

Attachment 3
Resrad Build Output Report
For Residual Contamination in Floor Above Reactor
Room R3

[illegible]

Input Parameters.....	0-1
For Each Time (I) :.....	
Time Specific Parameters.....	I-1
Receptor-Source Dose Summary.....	I-2
Dose by Pathway Detail.....	I-3
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Full Summary.....	F-1

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 0- 1 :      2 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP

```

[illegible]

```

Number of Sources      :    1
Number of Receptors    :    1
Total Time             : 3.650000E+02 days
Fraction Inside        : 5.000000E-01

```

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion (Dust) [m2/hr]
1	1	1.000	1.000	1.000	1.000	1.80E+01	1.00E-04

III Receptor-Source Shielding Relationship III

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
AA				
1	1	2.40E+00	1.50E+01	Concrete

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 0- 2 : 3 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP

íííííííííí Building Information íííííííííí

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Air Exchanges [m3/hr]	
Area [m2]		

	*	*
	*	*
	*	<=Q01: 7.20E+01
H1: 2.500	* Room 1	* Q10 : 7.20E+01
	* LAMBDA: 8.00E-01	*
Area 36.000	*	*
	*	*

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 0- 3 : 4 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP

Source Information

Source: 1

Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00[m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :4.06E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide Concentration

Dose Conversion Factors

AA

	Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]

GD-152	0.000E+00	1.610E-04	2.430E-01	0.000E+00	0.000E+00	0.000E+00
EU-154	8.100E-01	9.550E-06	2.860E-04	1.390E-04	4.810E-06	7.180E-03
EU-152	1.200E+01	6.480E-06	2.210E-04	1.290E-04	4.390E-06	6.610E-03
CO-60	1.200E+00	2.690E-05	2.190E-04	2.750E-04	1.020E-05	1.470E-02

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 1- 1 : 5 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP Evaluation Time: 0.000000 years

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii      Assessment for Time: 1      iii
iii      Time =0.00E+00 yr          iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

iiiiiiii Source Information iiii

Source: 1
 Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
 Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate :0.000E+00 [gm/hr]
 Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
 Region : 1
 Thickness [cm] :4.06E+01
 Fraction Contaminated :1.00E+00
 Density [g/cm3] :2.40E+00

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	3.782E-14
	EU-154	7.789E-01
	EU-152	1.169E+01
	CO-60	1.124E+00

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 1- 2 : 6 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP Evaluation Time: 0.000000 years

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	2.4E+00	2.4E+00
Total	2.4E+00	2.4E+00

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 1- 3 :      7 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:      0.000000      years

```

Pathway Detail of Doses
 [mrem]

Source:	1					
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.36E+00	1.35E-06	1.54E-08	3.13E-06	0.00E+00	3.04E-07
Total	2.36E+00	1.35E-06	1.54E-08	3.13E-06	0.00E+00	3.04E-07

Nuclide Detail of Doses
 [mrem]

Nuclide	Receptor 1	Total
EU-154		
EU-154	1.33E-01	1.33E-01
GD-152		
GD-152	8.40E-18	8.40E-18
EU-152	1.75E+00	1.75E+00
CO-60		
CO-60	4.71E-01	4.71E-01

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 2- 1 :      9 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:      10.0000      years

```

```

#####
#####
iii      Assessment for Time:  2      iii
iii      Time =1.00E+01  yr      iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	4.06E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	6.230E-13
	EU-154	3.543E-01
	EU-152	6.952E+00
	CO-60	3.019E-01

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 2- 2 : 10 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP Evaluation Time: 10.0000 years

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	1.2E+00	1.2E+00
Total	1.2E+00	1.2E+00

Pathway Detail of Doses
 [mrem]

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** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 2- 4 : 12 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP Evaluation Time: 10.0000 years

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
[mrem]

Source: 1

Nuclide Receptor		Total
1		
EU-154		
EU-154	6.06E-02	6.06E-02
GD-152		
GD-152	1.66E-16	1.66E-16
EU-152	1.04E+00	1.04E+00
CO-60		
CO-60	1.26E-01	1.26E-01

