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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 175

File:
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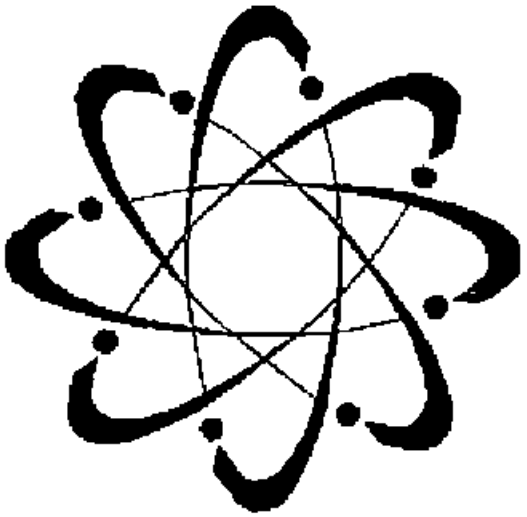
DEFENSE DISTRIBUTION REGION EAST

ENVIRONMENTAL BASELINE STUDY
RADIOLOGICAL SURVEY
FOR
DEFENSE DISTRIBUTION DEPOT MEMPHIS



DDRE RADIOLOGICAL HEALTH GROUP
SAFETY & OCCUPATIONAL HEALTH OFFICE

SURVEY CONDUCTED
AUGUST 5-9, 1996

File:
C.G. 212-700b

DEFENSE LOGISTICS AGENCY
ADMINISTRATIVE SUPPORT CENTER EAST
14 DEDICATION DRIVE, SUITE 3
NEW CUMBERLAND, PENNSYLVANIA 17070-5011

175 2

50

IN REPLY
REFER TO

ASCE-IW

AUG 15 1996

MEMORANDUM FOR DDMT-D
THROUGH: ASCE-I 8/15/96

SUBJECT: DDMT Radiological Survey

Two copies of the environmental baseline radiological survey report are forwarded for dissemination. Recommend placing one copy of the report in the archives for DDMT and a copy retained by DDMT.

We would like to commend Mr. Paul Blake, Radiation Protection Officer for DDMT for the invaluable assistance he rendered to the survey officer. He made significant contributions in the coordination, preparation and accumulation of data contained in this report.

This report recommends that the DDMT facilities where radioactive material was previously stored, be released for unrestricted use with the exception of Building 319, Bay 6. This building will require decontamination of the South wall and a thorough radiological survey of the entire bay area before we could recommend its release for unrestricted use.

POC for any additional information is Mr. Allen Hilsmeier, DSN 977-4762 or COM (717) 770-4762.

for JOHN STAMATELLOS
Regional Safety & Occupational Health Manager
ASCE-IW

Attachment:

cc:
DDRE-D/DD
CAAEH
ASCE-D
ASCE-WP

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This document encompasses a historical search, the sampling protocol to conduct an environmental baseline radiological survey and the survey results for the Defense Distribution Depot Memphis, Tennessee (DDMT). The historical search involved discussions with key persons who were directly knowledgeable of the past radiological operations at DDMT. The radiological survey protocol was developed utilizing the guidance contained in various references that are listed in Appendix A. Also utilized were good health physics practices, and protocols developed by the Department of the Army during previous base closures. The survey results indicate that not all facilities that stored radioactive material can be released for unrestricted use at this time. Remediation of low level contamination in Building 319 must be accomplished before that facility can be released for unrestricted use.

The historical review of radiological activities at DDMT revealed that lantern mantles that contain naturally occurring radioactive thorium were the primary items in storage. Discussion with current and former radiation protection officers and employees did not indicate any evidence of breakage or contamination of any facilities surfaces or the environment. However, this survey identified the South interior wall of Building 319 as having alpha contamination present that was slightly above the release criteria for unrestricted use.

The three other buildings identified by previous and current employees at DDMT were found to be free of any residual contamination. The employees collectively stated that the bulk of the radioactive material was stored over the years in a conex container alongside Building 319. An attempt to locate the conex container was unsuccessful.

BACKGROUND

DDMT was targeted for closure during a Base Realignment and Closure (BRAC) action. DDMT must remove all radioactive material currently in storage and ensure that facilities where radioactive material was stored can be released for unrestricted use.

The radioactive material (RAM) at DDMT was transferred to other DDRE depots. Further, action is underway to direct line item managers to no longer ship their radioactive commodities to DDMT. Any RAM forwarded to DDMT in the future will be regarded as a transshipment and immediately redirected to another Defense Logistics Agency (DLA) depot. They will perform no processing or repackaging of the RAM received.

The primary RAM stored at DDMT were lantern mantles that contain naturally occurring Thorium-232 (Th-232). The lantern mantles are exempt from licensing and control by the Nuclear Regulatory Commission (NRC) because of their low level of radioactivity.

Other radioactive commodities identified as having been stored at DDMT are:

1. Smoke detectors containing generally licensed amounts of americium 241(Am-241).
2. Electron tubes containing non-licensed amounts of Th-232, tritium (H-3), and radium-226 (Ra-226).
3. Wrist watches containing generally licensed amounts of H-3 and Ra-226.

4. Indicator and toggle switches containing Ra-226.
5. Compasses containing H-3.

No maintenance work took place at DDMT that may have involved the removal of radioactive material from the commodities and no repackaging or unwrapping of RAM occurred. Based upon this background information, DDRE determined that all areas identified as having stored radioactive commodities will be classified as unaffected areas as described in reference 1, Appendix A.

SITE DESCRIPTION

DDMT was first activated as the Memphis General Depot in January 1942 under the U.S. Army. It became a DLA depot in January 1964. It was a primary distribution site for clothing and textiles. It is located in the extreme Southwestern corner of Tennessee in the southern part of the city of Memphis. DDMT occupies 630 acres with 6 million square feet of covered storage.

The four buildings located at DDMT that stored RAM consists of a concrete floor and concrete precast or reinforced concrete walls. Two of the buildings, i.e., Buildings 319 and 629, had an epoxy material covering the floors. The epoxy was probably added after the RAM was no longer stored in the buildings to accommodate other hazardous substances such as corrosives. A radiological survey of the floor for these two buildings would not detect any alpha or beta contamination.

HISTORICAL REVIEW

The historical review of DDMT operations involving RAM indicated that NRC generally licensed and license exempt radioactive sources were stored at the Depot. Interviews were conducted on August 6-7, 1996, with Mr. Woodward Thomas, Radiation Protection Officer (RPO), from 1975 to 1983; Mr. Paul Blake, RPO from 1995 to the present; Mr. Harry Hartwig, Physical Scientist, from 1985 to the present; Mr. William Lovejoy, Chief, Recyclable Materials Branch, from 1981 to 1984 and 1986 to 1987; and Mr. Skip Wallace, Chief, Fire Inspection, from 1982 to the present. In addition, interviews were conducted with Mr. John Tibbels, RPO from 1983 to 1989; Mr. David Luscavage, RPO from 1989 to 1993; and Mr. Charles Crouch, Safety & Occupational Health Manager, from 1979 to 1987.

