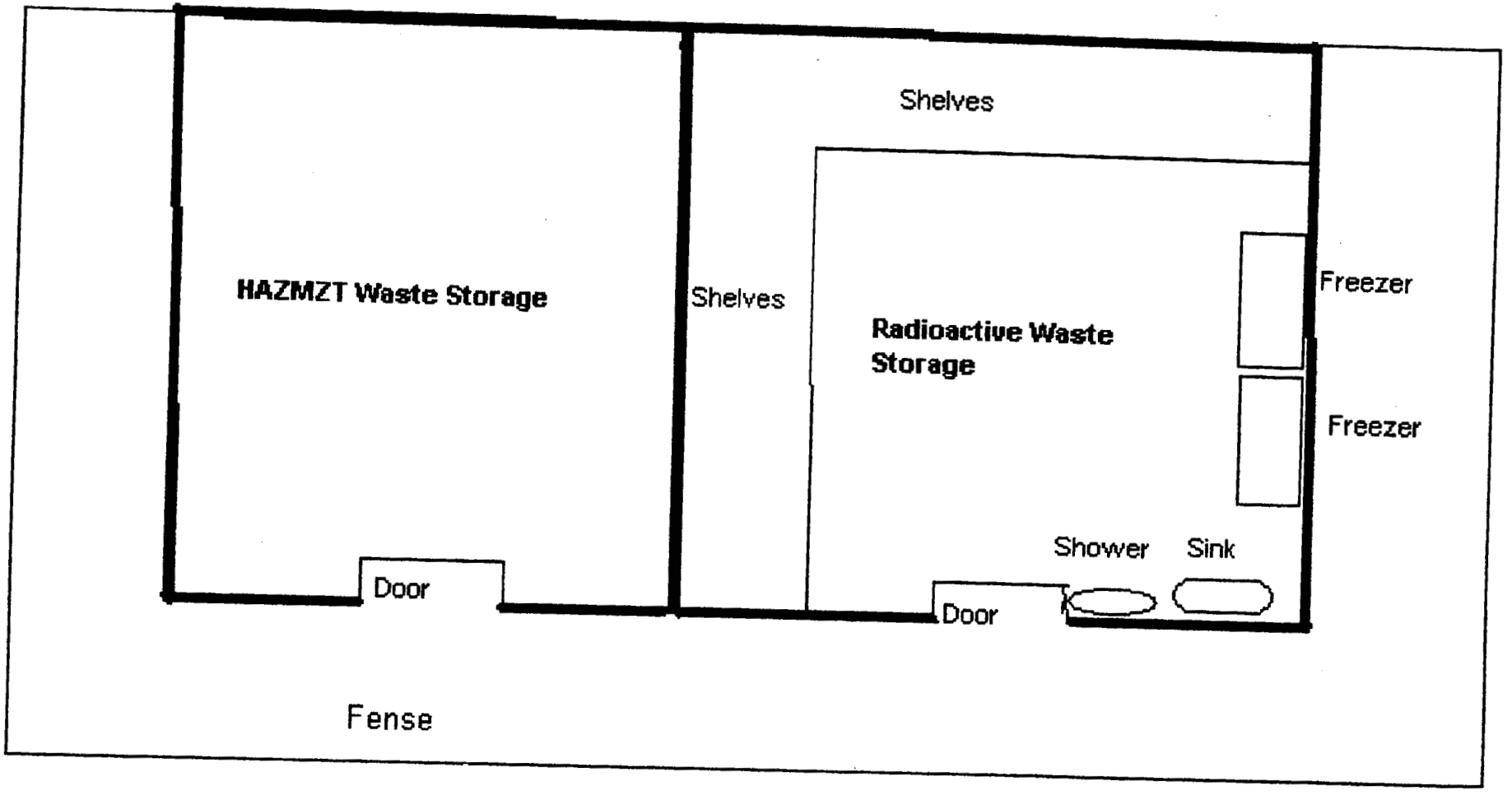
BLDG 76

NEW HAZMAT/ RADIOISOTOPE STORAGE BUILDING

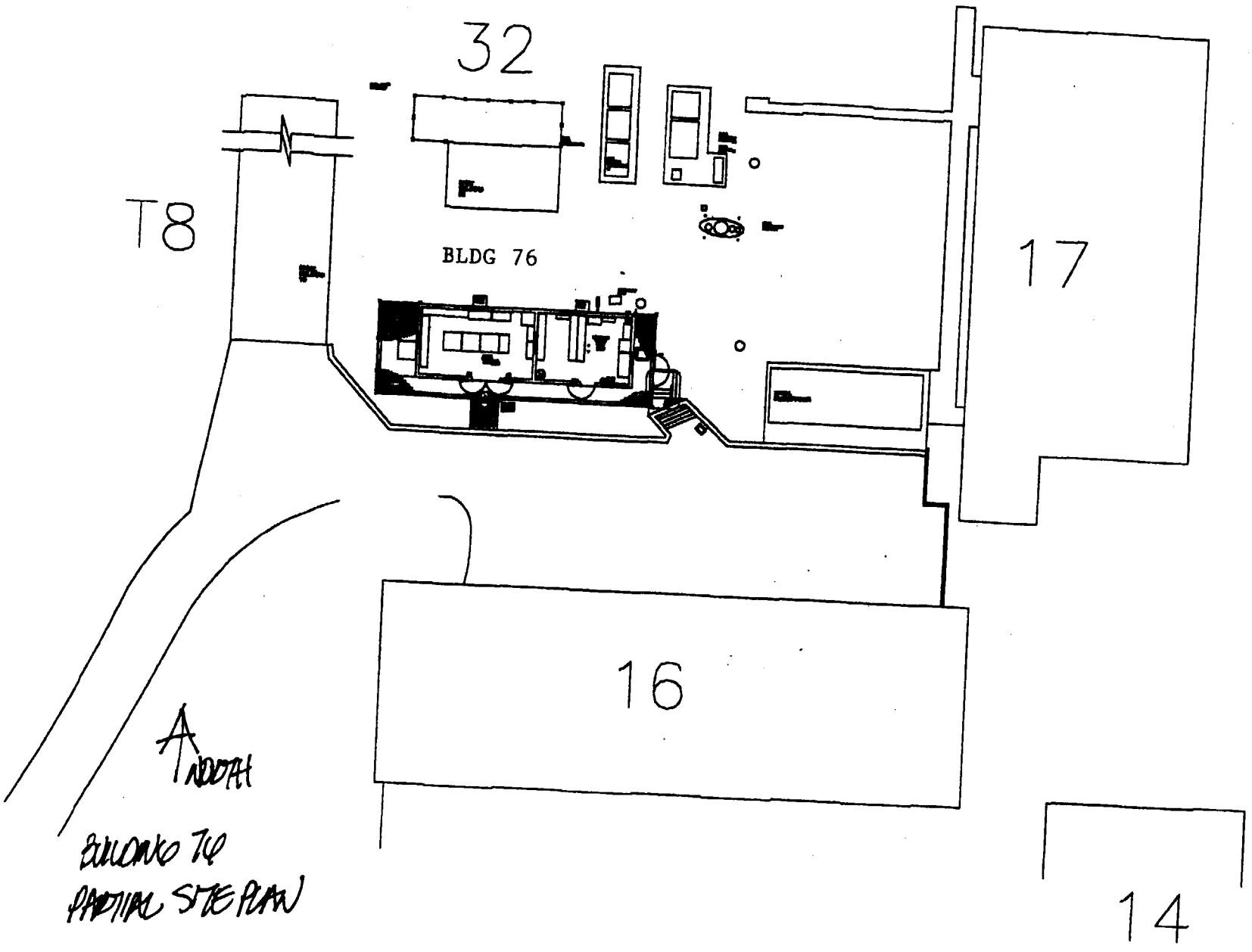
PARTIAL SITE PLAN

NORTH

HAZMAT/ Radioactive Waste Storage
Building 76



BLDG 76 - NEW HAZMAT/ RADIOISOTOPE STORAGE BUILDING



DEPARTMENT OF VETERANS AFFAIRS

Memorandum

Date: DEC 21 2006

From: Director, VHA National Health Physics Program (115HP/NLR)

Subj: Radiation Safety Program Inspection - Inspection Report 678-06-I01

To: Director (678/00), Southern Arizona VA Health Care System, Tucson, Arizona

1. Joseph Wissing, VHA National Health Physics Program, inspected the radiation safety program at the Southern Arizona VA Health Care System, Tucson, Arizona, on November 15, with continuing review through December 1, 2006. I accompanied Mr. Wissing during the inspection.

2. Attachment A to this memorandum is the inspection report. Attachment B is a Notice of Violation with one violation. The violation represents deviation from Nuclear Regulatory Commission requirements for use of radioactive materials.

3. You are required to respond to the Notice of Violation within 30 days of the date of this memorandum. You must follow the instructions in the Notice of Violation in preparing the response.

4. Thank you for the courtesy and cooperation extended during the inspection. Please contact Mr. Wissing at (734) 761-7906, if you have any questions about the inspection.

