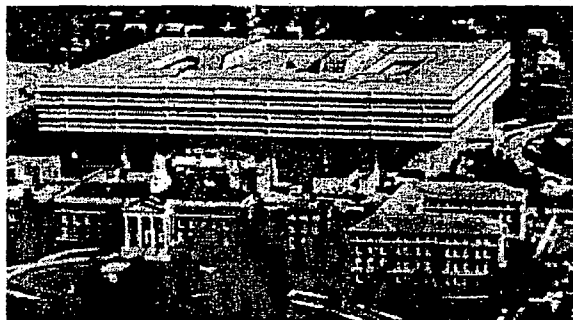




## WRAMC 1998 Annual Radiation Safety Review

### HEALTH PHYSICS OFFICE



### Health Physics Office

- ◆ Ensure that all operations conducted with ionizing and non-ionizing radiation sources are safe and meet all Federal and Army Regulations and Policies.
- ◆ Ensure that all radiation doses to radiation workers, members of the general public, and patients are as low as is reasonably achievable (ALARA) and the releases of radioactive material to the environment are minimized.

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA-2006-0238

Pollions Ex 2

TAB K

nm/19

## **MISSION**

### **Health Physics Office**

- ✦ Provide radiation protection and medical physics support to WRHCS, WRAIR and AFIP
- ✦ Act as the executive agent for the WRAMC NRC licenses and DARA
- ✦ Provide a Radiological Advisory Medical Team
- ✦ Provide regional support to the NARMC

## **RAMT**

- ✦ The responsibility for the RAMT mission as outlined in AR 40-13 states that the Commanding General, Walter Reed Medical Center establishes the RAMT with primary responsibility throughout the continental U.S.
- ✦ The mission of the RAMT is to assist and furnish radiological health hazard guidance to the on-scene commander or other responsible person at a radiological accident site, and the installation medical authority.

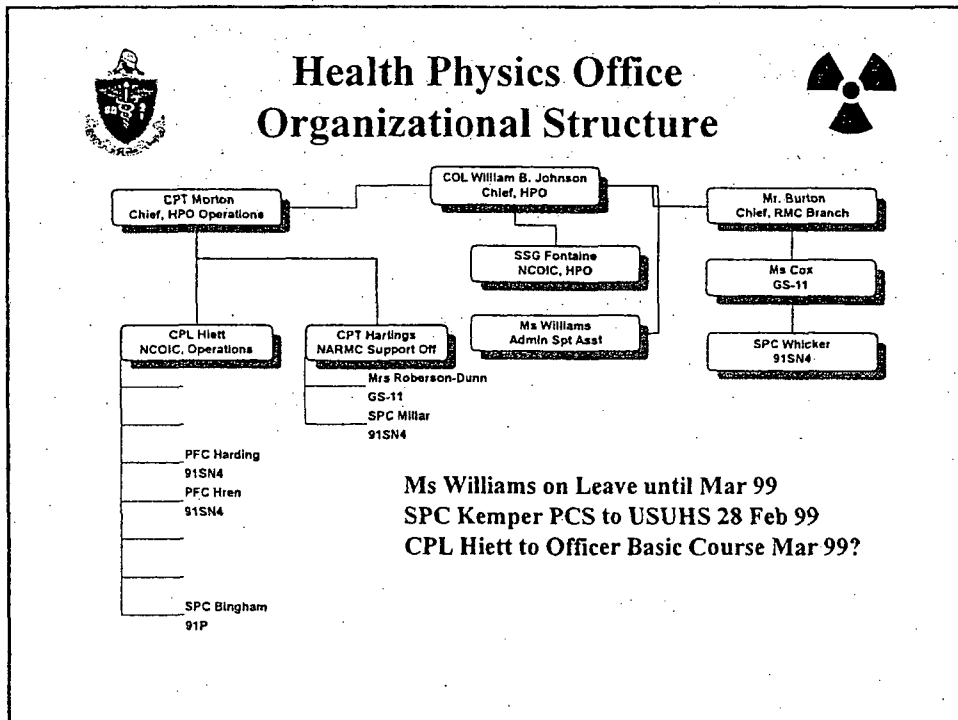
## Authorization for Radioactive Material Use

Use of radioisotopes at WRAMC is  
authorized under:

