Rancho Seco Nuclear Generating Station Decommissioning Technical Basis Document	DTBD–05-005 Revision No. 0 DPT 05-037 RIC 2A.900

DCGLs for RSNGS Activated and Volumetrically Contaminated Bulk Materials

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1.0 PURPOSE

The purpose of this Decommissioning Technical Basis Document (DTBD) is to establish single nuclide derived concentration guideline levels (DCGLs) that are appropriate for evaluating activated and/or volumetrically contaminated bulk material at the Rancho Seco Nuclear Generating Station (RSNGS) while performing characterization or final status surveys.

2.0 DISCUSSION

Single nuclide DCGL values for structural surfaces were calculated in DTBD-04-004, DCGLs for RSNGS Structural Surfaces, [Reference 7.1]. While these single nuclide DCGLs are applicable to most structural surfaces, the potential exists that some structural surfaces are the face surfaces of structural components containing volumetric contamination arising from neutron activation of the structural component's materials of construction. The possibility also exists for some volumetric contamination caused by the migration of surface contamination into the materials of construction. Therefore, it is necessary to calculate single nuclide DCGLs for bulk materials in order to evaluate these materials during the conduct of characterization or final status surveys.

The RESRAD-BUILD computer code developed by Argonne National Laboratory was used to calculate these single nuclide DCGLs for bulk materials since it has the capability to calculate dose from the surfaces of volumetrically contaminated materials.

3.0 DEFINITIONS

DCGL: A derived, radionuclide-specific activity concentration within a survey unit corresponding to the release criterion. The DCGL is based on the spatial distribution of the contaminant and hence is derived differently for the nonparametric statistical test ($DCGL_W$) and the Elevated Measurement Comparison ($DCGL_{EMC}$). The $DCGL_W$ is the concentration of a radionuclide which, if distributed uniformly across a survey unit, would result in an estimated dose equal to the applicable dose limit. The $DCGL_{EMC}$ is the concentration of a radionuclide which, if distributed uniformly across a smaller limited area within a survey unit, would result in an estimated dose equal to the applicable dose limit. DCGLs are derived from activity/dose relationships through various exposure pathway scenarios.

Deterministic treatment: While using RESRAD-BUILD in the probabilistic mode, deterministic treatment is the assignment of a single conservative or site-specific, measured value to a parameter rather than a statistical distribution.

PWR: Pressurized water reactor.

RESRAD-BUILD: RESRAD-BUILD is a computer model designed to estimate radiation doses from RESidual RADioactivity in BUILDings.

Stochastic treatment: While using RESRAD in the probabilistic mode, stochastic treatment is the assignment of a statistical distribution for the value of a parameter.

Unity rule (mixture rule): A rule applied when more than one radionuclide is present at a concentration that is distinguishable from background and where a single concentration comparison does not apply. In this case, the mixture of radionuclides is compared against default concentrations by applying the unity rule. This is accomplished by determining: 1) the ratio between the concentration of each radionuclide in the mixture, and 2) the concentration for that radionuclide in an appropriate listing of default values. The sum of the ratios for all radionuclides in the mixture should not exceed 1.

4.0 TECHNICAL POSITION

The single nuclide DCGLs provided in Table 6-1 are appropriate for evaluating activated or volumetrically contaminated bulk material at RSNGS while performing characterization or final status surveys.

5.0 LIMITATIONS

The DCGL values provided in Table 6-1 are single nuclide DCGLs. That is, a concentration of an individual radionuclide at the specified DCGL value will result in a calculated annual dose to an industrial worker of 25 millirem. If multiple radionuclides are present in the activated/volumetrically contaminated bulk material, the unity rule must be applied to allowable radionuclide concentrations to maintain the total dose from the radionuclide mixture to 25 millirem per year. If multiple sources are present (walls), then the bulk material DCGLs must be reduced to account for the additional sources.

6.0 TECHNICAL BASES

6.1 Radionuclides of Concern for Bulk Material Dose Calculations

A site-specific suite of potential radionuclides for use at RSNGS was derived in DTBD-04-001, Radionuclides for Consideration During Rancho Seco Nuclear Generating Station Characterization or Final Status Surveys, [Reference 7.2]. This suite of potential radionuclides contained a total of 26 radionuclides. On May 28, 2004 RSNGS submitted an activated bioshield concrete sample and an activated bioshield concrete rebar sample to General Engineering Laboratories (GEL) for analysis of the entire suite of potentially present 26 radionuclides. Analysis of these two samples identified only seven of the potentially present 26 radionuclides as being present at concentrations above the minimum detectable activity (MDA) concentrations for the laboratory analyses.