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 3- 1 :    13 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    100.000    years

```

```

#####
#####
iii      Assessment for Time: 3      iii
iii      Time =1.00E+02 yr          iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	4.06E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	1.473E-12
	EU-154	2.956E-04
	EU-152	6.451E-02
	CO-60	2.187E-06

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 3- 2 : 14 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP Evaluation Time: 100.000 years

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	9.7E-03	9.7E-03
Total	9.7E-03	9.7E-03

Pathway Detail of Doses
 [mrem]

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Nuclide Detail of Doses
 [mrem]

Nuclide	Receptor 1	Total
EU-154		
EU-154	5.06E-05	5.06E-05
GD-152		
GD-152	3.93E-16	3.93E-16
EU-152	9.68E-03	9.68E-03
CO-60		
CO-60	9.16E-07	9.16E-07

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 4- 1 :    17 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    1000.00    years

```

```

#####
#####
iii      Assessment for Time:  4      iii
iii      Time =1.00E+03 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	4.06E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	1.481E-12
	EU-154	4.827E-35
	EU-152	3.055E-22
	CO-60	0.000E+00

```
** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 4- 2 :    18 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    1000.00    years
```

[illegible]

Source Contributions to Receptor Doses
 [mrem]

		Source 1	Total
Receptor	1	3.9E-16	3.9E-16
Total		3.9E-16	3.9E-16

Pathway Detail of Doses
 [mrem]

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```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 4- 4 :    20 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    1000.00    years

```

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Total
EU-154		
EU-154	0.00E+00	0.00E+00
GD-152		
GD-152	3.95E-16	3.95E-16
EU-152	4.58E-23	4.58E-23

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 5- 1 :    21 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    10000.0    years

```

```

#####
#####
iii      Assessment for Time: 5      iii
iii      Time =1.00E+04 yr          iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	4.06E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	1.478E-12
	EU-154	0.000E+00
	EU-152	0.000E+00
	CO-60	0.000E+00

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 5- 2 :    22 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    10000.0    years

```

[illegible]

Source Contributions to Receptor Doses
 [mrem]

		Source 1	Total
Receptor	1	3.9E-16	3.9E-16
Total		3.9E-16	3.9E-16

Pathway Detail of Doses
 [mrem]

23


```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Nuclide	Receptor 1	Total
GD-152		
GD-152	3.95E-16	3.95E-16

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 6- 1 :    25 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    100000.    years

```

```

#####
#####
iii      Assessment for Time:  6      iii
iii      Time =1.00E+05 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:1.00E+01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.98E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	GD-152	1.449E-12
	EU-154	0.000E+00
	EU-152	0.000E+00
	CO-60	0.000E+00

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 6- 2 : 26 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP Evaluation Time: 100000. years

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	3.9E-16	3.9E-16
Total	3.9E-16	3.9E-16

Pathway Detail of Doses
 [mrem]

27

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: 6- 4 :    28 **
Title : WRAIR Building 40 Irradiated Concrete
Input File : C:\WINBLD\WRIC.INP  Evaluation Time:    100000.    years

```

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Total
GD-152		
GD-152	3.95E-16	3.95E-16

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 10:12 Page: F- 1 : 29 **
 Title : WRAIR Building 40 Irradiated Concrete
 Input File : C:\WINBLD\WRIC.INP

```

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iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii      RESRAD-BUILD Dose (Time) Tables      iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Receptor Doses Received for the Exposure Duration
 iii
 (mrem)

	Evaluation Time [yr]					
	0.00E+00	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05
1	2.36E+00	1.23E+00	9.73E-03	3.95E-16	3.95E-16	3.95E-16

Receptor Dose/Yr Averaged Over Exposure Duration
 iii
 (mrem/yr)

	Evaluation Time [yr]					
	0.00E+00	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05
1	2.36E+00	1.23E+00	9.73E-03	3.95E-16	3.95E-16	3.95E-16