The interviewees stated that the RAM was primarily stored in a conex container near Building 319 and that no disassembly of items occurred to, in, or from the conex container. The conex container was removed long ago and could not be located. The surface below the conex container had been resurfaced with asphalt. Although the interviewees stated that they could not remember any incidents involving RAM, they had not conducted a radiation survey to verify their statement.

Interviewees stated that radiation surveys had not been conducted in the past because they did not have the necessary equipment. Also, the items were all generally licensed and license exempt which did not require any radiation surveys in accordance with NRC regulations.

At the time of this survey, the storage cage in Building 359 housed about 4000 watches that contained tritium. The watches were removed from the cage immediately and shipped to another DLA depot.

TRAINING

The persons performing this survey were trained on the use of the instrumentation and the procedures to follow during the survey prior to beginning work. The DDRE Health Physicist was responsible overall for the accuracy and adequacy of the data. He was assisted by the DDRE alternate Radiation Safety Officer and the current DDMT RPO.

SURVEY PROCEDURES

OVERVIEW

The facilities identified as having stored radioactive commodities were treated as unaffected areas as defined in NUREG-5849. Each location was considered a separate survey unit. Walls were monitored only if they were in contact with the RAM.

Regarding Building 319, Bay 6, it was used to primarily store lantern mantles but watches, electron tubes, smoke detectors and toggle switches were also stored in the facility. The interviewees indicated that the RAM was mainly stored in the Southeast corner. One interviewee stated, however, that lantern mantles at one time was stored throughout the bay area. The East wall was believed to be installed sometime after RAM was already being stored. Furthermore, there was evidence that a wall was originally installed between Bays 6 and 7 but is now removed. Epoxy material was applied over the floor at some time after the RAM was present and probably after the RAM had been removed from the facility. Even though the area was categorized as an "unaffected area," one square meter grids were drawn on the floor and 2 meters up the wall at the Southeast corner to accurately measure any residual contamination. If no contamination was detected, ten square meter grids or less would be used for the remaining area in Bay 6.

Regarding Building 629, Bay 2, it served as an overflow facility when the conex container or Building 319 was full. The RAM was stored on pallets at least 5 meters from the nearest wall. Epoxy material was applied over the floor at some time after the RAM was present and probably after the RAM had been removed from the facility. The interviewee who remembered that RAM was stored in Building 629 also stated that only lantern mantles were stored there. The surface area was sectioned off in 3 meter grids and monitored for beta and gamma contamination even though it is recognized that the beta radiation would probably not penetrate the epoxy material.

Regarding Building 835, Section 6, a small room was used at one time to store small amounts of radioactive commodities. It was not used regularly and only the East side of the room was needed. Nevertheless, the entire room was monitored for residual alpha, beta, and gamma contamination.

Regarding Building 359, Section 3, the security vault and wire cage were used to store pilferable items such as watches and compasses. These radioactive commodities contained tritium. Reference 6 was a special survey of the vault to detect the presence of any tritium contamination.

The survey was performed in May 1988 by the U.S. Army Environmental Hygiene Agency. Survey results indicated tritium contamination exceeding the release limit, i.e., 5000 DPM/ 100 cm^2 on the outside of storage boxes but the floor, pallets and tables were well below the release limits. The items were removed and shipped to another depot. At the time of this survey, watches containing tritium were stored in the wire cage only and these items were removed before the conclusion of the survey.

Several interviewees indicated that watches containing RAM were stored in Building 360 at one time. This building has since been torn down. Sampling of the ground surface below and around the former facility was not considered necessary because of the unlikeliness of finding contamination.

Stationary measurements were taken in the facilities using a "box and X" pattern, i.e., 5 measurements were taken in each grid "box." Measurements were taken in each grid corner and in the center of the grid. A scan was also made over the surface of the grid as recommended in reference 1, Appendix A.

Alpha radiation measurements were conducted by using the audio response of a survey meter and counting the total number of clicks over a 30 second time period. This technique was used to reduce the Minimum Detectable Activity (MDA) to as low as possible and yet provide a reasonable time frame to collect the data. The surface was also scanned at a rate of about one detector width per second, i.e., 4 inches per second.

Beta radiation measurements were conducted by reading the meter of the survey meter. The size of the detector, i.e., 100 cm^2, precluded taking an integrated count because of the relatively high background. The large detector provided, however, the optimum MDA. A scan was also made of the surface at the rate of about 4 inches per second.

Gamma radiation measurements were conducted by reading the meter of the survey meter. Readings were taken on contact with the surface and at one meter. A scan was also made of floor and wall surfaces and on stationary equipment such as shelves, conveyors, etc. Particular attention was given to cracks in surfaces. The audio was used to determine if any elevated contamination levels were present.

The guideline values specified in reference 3, Appendix A, could be observed using the instrumentation described below. The instruments used to measure alpha, beta and gamma radiation had MDAs of 70 DPM/ 100 cm^2, 1,900 DPM/ 100 cm^2, and 1 uR/hr, respectively.

At least one wipe test was taken within each grid. For small rooms, numerous wipe tests were taken to provide statistically meaningful results. Random wipe tests were taken on shelves where RAM was previously stored.

INSTRUMENTATION

Instrumentation used for the surveys included a zinc sulfide scintillator for alpha detection, a plastic scintillator for beta detection and a sodium iodide crystal for gamma detection. Each instrument underwent standard quality assurance checks such as a daily source check, background and efficiency determinations, establishment of a MDA and a flag value. Instruments were calibrated by a certified U.S. Army calibration facility on a six month basis.

Specific information on the types of instruments used are:

I. Fixed Contamination:

a. Alpha Radiation
Ludlum Survey Meter, Model 2224, Serial Number 125598
Ludlum Detector, Model 43-89, Serial Number 134011
Calibration Date July 29, 1996
Background at site
Floor 6 DPM/ 100 cm^2, (1.0 CPM)
Wall 16 DPM/ 100 cm^2, (2.8 CPM)
Efficiency 18 % for Th-230
Detector surface area 100 cm^2
MDA 70 DPM/ 100 cm^2
Flag Value 75 DPM/ 100 cm^2, (13 CPM)

b. Beta Radiation
Ludlum Survey Meter, Model 2224, Serial Number 125598
Ludlum Detector, Model 43-89, Serial Number 134011
Calibration Date July 29,1996
Background at site
Floor 3,040 DPM/ 100 cm^2 (350 CPM)
Wall 4,870 DPM/ 100 cm^2 (560 CPM)
Efficiency 11.5 % for Tc-99
Detector surface area 100 cm^2
MDA 1,900 DPM/ 100 cm^2
Flag Value 3,750 DPM/ 100 cm^2, (430 CPM)

c. Gamma Radiation
Ludlum Survey Meter, Model 19, Serial Number 104568
Ludlum Detector, Model 19, Internal Mounted
Calibration Date July 23, 1996
Background 6 uR/hr
MDA about 1 uR/hr static measurement*
MDA about 3 uR/hr scanning monitoring*

* Defined in Appendix A, reference 1, Table 5-6.