E. Lynn McGuire

Attachment

cc: Chair, National Radiation Safety Committee
Network Director, VISN 18 (10N18)

Attachment A

RADIATION SAFETY PROGRAM INSPECTION
Inspection Report Number 678-06-I01
Southern Arizona VA Health Care System, Tucson, Arizona
November 15 through December 1, 2006

1. **Introduction:**

The VHA National Health Physics Program (NHPP) inspected the radiation safety program at Southern Arizona VA Health Care System, Tucson, Arizona, on November 15, with continuing review through December 1, 2006. Joseph Wissing performed the inspection. Mr. Wissing presented preliminary findings at a meeting with key medical center staff on November 15, 2006. Lynn McGuire, Director, National Health Physics Program, accompanied Mr. Wissing during the inspection.

2. **Scope of inspection:**

The inspection followed a pre-approved inspection plan. The focus for the inspection was risk-informed and performance-based. The inspection consisted of an examination of the rooms and equipment of the Nuclear Medicine Service and research laboratories, review of radiation safety practices, review of selected records, and observations of and interviews with medical center staff. The inspector completed spot-check radiation measurements in the Nuclear Medicine Service hot laboratory, Nuclear Medicine preparation room, and in two research laboratories.

3. **Findings and impressions:**

a. The Nuclear Regulatory Commission (NRC) inspected the medical center on July 16-17, 2003. The NRC did not identify any violations. The NHPP did not identify any violations during the inspection on November 25, 2003.

b. Selected records and procedures in the following areas were reviewed with no violations cited:

(1) Radiation Safety Committee,

(2) Dosimetry,

(3) Package receipt,

(4) Source inventories,

(5) Area and contamination surveys, and

(6) Written directives.

c. The inspector noted that non-human use research activities have been inactive for an extended period of time (more than 1 year). The permittee committed to review the status of these authorized areas and close-out areas that do not have future plans to use radioactive materials. The permittee is considering closing out all non-human use research activities authorized by the permit.

d. The inspector reviewed the status of Building 32, a separate building authorized for the storage and disposal of radioactive materials. The RSO reported that they had closed out and decommissioned the building, and, that the building had been demolished on November 16, 2004. The inspector noted that the permittee under 10 CFR 30.34(c) and 10 CFR Parts 31 through 36 and 39 is required to confine possession and use of radioactive material to the locations and purposes authorized in the permit. Further, 10 CFR 35.13 requires that a permit amendment be obtained prior to adding to or changing the areas of use identified in the application or on the permit, except for areas of use where byproduct material is used only in accordance with either 10 CFR 35.100 or 10 CFR 35.200. The RSO reported that Building 32 was used for the storage and disposal of radioactive materials authorized for non-human use research and 10 CFR 35.100, 35.200, and 35.300. The inspector reviewed close-out surveys performed by the RSO in Building 32 and determined that all radioactive materials were removed and that remaining contamination of radioactive materials exceeding NUREG 1556, Volume 11, Table S.5, prior to demolition, did not likely exist. This is a violation of 10 CFR 30.34(c) and 10 CFR 35.13.

4. **Notice of Violation:**

a. The permittee failed to obtain a permit amendment closing out and decommissioning Building 32, an area used for storage and disposal of radioactive materials, prior to its demolition on November 16, 2004. (Attachment B).

Attachment B

Notice of Violation
Inspection Report Number 678-06-I01

Southern Arizona VA Health Care System
Tucson, Arizona **VHA Permit Number 02-06186-01**

1. Change in areas of use: 10 CFR 30.34(c) requires permittees in this part and parts 31 through 36 and 39 shall confine possession and use of the radioactive material to the locations and purposes authorized in the permit. Further, 10 CFR 35.13 requires that a permit amendment be obtained prior to adding to or changing the areas of use identified in the application or on the permit, except for areas of use where byproduct material is used only in accordance with either 10 CFR 35.100 or 10 CFR 35.200.

Violation: Contrary to the above, the permittee failed to obtain a permit amendment closing out and decommissioning Building 32, an area used for storage and disposal of radioactive materials, prior to its demolition on November 16, 2004.

This is a Severity Level IV violation.

Required action:

a. The medical center must take prompt action to correct the violation listed in this NOV and ensure the violation does not reoccur.

b. The medical center must submit a written statement to the NHPP within 30 days of the date of the memorandum transmitting this Notice of Violation. For each violation, the medical center response must describe the:

(1) Basic cause for the violation, or, if contested, the basis for disputing the violation or severity level.

(2) Corrective steps already taken.

(3) Corrective steps, which will be taken. Corrective actions shall including the submission of a permit amendment request closing out and decommissioning the waste storage building identified as Building 32. The request must contain all appropriate information in FAQ-02-03, the VA NHPP Closeout Questionnaire.