NUREG/CR–3474, Long-Lived Activation Products in Reactor Materials, [Reference 7.3] also identifies radionuclides present in PWR activated bioshield materials. Table 5.4 of NUREG/CR–3474 lists radionuclides identified in activated average PWR bioshield concrete and Table 5.6 lists radionuclides identified in activated average PWR bioshield rebar. These tables identify an additional nine radionuclides contained in the site-specific suite of radionuclides that were not identified in the samples analyzed by GEL. Therefore, site specific activated bulk material single nuclide DCGLs are derived in this DTBD for a total of 16 radionuclides (7 identified by GEL plus the additional 9 identified in NUREG/CR–3474) including:

H-3	C-14	Fe-55	Ni-59
Co-60	Ni-63	Sr-90	Nb-94
Tc-99	Ag-108m	Cs-134	Cs-137
Eu-152	Eu-154	Eu-155	Pu-239

The remaining 10 radionuclides from the site-specific suite are considered to not be present as activation products; however, they may be present as volumetric contamination and bulk material single nuclide DCGLs have been calculated for them. These include:

Na-22	Sb-125	Pm-147	Np-237
Pu-238	Pu-240	Pu-241	Am-241
Pu-242	Cm-244		

6.2 Identification of RESRAD-BUILD Sensitive Parameters

DTBD-04-004, DCGLs for RSNGS Structural Surfaces, [Reference 7.1] used RESRAD-BUILD v3.22 to generate single nuclide structural surface DCGL values based on an industrial worker building occupancy scenario introduced in NUREG/CR-6755, Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code, [Reference 7.4]. DTBD-04-004 identified sensitive parameters for RESRAD-BUILD v3.22 and established the dose model for derivation of DCGLs for structural surfaces. The dose model included five contaminated surfaces, four walls and a floor. The ceiling was assumed to be either not contaminated, replaced if the room would be reused or to be so far above the floor that it would provide an insignificant contribution to dose to the receptor. Due to the large variety of room sizes in the structures that will remain after license termination, the room dimensions were determined probabilistically and given conservative deterministic values.

Only portions of the DTBD-04-004 dose model are considered appropriate for derivation of single nuclide DCGL values for activated or volumetrically contaminated bulk material. Because all interior concrete in the containment building, down to the carbon steel liner plate, will be removed as radioactive waste; only the carbon steel liner and concrete below it that are in the area formerly below the reactor vessel will have a potential of being significantly activated. Also, in other areas of the remaining structures the floors will have the highest possibility of containing volumetric contamination due to spills of radioactive liquids. Therefore, only the floor area of 137 m^2 derived in the DTBD-04-004 dose model will be used by replacing the floor surface source with a 1 foot thick (the most likely maximum depth of activation or contamination according to NUREG/CR-5884, Volume 2, Revised Analyses of Decommissioning for the Reference Pressurized Water Reactor Power Station, [Reference 7.5]) volume source having the same face surface area as the DTBD-04-004 dose model floor source.

Parameters other than the floor area that were found to be sensitive in DTBD-04-004 and treated deterministically for the derivation of structural surface single nuclide DCGLs may not remain sensitive for the volume source. Therefore, they were treated stochastically for the sensitivity analysis using the single volume source. Also, ANL/EAD/03-01, User's Manual for RESRAD-BUILD Version 3, [Reference 7.6] identifies an additional eight parameters associated with volume sources and for which statistical parameter distributions were developed. These parameters were also treated stochastically for the sensitivity analysis using the volume source.

For the case of tritium in the volume source, the tritium was assumed to be present in the volume source in the form of water that is released from the volume source in the form of vapor (HTO vapor). Under this assumption, ANL/EAD/03-01 recommends that the deposition velocity be treated deterministically and set to "0".