II. Removable Contamination

a. Alpha/Beta Radiation
Tennelec Model LB-5100 Serial Number 7040614
Proportional Counter
Calibration Date August 5, 1996
Background
Alpha 3.0 DPM/ 100 cm^2 (0.74 CPM)
Beta 6.1 DPM/ 100 cm^2 (2.73 CPM)
Efficiency
Alpha 24.9%
Beta 44.7%
MDA
Alpha 2.7 DPM/ 100 cm^2

Beta 2.7 DPM/ 100 cm^2

b. Tritium

Beckman Model 6500, Serial Number 7067417
Liquid Scintillation Counter
Calibration Date August 12, 1996
Background 20 DPM/ 100 cm^2
Efficiency 67 %
MDA 10 DPM/ 100 cm^2

QUALITY ASSURANCE CHECK

A daily check for portable survey instruments consisted of a source check and comparison of the measurement to a reading determined after calibration. Measurements conducted before and at the end of the day's survey were within ± 20% of the initial value. Additionally, the physical condition of the instrument, to include battery, cables and probes were checked. A daily background check was performed.

The laboratory instrument's efficiency value and MDA were determined using National Institute of Standards and Technology traceable standards. The standards were measured just prior to the wipe tests being counted.

SURVEY TECHNIQUES

Stationary surveys for alpha radiation were performed by holding the probe in contact with the surface surveyed for at least a 30 second count time. The count time was reasonable and ensured that the MDA value was below the guideline values. For example, the guideline values for Ra-226 for fixed contamination are 100 DPM/ 100 cm^2 and 324 DPM/ 100 cm^2, per references 4 and 2, Appendix A, respectively. The guideline values for Th-232 for fixed contamination are 1,000 DPM/ 100 cm^2 and 114 DPM/ 100 cm^2, per references 4 and 2, Appendix A, respectively. In both cases, the alpha radiation MDA, 70 DPM/ 100 cm^2 is less than the regulatory guideline values.

Stationary surveys for beta radiation were performed by holding the probe in contact with the surface surveyed for at least 8 seconds. This amount of time encompassed two time constants of the instrument and ensured that the reading had stabilized. The MDA, 1,900 DPM/ 100 cm^2, is below the guideline value for beta emitting radioisotopes, i.e., 5,000 DPM/ 100 cm^2, as stated in reference 4, Appendix A.

Stationary surveys for gamma radiation were performed by holding the survey meter in contact with the surface for about 8 seconds. This amount of time ensured that the meter had stabilized. The MDA, 1 uR/hr, is below the guideline value for gamma emitting radioisotopes, i.e., 5 uR/hr as stated in the Acceptance Criteria section below. A stationary survey was also made with a gamma meter on shelves where RAM was stored.

Scanning surveys were made for alpha and beta contamination by moving the probe less than 1 cm from the surface. Scanning surveys for gamma radiation was performed by walking slowly through the area obtaining exposure rate readings on surfaces. Scans were also made on shelves and nearby walls where RAM was stored. The highest reading obtained at a survey point was recorded. If any areas exhibited readings greater than the flag value, they would be subjected to stationary surveys on contact with the surface, and a wipe test conducted.

Survey of the walls was performed if the RAM was in contact with the surface.

BACKGROUND DETERMINATION

Background determinations for gamma dose rate and alpha, beta count rate surveys were made prior to the beginning of the survey. Measurements were made in Building 319 in an adjoining room where RAM had never been stored but of similar construction as the facilities to be surveyed. Twenty measurements were made using alpha, beta and gamma survey meters. The average readings were shown in the Instrumentation section above. The variance of the measurements was such that the beta and gamma readings were within the 95 % confidence level.

The alpha measurements ranged from 0 to 3 CPM in a 30 second time period. This spread, although small in actual size, would nevertheless require over 180 measurements to be taken to establish a statistically accurate average background. This number of background readings is unrealistic to obtain and not considered necessary due to the background reading being a factor of ten below the guideline value for measuring alpha radiation in the storage locations. The background was verified each day the survey occurred.

Background readings were made prior to use of laboratory equipment. These measurements were used to determine the MDA for the several isotopes.

WIPE TESTS

Because of the nature of the RAM stored at DDMT, the possibility of finding loose contamination was small. Nevertheless, wipe tests of the facilities were taken to determine if any residual contamination was present. About 30 wipe tests were taken on the floor and shelves at each storage location. Each alpha/beta-gamma wipe test was conducted by taking a 1.75 inch diameter filter paper and wiping a 10 inch surface in an 'S' pattern. This test resulted in an area wiped of about 100 cm^2. These wipe tests were counted in a scaler capable of measuring both alpha and medium energy beta radiation.

A wet wipe test was also conducted using a 1 inch square filter paper and wiping a 16 inch surface in an 'S' pattern. The filter paper was dissoluble in a liquid scintillation counter medium. These wipe tests were counted in a liquid scintillation counter to measure any low energy beta emitting radioisotope such as tritium.

ACCEPTANCE CRITERIA

Residual contamination is considered a low probability based upon the kinds and types of radioactive commodities previously located at DDMT. Nevertheless, DDRE believes it prudent to perform reasonable surveys to support this premise. The current standards for unrestricted use are contained in Appendix A, references 1 through 4. These standards formed the basis for the acceptance criteria used by DDRE in the evaluation of DDMT.

The primary acceptance criteria are detailed in the table below:

Table 1: Acceptance Criteria

Radionuclide	Exposure Rate (mRem/Hr) [3]	Ave. Gross Contamination [1]	Max. Gross Contamination [2]	Removable [1]
U-nat, U-235, u-238, and associated decay products	N/A	5,000 DPM α/100 cm^2	15,000 DPM α/100 cm^2	1,000 DPM α/100 cm^2
Transuranic, Ra-226, Ra-228, Th-230, Pa-231, Ac-227, I-125, I-129	N/A	100 DPM/100 cm^2	300 DPM/100 cm^2	20 DPM/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	N/A	1,000 DPM/100 cm^2	3000 DPM/100 cm^2	200 DPM/100 cm^2
Beta-gamma emitters except Sr-90 and other noted above	0.005 mrem/hr	5,000 DPM/100 cm^2	15,000 DPM/100 cm^2	1,000 DPM/100 cm^2

[1] As used in this table, DPM (disintegrations 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.

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

[3] The exposure rate criteria of 0.005 mrem/hr (5.0 µR/hr) was obtained from a Nuclear Regulatory Commission internal memo dated October 29, 1986, from S. Block, Health Physicist, Region V to Peter Erickson, Special and Standardization Project, NRR, subject: Conversion of Regulatory Guide 1.86 Surface Contamination Limits Into Exposure Rate For Release For Unrestricted Use.