Nuclear Regulatory Commission (NRC) License # 08-01738-02;  
Broadscope Type A License for Medical Human and Non-Human  
Use (expiration 30 June 2004)

Nuclear Regulatory Commission (NRC) License # 08-01738-03;  
Self-shielded Irradiators (expiration 30 November 2001)

Department of the Army Radioactive Material Authorization  
(DARA) # 08-01-97 (expiration 30 June 2002)



## **WRAMC Dosimetry Program**



### **1998 Dosimetry Program Review**

Total Dosimeters Processed	10,668
Whole Body Dosimeters	5,311
Head/Neck Dosimeters	1,975
Extremity Dosimeters	3,331
Fetal Dosimeters	51
Bioassay Measurements	223

Results are extrapolations of data for the first three quarters of CY1998

## 1998 ALARA Review

	Level I	Level II
Whole Body	125 (3)	>375 (0)
Head/Neck	375 (4)	>1175 (0)
Extremity	1250 (5)	>3750 (2)

## 1998 Fetal Monitoring

Monitored	11
Receiving > 0 mrem	1
Receiving 0 mrem	10
Average Dose	19 mrem
Dose Range	NA

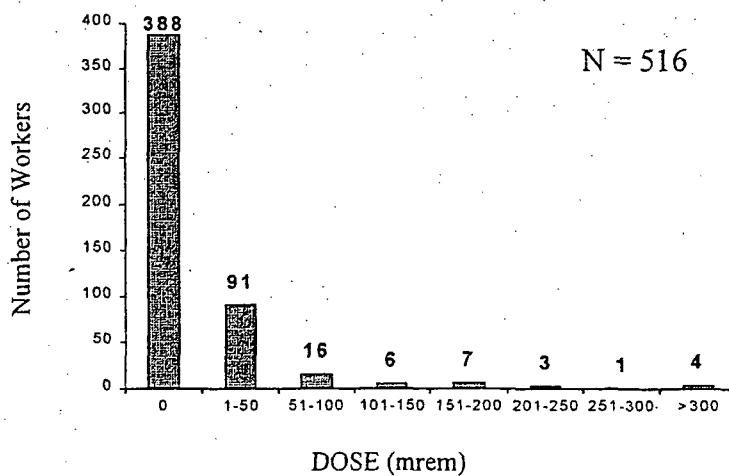
Average dose includes all doses > 0 mrem and results based on extrapolation of data from first three quarters of CY1998

### 1998 Total Effective Dose Equivalent (TEDE) Monitoring

Monitored	516
Receiving > 0 mrem	128 (25%)
Receiving 0 mrem	388 (75%)
Average Dose	46 mrem
Dose Range	1-601

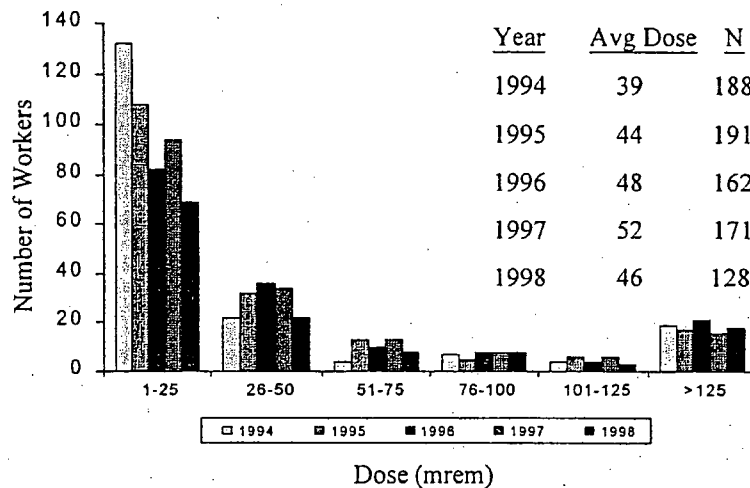
Average dose includes all doses > 0 mrem and results based on extrapolation of data from first three quarters of CY1998

### 1998 TEDE Doses



Average TEDE dose = 46 mrem and results are based on extrapolation of data from first three quarters of CY1998