The same parameter selection process used in DTBD-04-004 was used for the sensitivity analysis. The parameter selection process is shown schematically in Attachment 8.1, RESRAD-BUILD Parameter Selection Process. The parameter values for sensitivity analysis and their assigned classification and priority are provided in Attachment 8.2, RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario. The parameter statistical distributions for RSNGS priority 1 and 2 physical parameters are listed in Attachment 8.3, Statistical Distribution Parameters for Sensitivity Analysis of Bulk Material and Sensitive Parameter Results –Industrial Worker Scenario, Table 8.3-1.

The parameter values for sensitivity analysis in Attachment 8.2 and the parameter distributions listed in Attachment 8.3 were loaded into RESRAD-

BUILD v3.3 separately for each radionuclide (electronic files H3ActSens.bld, C14ActSens.bld, Na22ActSens.bld, Fe55ActSens.bld, Ni59ActSens.bld, Co60ActSens.bld, Ni63ActSens.bld, Sr90ActSens.bld, Nb94ActSens.bld, Tc99ActSens.bld, Ag108mActSens.bld, Sb125ActSens.bld, Cs134ActSens.bld, Cs137ActSens.bld, Pm147ActSens.bld, Eu152ActSens.bld, Eu154ActSens.bld, Eu155ActSens.bld, Np237ActSens.bld, Pu238ActSens.bld, Pu239ActSens.bld), Pu240ActSens.bld, Pu241ActSens.bld, Am241ActSens.bld, Pu242ActSens.bld and Cm244ActSens.bld.

Once the parameter values and the statistical parameter distributions were loaded into RESRAD-BUILD v3.3 the code was run in the probabilistic mode for each radionuclide of concern to identify the sensitive parameters for that radionuclide. For each calculation, the Latin Hypercube sampling technique was used with a random seed of 1000, 300 observations and one repetition. RESRAD-BUILD v3.3 deterministic and probabilistic input parameters from the respective output reports are provided in Attachment 8.4, RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Analysis of Bulk Material Parameter Sensitivity Analysis, and Probabilistic Output Report result excerpts providing the calculated partial ranked correlation coefficient (PRCC) are provided in Attachment 8.5, RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Parameter Sensitivity Results for Bulk Material Parameter Sensitivity Analysis. The absolute value of the calculated PRCC at time 1 was then used to classify the parameters with statistical distributions as sensitive or non-sensitive. PRCC was chosen because NUREG/CR-6692, Probabilistic Modules for the RESRAD and RESRAD-BUILD Computer Codes [Reference 7.7], recommends that it be used when nonlinear relationships, widely disparate scales or long tails are present in the inputs and outputs. The maximum calculated PRCC values (either maximum positive or maximum negative) for sensitive parameters are listed in Attachment 8.3, Table 8.3-2. If the absolute value of the PRCC was greater than 0.10, then the parameter was classified as sensitive. If the absolute value of the PRCC was equal to or less than 0.10, then the parameter was classified as non-sensitive.

Values for use in dose modeling for the physical parameters with sensitive parameters were selected based on sensitivity of the calculated PRCC following the guidance of NUREG/CR-6676, Probabilistic Dose Analysis Using Parameter Distributions Developed for RESRAD and RESRAD-BUILD Codes [Reference 7.8]. If the absolute value of the PRCC was greater than 0.10, then the parameter value at either the 75% quartile or the 25% quartile was selected based on total effective dose equivalent (TEDE) correlation with the parameter. If the PRCC value was negative, the parameter to dose correlation is negative and the parameter value at the 25% quartile was selected. If the PRCC value was positive, the parameter to dose correlation is positive and the parameter value at the 75% quartile was selected. The sensitive parameter deterministic values and the highest sensitive parameter PRCC values (absolute value) of all

radionuclides evaluated are listed in Attachment 8.3, Table 8.3-1 (with an accuracy of three significant figures).

The parameter values were obtained from the RESRAD-BUILD probabilistic calculation results using the interactive output feature of the uncertainty results. A click on the left mouse button on “Uncertainty Graphics” from the “View” menu (Figure 6-1) opens the interactive output dropdown window (Figure 6-2). From the interactive output dropdown window the “Results” folder is selected. From the “Results” folder the “Graphics” sub-folder is selected. The “Cumulative Density” is then selected as the Plot Type, the “Input Vector” is selected as the Primary Object and the parameter of interest is selected (Figure 6-3). The parameter value is determined by a right mouse button click on the plot and selecting “Edit Chart Data” from the dropdown window. This opens the Data Grid Editor dropdown window (Figure 6-4). From this window, 0.25 or 0.75 is selected, as appropriate from the C2 column, which represents the appropriate quartile value. The corresponding parameter value is contained in the C1 column (Figure 6-5).