A secondary acceptance criteria is outlined in reference 2, Appendix A. These values are as follows for a projected Total Effective Dose Equivalent of 3 millirem per year from fixed and removable surface contamination for a building occupancy (Table B-1).

H-3	5.29E6 DPM/ 100 cm^2
Th-232	1.14E2 DPM/ 100 cm^2
Ra-226	1.91E2 DPM/ 100 cm^2
Am-241	3.71E1 DPM/ 100 cm^2

SURVEY DATA ANALYSIS

Data obtained for the four locations are provided in Appendix C. The data were compared to both primary and secondary acceptance criteria.

Regarding the direct measurement for alpha contamination in Bay 6 of Building 319, three wall grids had an average net value that slightly exceeded the guideline values for all alpha emitting radioisotopes that were previously stored at DDMT. Repeat readings were taken at two of the grids and in general, the readings were in agreement. One of the repeat readings at grid W8, i.e., 328 net DPM/ 100 cm^2, slightly exceeded the maximum allowable contamination level specified in reference 4, Appendix A. If either of these conditions occur during the course of the survey, the area must be reclassified from an "unaffected" to an "affected" area. The testing requirements become more rigorous as defined in reference 1, Appendix A. The direct measurement for alpha contamination in the other facilities were all below the regulatory requirements.

Regarding the direct measurement for beta contamination in the facilities, all the readings were within the statistical fluctuations of background radiation. The data indicate that no significant, if any, fixed contamination was present from beta emitting radioisotopes.

Regarding the direct measurement for gamma contamination in the facilities, the highest net value at any location was 1 uR/hr. The data indicate that no significant, if any, fixed contamination was present that emits gamma radiation.

Regarding the removable alpha/beta-gamma contamination measurements in all the facilities, all readings were below the primary acceptance criteria for Ra-226, i.e., 20 DPM/ 100 cm^2. Radium-226 has the most stringent acceptance criteria. The data indicate that no significant removable contamination was present.

Regarding the removable tritium contamination measurements in the facilities and especially in Building 359 where the bulk of the items containing tritium was stored, all measurements were well below the primary and secondary acceptance criteria for tritium, i.e., 1,000 DPM/ 100 cm^2, and 5.29E6 DPM/ 100 cm^2, respectively.

CONCLUSION

The data indicate that one of the DDMT facilities where RAM was stored in the past, i.e., Building 319, Bay 6, was slightly contaminated above allowable limits for fixed alpha radiation. In its present condition, it could not be released for unrestricted use. The facility does not present a health hazard because of the low level of contamination present which is not readily removable. The other facilities were all well within the limits and could be released for unrestricted use.

RECOMMENDATION

It is recommended that: 1) Building 319, Bay 6, be restricted to limited access and controlled by the DDMT RPO until it can be decontaminated; 2) that the entire area undergo a termination survey as an "affected" area in accordance with reference 1, Appendix A; 3) The epoxied floor in Building 319, Bay 6, be scraped sufficiently to allow alpha measurements to be taken to determine

if residual contamination is on the floor; and 4) The other facilities at DDMT where RAM was previously stored be released for unrestricted use.

Submitted by:

Allen E. Hilsmeier

ALLEN E. HILSMEIER
DDRE Health Physicist

Approved by:

J. O. RIMEL, Sr
Director
Public Safety Office

APPENDIX A

REFERENCES

1. NUREG/CR - 5849, Manual for Conducting Radiological Surveys in Support of License Termination, June 1992 (Draft).

2. NUREG - 1500, Working Draft Regulatory Guide on Release Criteria for Decommissioning: NRC Staff's Draft for Comment, August 1994.

3. NRC Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, June 1974.

4. NRC Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Materials, USNRC, August 1987.

5. Draft Radioactive Commodity Radiation Survey Protocol, Department of the Army, January 3, 1996.

6. Report, Radiation Protection Study No. 27-43-0163-89,.....Defense Depot Memphis, Tennessee, 9-10 May 1988, U.S. Army Environmental Hygiene Agency, 27 February 1989.

APPENDIX B

ABBREVIATIONS

Am-241	Americium-241
BRAC	Base Realignment and Closure
cm^2	square centimeters
CPM	counts per minute
DDMT	Defense Distribution Depot Memphis, Tennessee
DDRE	Defense Distribution Region East
DLA	Defense Logistics Agency
DPM	disintegrations per minute
DPM/ 100 cm^2	disintegrations per minute per 100 square centimeters
H-3	tritium
MDA	Minimum Detectable Activity
mrem/hr	millirem per hour
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory Commission Regulation
Ra-226	Radium-226
RAM	radioactive material
RPO	Radiation Protection Officer
Th-232	Thorium-232
uR/hr	microroentgens per hour

APPENDIX C

SURVEY RESULTS

BUILDING 319, BAY 6

DEFENSE DISTRIBUTION DEPOT MEMPHIS, TENNESSEE

	DIRECT MEASUREMENT													REMOVABLE				
Loc	Gross					Gross					Gross			Gross				
	Alpha					Beta					Gamma			Alp	Bet	H-3	Alp/Bet	H-3
											Sc	St	1M	DPM/100cm²			ID	ID
F1	0	11	11	0	22	2440	2610	2610	3650	2780	6	6	5	3.8	6.5	108	1	T1
F2	11	22	11	22	11	3130	3300	3300	3480	3480	5	5	5	3.0	6.5		2	
F3	33	11	0	22	33	3480	3130	2610	3300	3480	6	6	6	2.0	7.5		3	
F4	22	0	11	22	11	3480	3130	2610	3480	2780	5	5	5	2.0	6.9		4	
F5	11	0	22	44	33	2610	2780	3300	3480	3480	6	6	6	2.6	4.7		5	
F6	11	22	11	11	22	2610	2960	2610	3480	3480	6	6	6	7.9	5.9	83	6	T2
F7	11	44	22	0	44	2780	2960	3300	2610	3480	6	6	6	3.0	6.0		7	
F8	33	11	22	33	22	3480	2610	3300	3300	3130	6	6	6	3.5	6.6		8	
F9	11	11	33	22	44	3130	3130	3300	3130	3830	5	5	6	2.7	6.5		9	
W1						2130	2400	1870	2000	1600	5	5	5	2.7	5.7	93	11	T3
W2						2000	2000	1870	2270	2270	6	5	5	2.7	6.1		12	
W3						2130	2270	2270	2130	2270	5	5	6	1.6	6.4		13	
W4						2130	2000	2400	2270	2270	6	6	6	2.2	5.1		14	