## 94-98 TEDE Dose Comparison



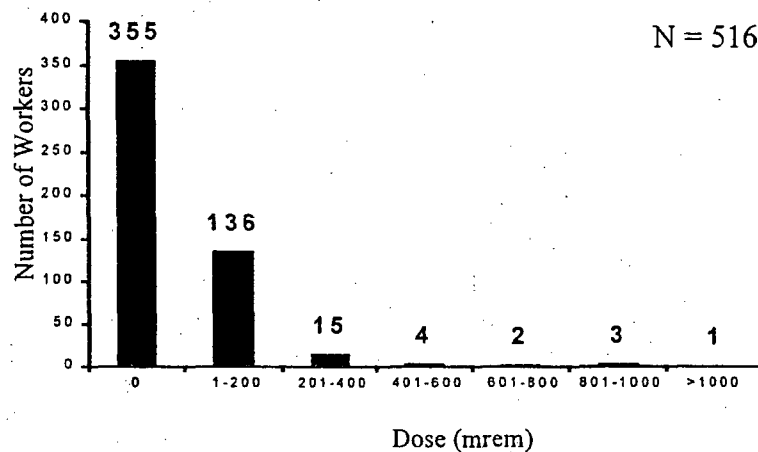
1998 results based on extrapolation of data from first three quarters of CY1998

## 1998 Lens of Eye Monitoring

Monitored	516
Receiving > 0 mrem	161 (31%)
Receiving 0 mrem	355 (69%)
Average Dose	102 mrem
Dose Range	4-3316 mrem

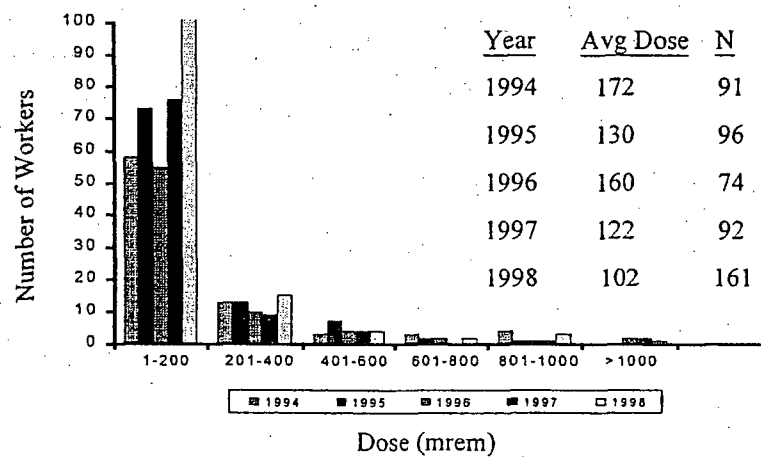
Average dose includes all doses > 0 mrem. Number monitored and average dose are based on extrapolation of data from first three quarters of CY1998

## 1998 Lens of Eye Doses



Average head and neck dose = 102 mrem and results are based on extrapolation of data from first three quarters of CY1998