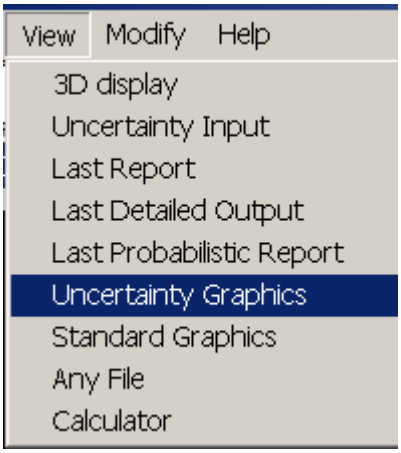


Figure 6-1

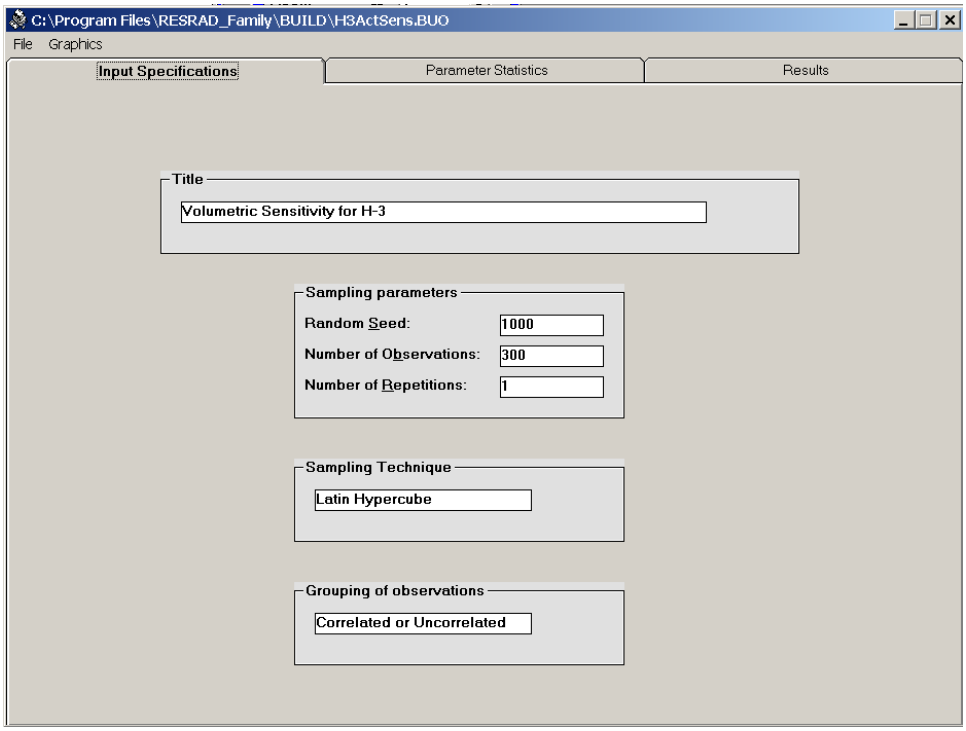


Figure 6-2

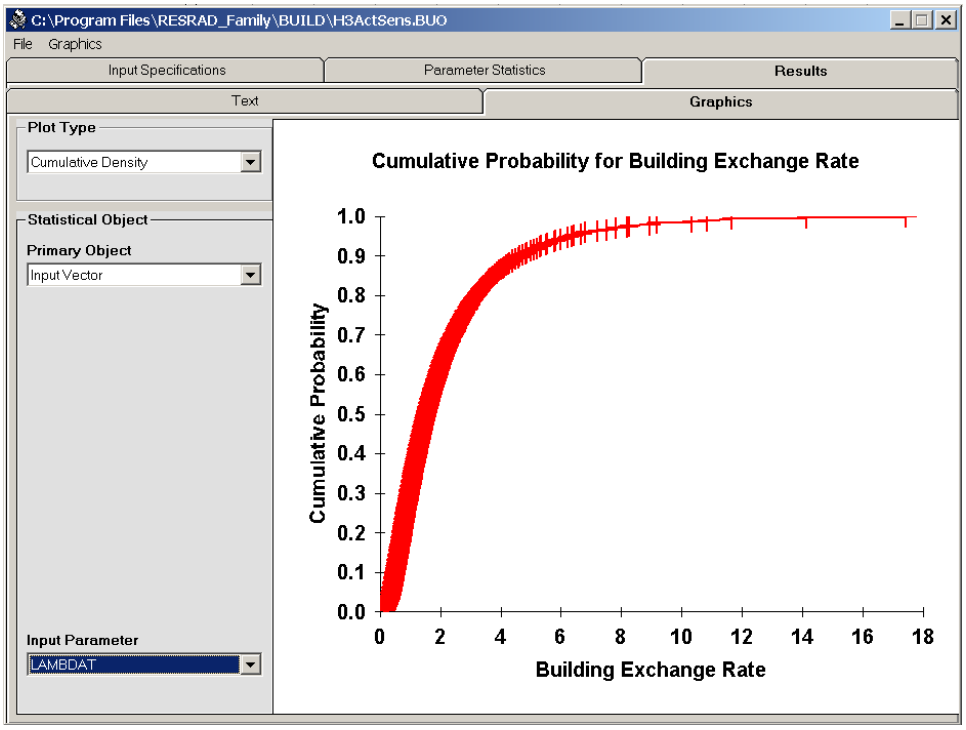


Figure 6-3

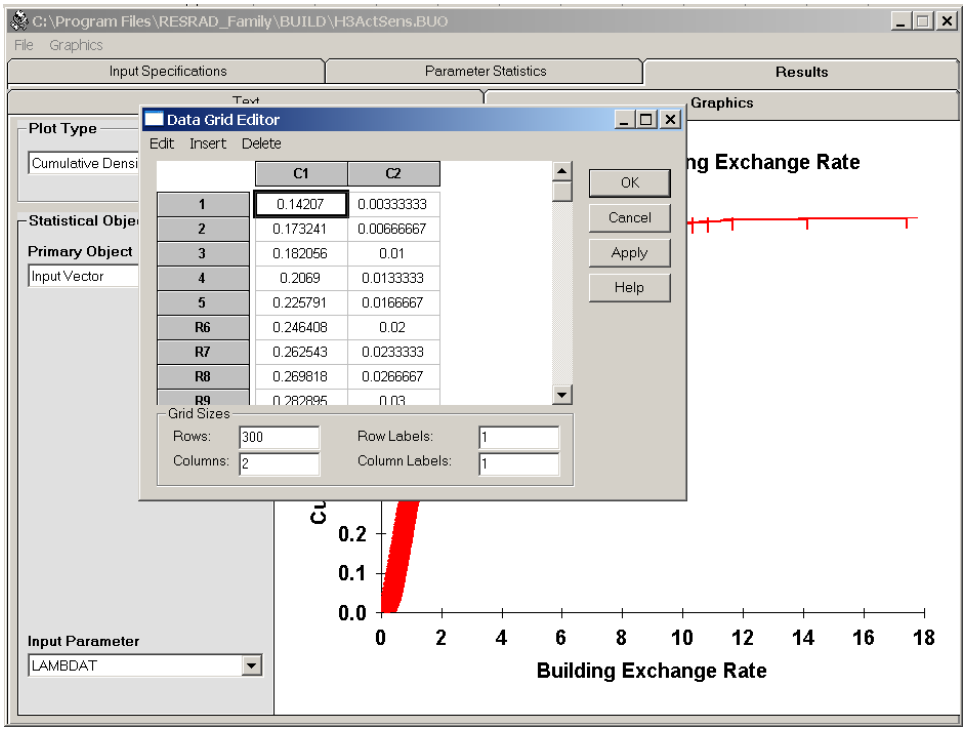


Figure 6-4

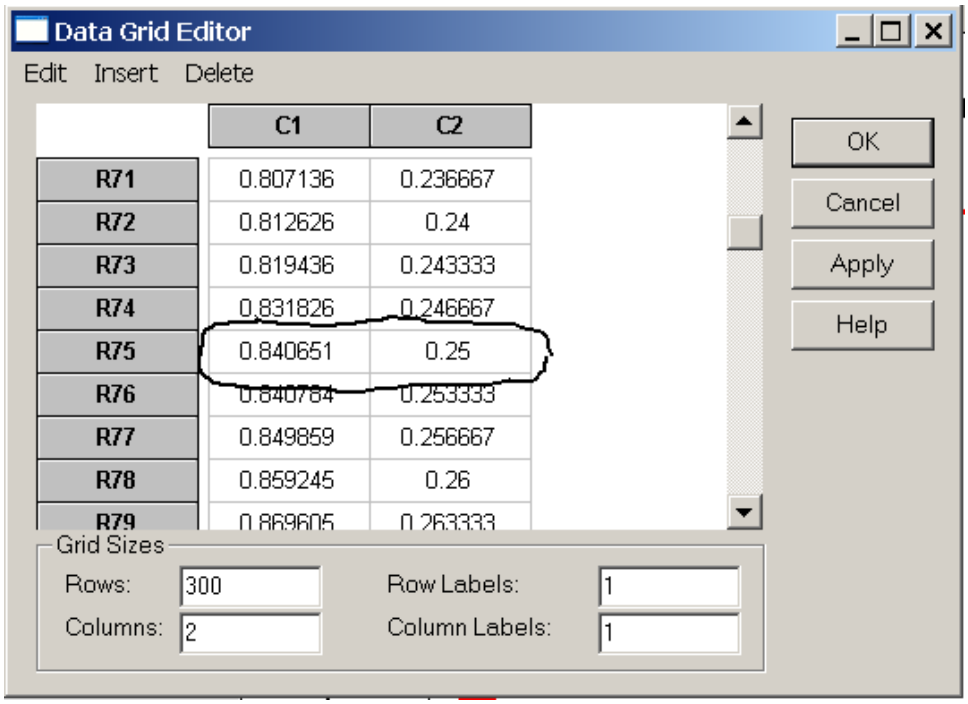


Figure 6-5

6.3 Derivation Of Single Nuclide Bulk Material DCGL Values

Single nuclide dose conversion factors (DCFs) were calculated probabilistically, repeating the RESRAD-BUILD v3.3 calculations performed in Section 6.2 by replacing the stochastic parameter distributions for each radionuclide identified to be sensitive in Attachment 8.3, Table 8.3-2, with the assigned deterministic parameter value listed in Attachment 8.3, Table 8.3-1, (electronic files