(4) Date full compliance will be achieved.

c. Where good cause is shown, the NHPP will consider extending the response time.

Group 3	Be-7 C-14 F-18 Na-24 Cl-38 Si-31 P-32 P-33 S-35 Ar-41 K-42 K-43 Ca-47 Sc-47 Sc-48 V-48 Cr-51 Mn-52 Mn-56 Fe-52 Fe-55 Fe-59 Co-57 Co-58 Ni-63 Ni-65 Cu-64 Zn-65 Zn-69m Ga-72 As-73 As-74 As-76 As-77 Se-75 Br-82 Kr-85m Kr-87 Rb-86 Sr-85 Sr-91 Y-90 Y-92 Y-93 Zr-97 Nb-93m Nb-95 Mo-99 Tc-96 Tc-97m Tc-97 Tc-99 Ru-97 Ru-103 Ru-105 Rh-105 Pd-103 Pd-109 Ag-105 Ag-111 Cd-109 Cd-115 In-115m Sn-113 Sn-125 Sb-122 Te-125m Te-127 Te-129 Te-131m Te-132 I-130 I-132 I-134 I-135 Xe-135 Cs-131 Cs-136 Ba-131 La-140 Ce-141 Ce-143 Pr-142 Pr-143 Nd-147 Nd-149 Pm-147 Pm-149 Sm-151 Sm-153 Eu-152 Eu-155 Gd-153 Gd-159 Dy-165 Dy-166 Ho-166 Er-169 Er-171 (9.2 hr) Tm-171, Yb-175 Lu-177 W-181 W-185 W-187 Re-183 Re-186 Re-188 Os-185 Os-191 Os-193 Ir-190 Ir-194 Pt-191 Pt-193 Pt-197 Au-196 Au-198 Au-199 Hg-197 Hg-197m Hg-203 Tl-200 Tl-201 Tl-202 Pb-203 Bi-206 Bi-212 Rn-220 Rn-222 Th-231 Pa-233 Np-239
Group 4	H-3 O-15 Ar-37 Co-58m Ni-59 Zn-69 Ge-71 Kr-85 Sr-85m Rb-87 Y-91m Zr-93 Nb-97 Tc-96m Tc-99m Rh-103m In-113m I-129 Xe-131m Xe-133 Cs-134m Cs-135 Sm-147 Re-187 Os-191m Pt-193m Pt-197m Th-232 Th-Nat U-235 U-238 U-Nat

Contamination in Unrestricted Areas

Contamination found in unrestricted areas should be immediately decontaminated to background levels. When it is not possible to get to background levels, the licensee must ensure that the amounts do not exceed the contamination levels listed in Table S.5.

Table S.5 Acceptable Surface Contamination Levels

Nuclide[1]	Average[2,3]	Maximum[2,4]	Removable[2,5]
I-125, I-129	1.7 Bq/100 cm^2 (100 dpm/100 cm^2)	5.0 Bq/100 cm^2 (300 dpm/100 cm^2)	0.3 Bq/100 cm^2 (20 dpm/100 cm^2)
I-126, I-131, I-133, Sr-90	16.7 Bq/100 cm^2 (1,000 dpm/100 cm^2)	50.0 Bq/100 cm^2 (3,000 dpm/100 cm^2)	3.3 Bq/100 cm^2 (200 dpm/100 cm^2)

Nuclide[1]	Average[2, 3]	Maximum[2, 4]	Removable[2, 5]
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	83.3 Bq/100 cm^2 (5,000 dpm/100 cm^2)	250 Bq/100 cm^2 (15,000 dpm /100 cm^2)	16.7 Bq/100 cm^2 (1,000 dpm/100 cm^2)

[1] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[2] As used in this table, dpm (disintegration per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[4] The maximum contamination level applies to an area of not more than 100 cm^2.

[5] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

When equipment or facilities that are potentially contaminated are to be released for unrestricted use, the above table provides the maximum acceptable residual levels. To the extent practicable, it is appropriate to decontaminate to below these levels. Surface contamination surveys should be conducted for both removable and fixed contamination before these facilities or equipment are released from restricted to unrestricted use, to ensure that they meet these limits.

A standardized method for smear testing of a relatively uniform area should be used to aid in comparing contamination at different times and places. A smear taken from an area of about 100 cm^2 is acceptable to indicate levels of removable contamination.

Survey Record Requirements

Each survey record should include the following:

- A diagram of the area surveyed
- A list of items and equipment surveyed
- Specific locations on the survey diagram where wipe test was taken
- Ambient radiation levels with appropriate units