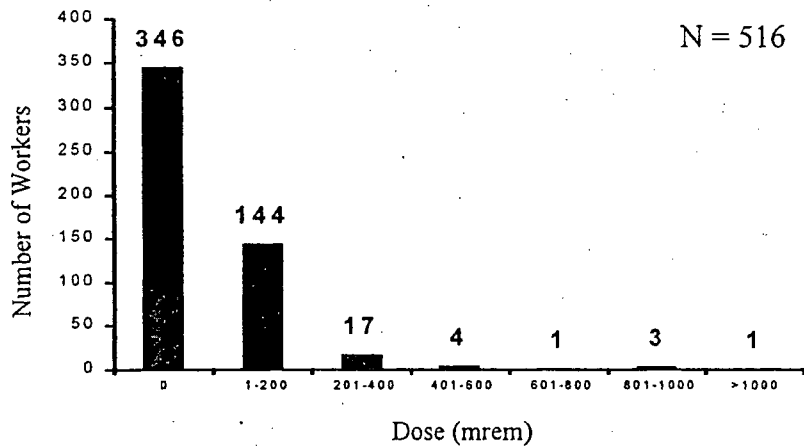
## 94-98 Lens of Eye Dose Comparison



1998 results based on extrapolation of data from first three quarters of CY1998



## 1998 Skin Radiation Doses



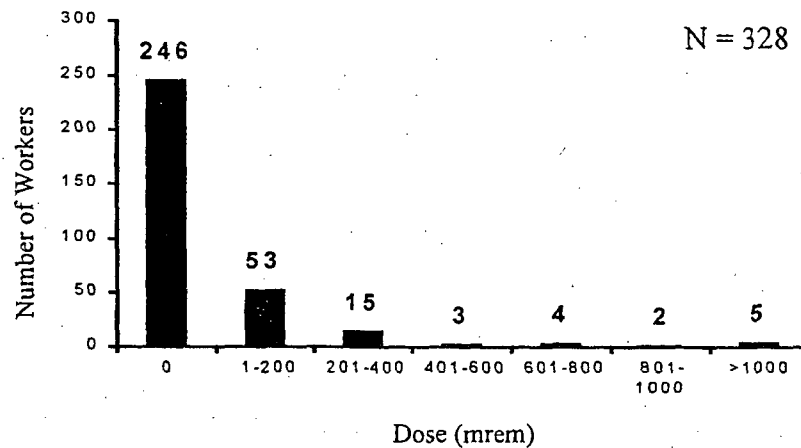
Average extremity dose = 102 mrem and results are based on extrapolation of data from first three quarters of CY1998

## 1998 Extremity Monitoring

Monitored	328
Receiving > 0 mrem	82 (25%)
Receiving 0 mrem	246 (75%)
Average Dose	319 mrem
Dose Range	12-3876 mrem

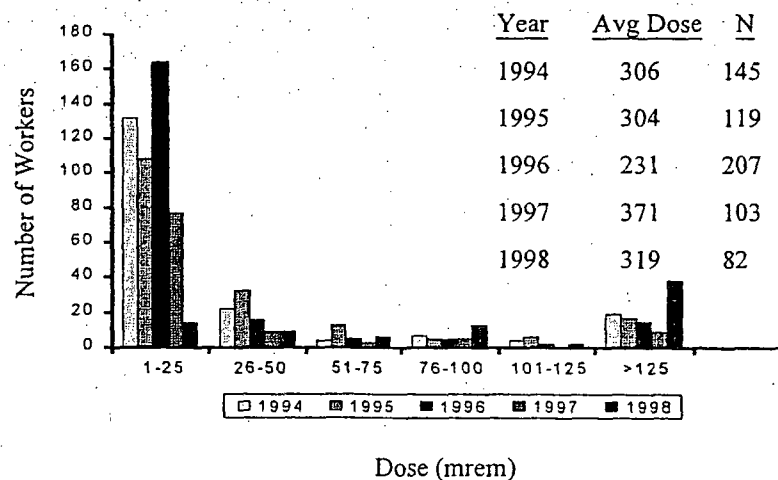
Average dose includes all doses > 0 mrem. Number monitored and average dose are based on extrapolation of data from first three quarters of CY1998

## 1998 Extremity Radiation Doses



Average extremity dose = 319 mrem and results are based on extrapolation of data from first three quarters of CY1998

## 94-98 Extremity Dose Comparison



1998 results based on extrapolation of data from first three quarters of CY1998

## 1998 Bioassay Annual Review

### Thyroid/Urine Bioassay

Total Bioassay Measurements	182
Routine Thyroid < 1 mrem (CEDE)	109
Post-therapy Thyroid < 1 mrem (CEDE)	58
Urine < 1 mrem (CEDE)	8
Routine Thyroid > 1 mrem (CEDE)	3
Post-therapy Thyroid > 1 mrem (CEDE)	4

## 1998 Bioassay Annual Review

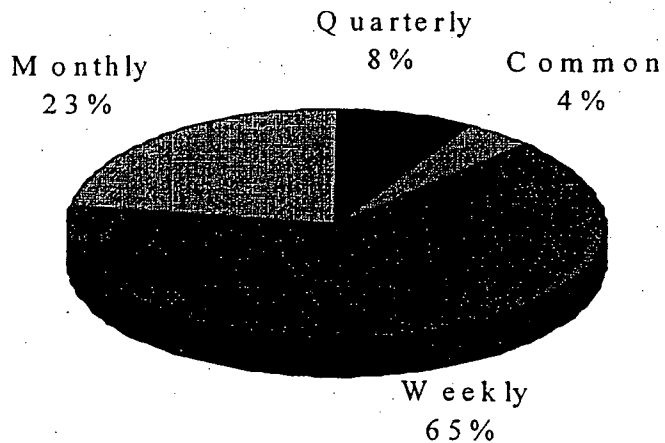
ORGAN	Dose (mrem)			
	HIGHEST	TOTAL	AVERAGE	RANGE
Gonads	.032	.079	.011	.0029 - .032
Breast	.10	.254	.036	.015 - .10
Lung	.80	1.959	.280	.019 - .80
Marrow	.08	.1961	.028	.0071 - .079
Surface	.07	.1788	.025	.0068 - .072
Thyroid	370	856	122.24	7.7 - 370
Remain	.10	.2453	.035	.0053 - .10
Effect	11	27.54	3.93	1.04 - 11