W5						2530	2270	2130	2270	2130	5	5	5	2.7	5.6		15	
W6	33	0	22	0	11	2000	2130	2270	2130	2130	5	5	5	3.4	6.3	93	16	T4
W7						2270	2400	2400	2400	2130	5	5	5	2.4	6.3		17	
W8	111	67	122	56	200	2670	2530	2530	2530	2400	4	5	5	3.1	6.6		18	
	67	100	122	156	44									5.0	13.0		S1	
	111	67	344	56	200									3.5	12.0		S2	
W9						2270	2400	2530	2270	2130	5	5	5	3.3	6.3		19	
W10	100	100	244	122	144	2400	2670	2670	2670	2400	6	5	6	4.3	9.7		20	
	122	144	133	122	122									6.5	11.1		S3	
	156	111	189	167	89									4.6	9.8		S4	
	100	100	244	122	144									4.2	10.0		S5	
W11						2400	2530	2400	2670	2530	5	5	5	4.5	10.3		21	
W12						2270	2400	2530	2400	2400	6	5	6	4.0	10.3	67	22	T5
W13						2130	2130	2000	2000	2000	5	5	6	2.0	6.6		23	
W14	144	78	133	133	122													
W15	11	11	0	11	0													
W16	22	11	11	11	11													
W17	11	0	11	11	0													
W18	44	11	56	33	33													
C1	11	22	0	11	11									2.7	6.3		S6	

C2														2.0	6.0		24	
C3														2.4	6.1		25	
C4														3.1	6.0		26	
C5														3.0	7.1		27	
C6														1.6	2.6		28	
C7														3.2	8.6		29	
C8														1.5	6.9		30	

Direct Measurement
Background - Alpha Floor 6 DPM/100cm²
Wall 16 DPM/100cm²

Removable
Alpha 3 DPM/100cm²
Beta 6 DPM/100cm²

Beta 3000 DPM/100cm²

Gamma 6 uR/hr

Abbreviations: Loc - Location Alp - Alpha Bet - Beta
Sc - Scan St - Stationary
C - Random Wipe Tests

BUILDING 835, SECTION 6, SMALL ROOM

DEFENSE DISTRIBUTION DEPOT MEMPHIS, TENNESSEE

	DIRECT MEASUREMENT													REMOVABLE		
Loc	Gross					Gross					Gross			Gross		
	Alpha					Beta					Gamma			Alp	Bet	Wipe
	DPM/100cm²					DPM/100cm²					uR/hr					Test
											Sc	St	1M			
F1	0	0	0	0	0	2000	2130	2130	2070	2130	6	6	6	4.9	7.5	1
														2.7	7.8	2
														2.7	7.5	3
														3.1	5.7	10
														3.5	5.8	11
														2.7	5.8	12
														2.3	6.1	13
														3.1	5.4	14
														2.4	6.0	15
F2	11	0	0	0	0	2200	2070	2130	2130	2070	6	6	6	3.5	7.0	4
														3.2	7.4	5
														2.2	6.9	6
														3.8	6.9	7
														2.6	5.8	8
														2.6	6.5	9
														2.4	5.5	16
														2.0	6.6	17
														2.6	7.1	18

	0	0	0	0	0	2130	2130	2070	2000	2000	7	7	7	2.2	6.3	22
														2.6	6.8	23
														3.4	5.4	24
														2.2	6.3	25
														2.0	6.0	26
														3.5	6.5	27
F4	0	0	11	11	0	2130	2000	2200	2070	2130	7	7	7	2.6	5.3	19
														2.1	6.3	20
														2.8	4.8	21
														2.7	5.4	28
														2.4	6.1	29
														2.2	6.6	30

Direct Measurement
Background - Alpha Floor 6 DPM/100cm²
Wall 16 DPM/100cm²

Beta 3000 DPM/100cm²

Gamma 6 uR/hr

Removable
Alpha 3 DPM/100cm²
Beta 6 DPM/100cm²

Abbreviations: Loc - Location Alp - Alpha Bet - Beta
Sc - Scan St - Stationary

BUILDING 629, BAY 2

DEFENSE DISTRIBUTION DEPOT MEMPHIS, TENNESSEE

DIRECT MEASUREMENT									REMOVABLE		
Loc	Gross					Gross			Gross		
	Beta					Gamma			Alp	Bet	ID
						Sc	St	IM			
F1	2130	2000	2130	2270	2270	5	5	5	2.3	6.6	31
									2.4	6.6	32
F2	2270	2130	2000	2270	2070	5	5	5	2.0	6.3	45
									2.3	6.3	46
F3	2000	2200	2270	2130	2000	5	5	5	2.0	5.1	47
									2.3	5.7	48
									2.6	6.1	57
F4	2000	2130	2270	2130	2000	5	5	5	3.4	5.7	49
									2.7	5.2	50
									2.4	5.1	56
F5	2200	2000	2130	2070	2130	5	5	5	2.8	5.4	43
									2.9	6.9	44
F6	2130	2130	2270	2070	2130	5	5	5	2.6	7.3	33
									3.5	5.2	34
F7	2130	2130	2000	2070	2200	5	5	5	2.3	5.8	35
									2.0	5.8	36
F8	2000	2000	2130	2130	2130	5	5	5	1.8	5.0	41
									2.2	5.7	42

F9	2000	2070	2200	2130	2070	5	5	5	2.8	6.8	51
									3.2	5.1	52
									2.6	7.0	55
F10	2070	2000	2200	2000	2000	5	5	5	3.6	6.3	53
									2.6	5.7	54
F11	2070	2200	2000	2000	2130	5	5	5	2.3	6.2	39
									3.0	6.3	40
F12	2270	2130	2200	2130	2070	5	5	5	2.6	6.4	37
									1.5	5.5	38

Direct Measurement
Background - Beta 2130 DPM/100cm²
Gamma 6 uR/hr

Removable
Alpha 3 DPM/100cm²
Beta 6 DPM/100cm²

Abbreviations: Loc - Location Alp - Alpha Bet - Beta
Sc - Scan St - Stationary

BUILDING 359, SECTION 3

DEFENSE DISTRIBUTION DEPOT MEMPHIS, TENNESSEE

		REMOVABLE			REMOVABLE
	Location	H-3		Location	H-3
	ID	DPM/100cm^2		ID	DPM/100cm^2
Wire Cage			Vault		
	H1	68		V21	52
	H2	77		V22	57
	H3	61		V22R	22
	H3R	23		V23	44
	H4	61		V24	58
	H5	59		V24R	21
	H6	72		V25	54
	H7	73		V26	47
	H8	76		V26R	18
	H9	69		V27	42
	H10	74		V28	50
	H11	55		V29	47
	H12	74		V30	43
	H13	85		V31	48
	H14	70		V32	51
	H15	61		V33	58
	H16	53		V34	49
	H16R	21		V35	50
	H17	52		V36	45
	H18	51		V37	49