H3ActDCGL.bld, C14ActDCGL.bld, Na22ActDCGL.bld, Fe55ActDCGL.bld, Ni59ActDCGL.bld, Co60ActDCGL.bld, Ni63ActDCGL.bld, Sr90ActDCGL.bld, Nb94ActDCGL.bld, Tc99ActDCGL.bld, Ag108mActDCGL.bld, Sb125ActDCGL.bld, Cs134ActDCGL.bld, Cs137ActDCGL.bld, Pm147ActDCGL.bld, Eu152ActDCGL.bld, Eu154ActDCGL.bld, Eu155ActDCGL.bld, Np237ActDCGL.bld, Pu238ActDCGL.bld, Pu239ActDCGL.bld, Pu240ActDCGL.bld, Pu241ActDCGL.bld, Am241ActDCGL.bld, Pu242ActDCGL.bld and Cm244ActDCGL.bld).

RESRAD-BUILD v3.3 deterministic and probabilistic input parameters from the respective output reports for each radionuclide are provided in Attachment 8.6, RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Derivation of Bulk Material Single Nuclide DCGLs, and Probabilistic Output Report result excerpts from page “Statistics for Dose (mrem) for Time: 1” are provided in Attachment 8.7, RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Results for Derivation of Bulk Material Single Nuclide DCGLs. The DCF for each radionuclide was determined by performing the above calculations with a source concentration of 1 pCi/gram to provide a DCF with the units of mrem/year per pCi/gram. The probabilistic dose used was the average total dose from the “Statistics for Dose (mrem) for Time: 1” report. The DCF for each radionuclide (with an accuracy of three significant figures) is provided in Table 6-1.

DCGL values were then calculated by dividing the dose limit (25 mrem/yr) by the DCF value to give DCGL values in units of pCi/gram. Results of these calculations are also in provided in Table 6-1.