## 1998 Operational Review

✦ X-Ray Surveys	150
✦ Room Surveys	2279
✦ Air Sample Surveys	179
✦ Therapies Supported	51
✦ Equipment Surveys	45
✦ Laboratory Samples Processed	29,918
✦ Meters Calibrated	327

## Room Survey Breakdown

2,279 Total Surveys



## 1998 Therapy Support

	Brachytherapy	Iodine Ablation	Permanent Implant
Total	6	27	18
Average Therapy Dose	65 mgRaeq	163 mCi	280 mCi
Isotope	Cs-137/Ir-192	I-131	Pd-103
Patients Adjacent	N/A	42	N/A
Patients Exposed	N/A	33	N/A
Range of Dose Received	N/A	0-46 mrad	N/A
Average Dose	N/A	8.5 mrad	N/A

## Decommissioning



## **Decommissioning**

### **Health Physics Office**

**Forest Glenn      Bldg 506\***

**Bldg 508**

**Rockville      Gillette 1st Floor\***

### **CHPPM**

**Forest Glenn      Bldg 500 Phase I      \$75,000**

**Bldg 500 Phase II\*      \$50,000**

**\* Indicates decommissioning is not complete**

## **1998 Radiation Safety Training**

<u>Training Type</u>	<u>Attendees</u>
HPO Inservice	615
IPRP	115
IRP	178
ALW	345
<b>TOTAL</b>	<b>1,253</b>

HPO Inservices include annual and initial training of radiation workers and special topic seminars both locally and at remote facilities.

IPRP: Introductory Principles of Radiation Protection Course taught by HPO staff

IRP: Initial Radiation Protection Training conducted by Principle Users

ALW: Annual Laboratory Working Training conducted by Principle Users

## 1998 Radioactive Material Control Review

Sealed Source Inventories	390
Authorization Amendments	120
Authorization Audits	86
Shipments Received	731
Radioactive Waste Shipped (ft <sup>3</sup> )	135.5

18-55 gal  
Drums

## 1998 Isotope Inventory

TOTAL ISOTOPE INVENTORY FOR WALTER REED ARMY MEDICAL CENTER AS OF 22 JANUARY 1999 (INCLUDES RADIOACTIVE WASTE)			
ISOTOPE	ON HAND ACTIVITY (mCi)	LICENSE LIMIT (mCi)	PERCENT OF LICENSE LIMIT
<sup>241</sup> Am			95.85
<sup>241</sup> Am	<0.1		0.00
<sup>14</sup> C	31.41		1.57
<sup>60</sup> Co	0.2		
<sup>60</sup> Co			0.31
<sup>51</sup> Cr	14.85	750	1.98
<sup>137</sup> Cs			54.1
<sup>137</sup> Cs			38.01
<sup>137</sup> Cs			23.98
<sup>137</sup> Cs			0.03
<sup>137</sup> Cs			28.47
<sup>153</sup> Gd			23.68
<sup>3</sup> H	249.3	5,000	4.99

Inventory current as of 22 JAN 99

Page 1 of 2

Ex 2

## 1998 Isotope Inventory

<sup>125</sup> I	3.85	1,000	0.39
<sup>125</sup> I	0.1076	1,000	0.01
<sup>129</sup> I	<0.1	1,000	0.00
<sup>131</sup> I	15.9	2,000	0.79
<sup>192</sup> Ir			3.68
<sup>99m</sup> Tc	2,820	23,000	12.26
<sup>63</sup> Ni	28.3	1,000	2.83
<sup>32</sup> P	9.27	2,000	0.47
<sup>103</sup> Pd	12.853	3,000	0.43
<sup>239</sup> Pu	<0.1	<0.1	28.4
<sup>226</sup> Ra	10.04	50	20.08
<sup>35</sup> S	19.99	1,000	2.00
<sup>90</sup> Sr			25.54
<sup>99m</sup> Tc	319.9	23,000	1.39
<sup>133</sup> Xe	41.98	2,000	2.10
Atomic No 1-83	36.8502	26,000	0.14
TOTALS			4.96