	H19	51		V38	49
	H20	113		V39	44
				V40	50
				V41	56
				V42	57
				V43	44
				V44	49
				V45	52
				V46	46

APPENDIX D

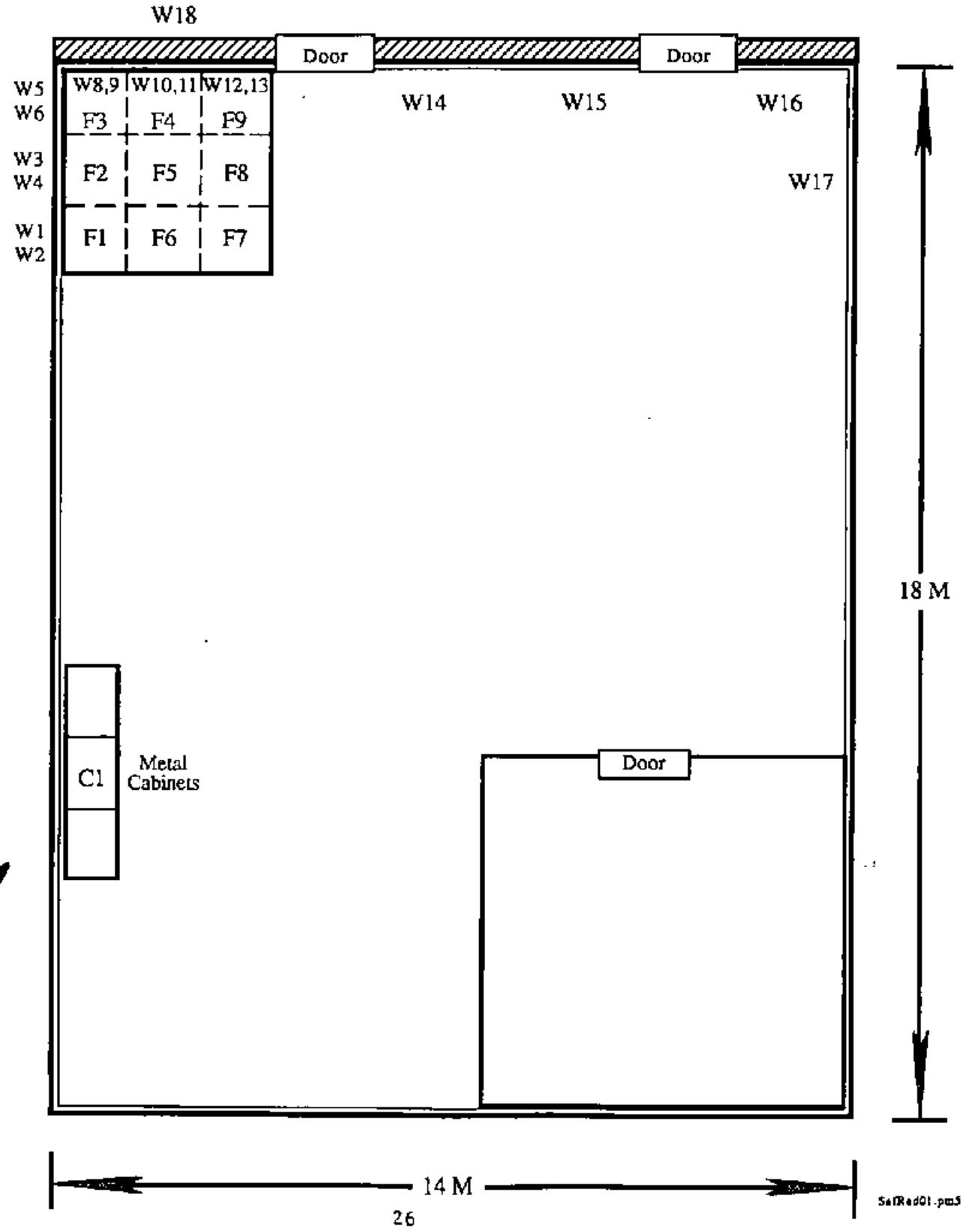
SURVEY LOCATIONS

BUILDING 319

175 27

BAY 6

Defense Distribution Depot Memphis Tennessee