Table 6-1

Activated Bulk Material Single Nuclide DCF and DCGL Values

Radionuclide	Dose Conversion Factor (mrem/yr per pCi/g)	DCGL (pCi/g)
H-3	3.18E-03	7.86E+03
C-14	1.56E-05	1.60E+06
Na-22	2.98E+00	8.39E+00
Fe-55	6.40E-07	3.91E+07
Ni-59	1.68E-06	1.49E+07
Co-60	3.54E+00	7.06E+00
Ni-63	3.65E-06	6.85E+06
Sr-90	6.01E-03	4.16E+03
Nb-94	2.11E+00	1.18E+01
Tc-99	3.39E-05	7.37E+05
Ag-108m	2.09E+00	1.20E+01
Sb-125	5.26E-01	4.75E+01
Cs-134	2.05E+00	1.22E+01
Cs-137	7.40E-01	3.38E+01
Pm-147	1.52E-05	1.64E+06
Eu-152	1.52E+00	1.64E+01
Eu-154	1.67E+00	1.50E+01
Eu-155	3.20E-02	7.81E+02
Np-237	3.34E-01	7.49E+01
Pu-238	6.92E-02	3.61E+02
Pu-239	8.46E-02	2.96E+02
Pu-240	8.45E-02	2.96E+02
Pu-241	1.22E-03	2.05E+04
Am-241	9.26E-02	2.70E+02
Pu-242	8.09E-02	3.09E+02
Cm-244	3.72E-02	6.72E+02

7.0 REFERENCES

7.1 DTBD-04-004, Revision 0, DCGLs for RSNGS Structural Surfaces

7.2 DTBD-04-001, Revision 2, Radionuclides for Consideration During Rancho Seco Nuclear Generating Station Characterization or Final Status Surveys

7.3 NUREG/CR–3474, Long-Lived Activation Products in Reactor Materials, August 1984

7.4 Argonne National Laboratory / U.S. Nuclear Regulatory Commission, NUREG/CR-6755, Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code, February 2002

7.5 U.S. Nuclear Regulatory Commission, NUREG/CR-5884, Volume 2, "Revised Analyses of Decommissioning for the Reference Pressurized Water Reactor Power Station," Draft Report for Comment, October 1993

7.6 Argonne National Laboratory, ANL/EAD/03-01, User's Manual for RESRAD-BUILD Version 3, June 2003

7.7 Argonne National Laboratory / U.S. Nuclear Regulatory Commission, NUREG/CR-6692, Probabilistic Modules for the RESRAD and RESRAD-BUILD Computer Codes, November 2000

7.8 Argonne National Laboratory / U.S. Nuclear Regulatory Commission, NUREG/CR-6676, "Probabilistic Dose Analysis Using Parameter Distributions Developed for RESRAD and RESRAD-BUILD Codes", May 2000

8.0 ATTACHMENTS

8.1 RESRAD-BUILD Parameter Selection Process

8.2 RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

8.3 Statistical Distribution Parameters for Sensitivity Analysis of Bulk Material and Sensitive Parameter Results –Industrial Worker Scenario

8.4 RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Analysis of Bulk Material Parameter Sensitivity Analysis

8.5 RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Parameter Sensitivity Results for Bulk Material Parameter Sensitivity Analysis