Ex 2

Inventory current as of 22 JAN 99

Page 2 of 2

## 1998 Liquid Radioactive Waste

Isotope	Activity Discharged	Regulatory Limit	Percent of Limit
Tritium	252.307 mCi	5000 mCi	5.1 %
Carbon-14	1.154 mCi	1000 mCi	0.1 %
all other	27.010 mCi	1000 mCi	2.7 %

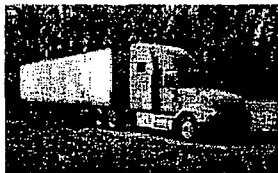
Total activity released to sewer: 280 mCi

Total waste collected: 2,780 liters

No limits of 10 CFR 20.2003 were exceeded







## 1998 Radioactive Waste Shipments

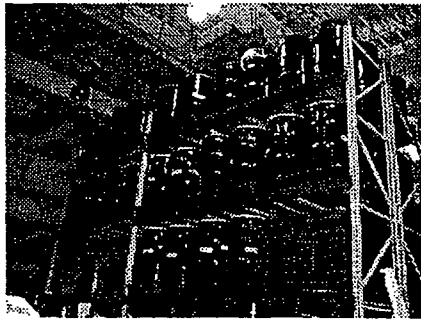
<u>Type</u>	<u>Cubic Feet</u>
Dry Solid Waste	82.5
Organic	4.6
Biological	23
Liquid Scintillation	<u>30</u>
<b>TOTAL</b>	140.1

Note: Waste is shipped in 7.5 ft<sup>3</sup> drums

✓ 19 - 55 gal  
Drum

## 1998 Radioactive Waste Disposition

<u>Type</u>	<u>mCi</u>
Dry Solid Waste (Shipped)	242.47
Biological Waste (Shipped)	19.26
Biological Waste (Decayed)	1.33
Dry Solid Lab Waste (Decayed)	135.8
Organic Waste (Shipped)	.065
Liquid Scintillation (Shipped)	<u>.67</u>
<b>TOTAL</b>	399.6



## 1998 Decayed Radioactive Waste

<u>Type</u>	<u>Ft<sup>3</sup></u>
Dry Solid (Lab)	192
Nuclear Medicine & Therapy	376
Laundry	272
Needle Boxes	<u>312</u>
<b>TOTAL</b>	1,152

*~ 154 - 55 gal down.*

## Effluent Concentration

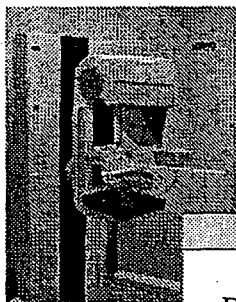
1998 Monitoring Period

Location	I-125 uCi/cm <sup>3</sup> Limit 3E-10	I-131 uCi/cm <sup>3</sup> Limit 2E-10
Building 2 Rm 7A07	4.9 E-12	9.24 E-11
Building 516	2.38 E-13	2.99 E-13

## Room Air Concentration

1998 Monitoring Period

Location	I-125 uCi/ml Limit 3E-9	I-131 uCi/ml Limit 2E-9
Building 2 Rm 7A07	4.24 E-12	8.33 E-11
Building 516	1.31 E-13	1.28 E-13



## Mammography Quality Standards Act Support

Facility	Location	Equipment
WRAMC	Washington, DC	5 Systems
Dewitt ACH	Ft Belvoir, VA	3 Systems
Kimbrough ACC	Ft Meade, MD	3 Systems
Patterson AHC	Ft Monmouth, NJ	1 System
Dunham AHC	Carlisle Barracks, PA	1 System
McDonald ACH	Ft Eustis, VA	1 System
Kenner ACH	Ft Lee, VA	1 System
Womack AMC	Ft Bragg, NC	3 Systems
Ireland ACH	Ft Knox, KY	2 System
Walson AFH	McGuire AFB, NJ	1 System
	<b>TOTAL</b>	<b>21 Systems</b>

**COVER SHEET FOR CORRESPONDENCE**  
**USE THIS COVER SHEET TO PROTECT ORIGINALS OF**  
**MULTI-PAGE CORRESPONDENCE**