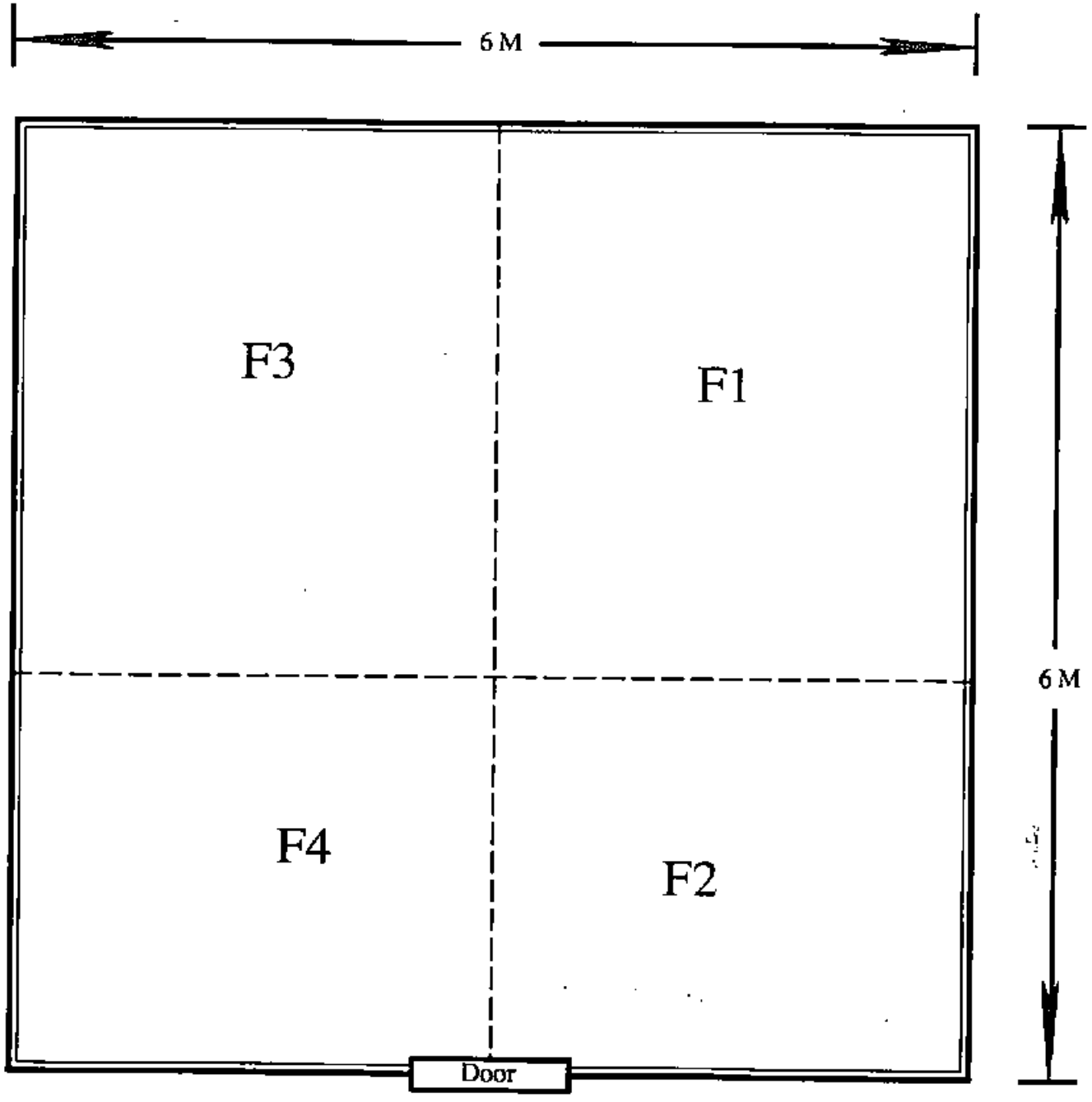
SafRad01.pm5

BUILDING 835

175 28

SMALL ROOM

Defense Distribution Depot Memphis Tennessee

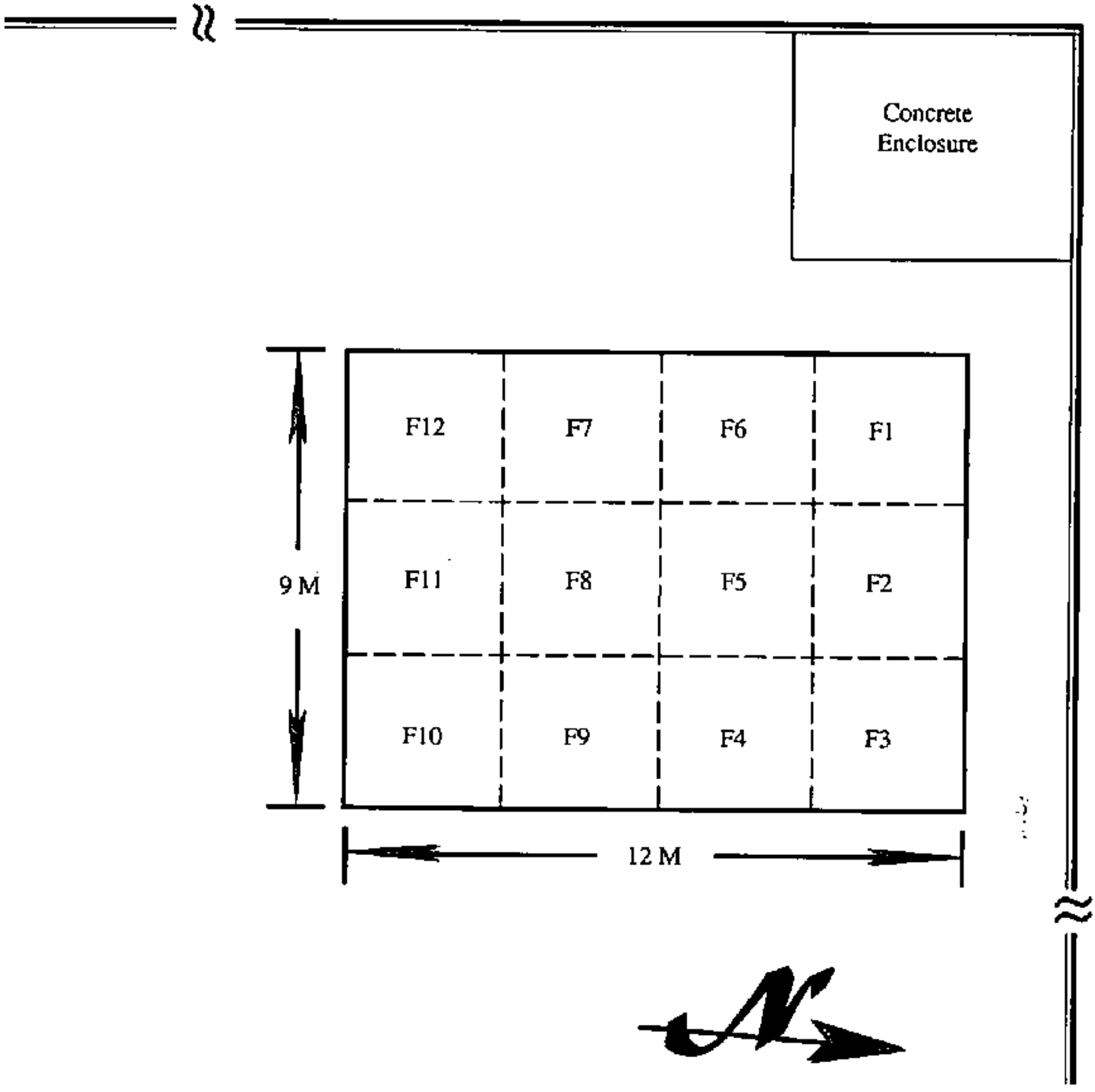


SmRm01.pm5

BUILDING 629

BAY 2

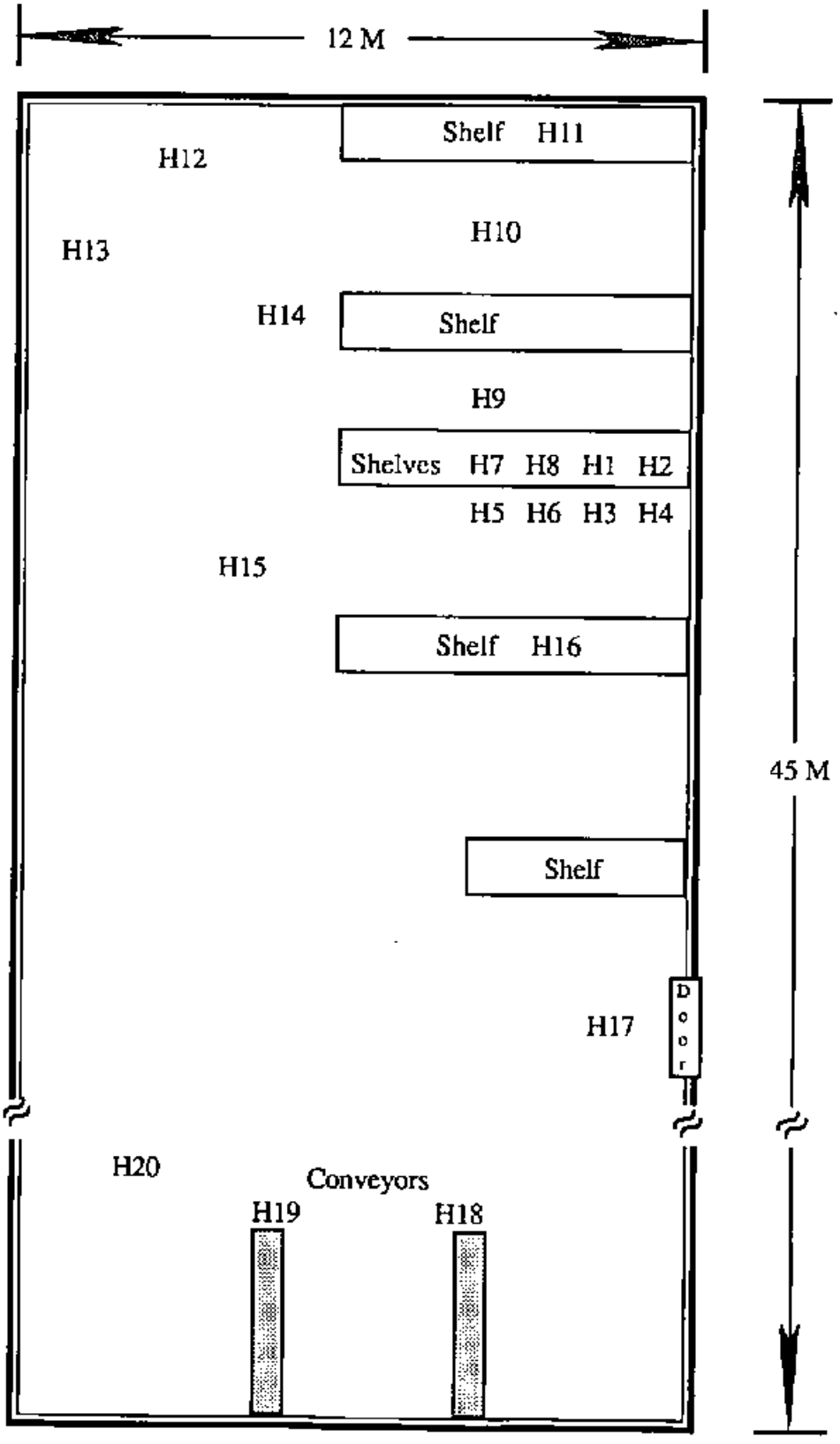
Defense Distribution Depot Memphis Tennessee



BUILDING 359 175 30

SECTION 3 WIRE CAGE

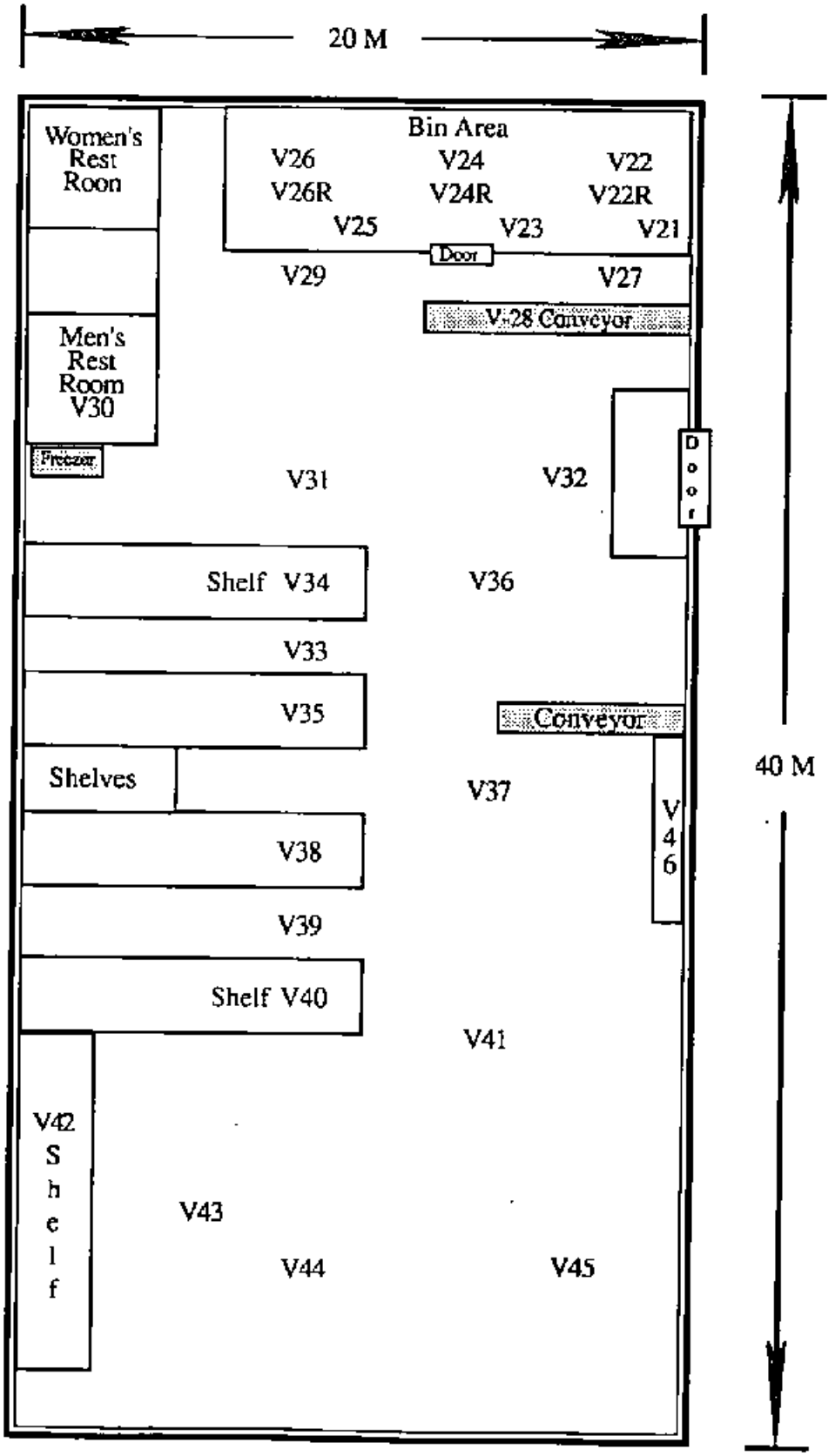
Defense Distribution Depot Memphis Tennessee



BUILDING 359 175 31

SECTION 3 SECURITY VAULT

Defense Distribution Depot Memphis Tennessee



SafRad01.pm5

RESULTS

Bldg 835 - OK - Smears to be evaluated
" 629 - OK - " " " "
" 359 - ? " " " "
" 319 - Floor - OK (Epoxy) " " " "
Outer Wall = Limit (fixed) α only
- Recommend complete survey of Bay 6 at later ti.
- Attempt to determine the radio isotope.
- Determine removability via wipe tests
- Recommend appropriate decon technique
= wipe down only due to α's discard as radwaste
- Include will work it tomorrow w/ his folks to expedite analysis report to be here 8/16
- Some alpha contam in pre-cast concrete wall
- Bay 6 - levels above limit (3m x 1m area both sides of door north wall)
- Will send wipe sample to another agency to determine isotope
  - thorium lantern mantels
  - radium watch faces
  > possible sources
- No health hazard associated w/ findings orders of magnitude more needed to cause health problems.
- hoping to use wire brush and snub off. Will catch and dispose waste as radwaste.
- will use Bldg 319/6 as radiological storage from now on out.
- Need to come up w/ PCB storage since we wanted to use 319/6 for that? Ursula will work Bay 1 to see if medical items are gone & can stay out.

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

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