8.6 RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Derivation of Bulk Material Single Nuclide DCGLs

8.7 RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Results for Derivation of Bulk Material Single Nuclide DCGLs

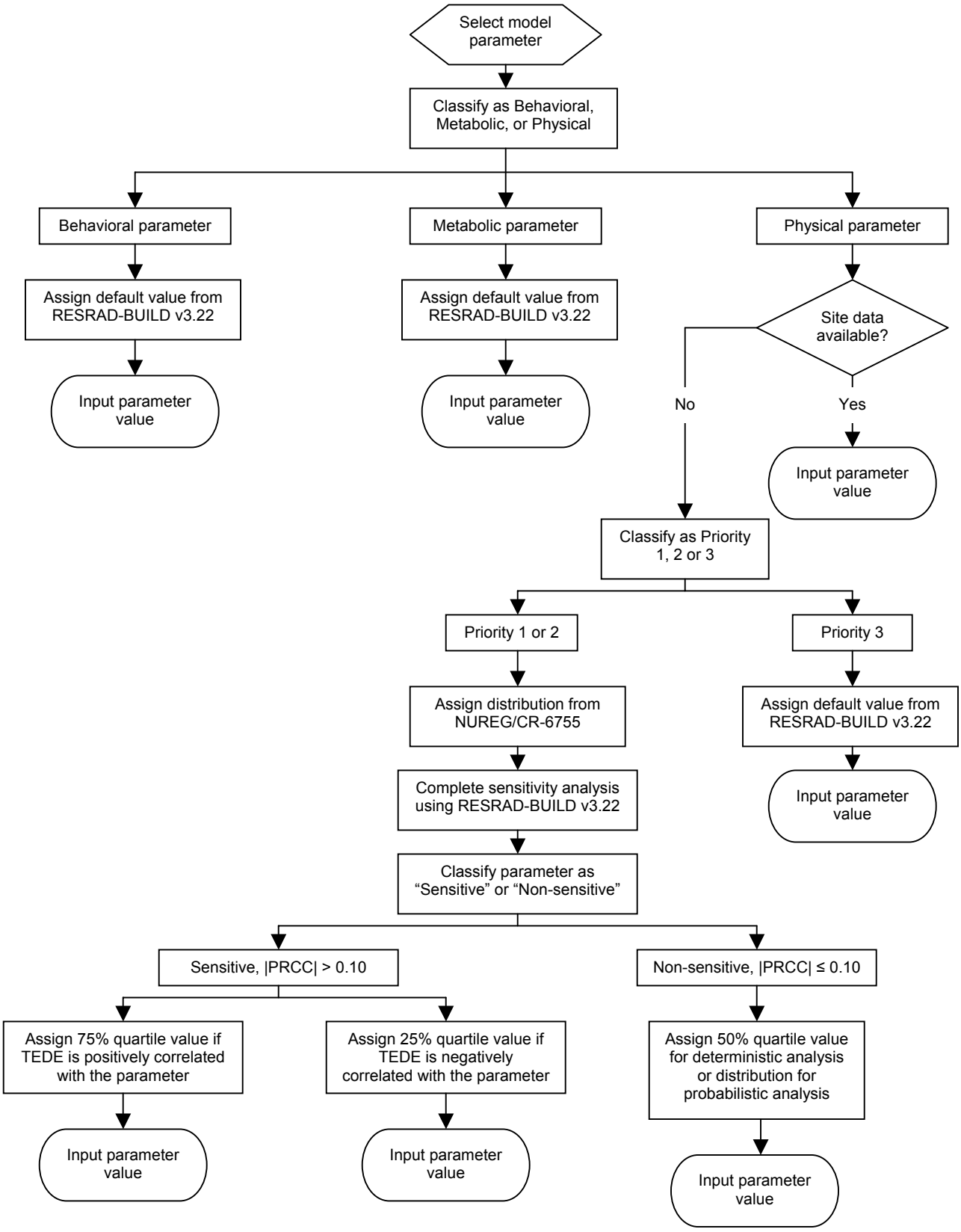
9.0 RESPONSIBLE INDIVIDUAL

Leon E. Brown

Attachment 8.1

RESRAD-BUILD Parameter Selection Process

Parameter Selection Process



Attachment 8.2

RESRAD-BUILD v3.22 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

Parameter							
Name	**Description**	**Class[1]**	**Priority[2]**	**Treatment[3]**	**Units**	**Parameter Value**	**Basis for Parameter Selection**
TIME PARAMETERS							
TTIME	Exposure duration	B	3	D	d	365.25	NUREG/CR-5512, Vol. 1
FTIN	Indoor fraction	B	2	D	-	0.267	NUREG/CR-5512, Vol. 3 Section 5.2.2.4 to match the 97.4 d/yr time in the building. This is the time the average member of the group spends in the building.
NTIME	Number of times for calculation	P	3	D	-	2	RESRAD-BUILD current default
DOSE_TIME	Time	P	3	D	yr	1	NUREG/CR-5512, Vol. 3 Section 5.2.2.4
POINT	Maximum time integration points	P	3	D	-	1	Argonne National Laboratory recommended value for probabilistic calculations
BUILDING PARAMETERS							
NROOM	Number of rooms	P	3	D	-	1	NUREG/CR-5512 building occupancy scenario assumes only one contaminated room
UD	Deposition velocity	P	2	S	m/s	Loguniform distribution	NUREG/CR-6755, Section 3.3
UD (H-3 only)	Deposition velocity	P	2	S	m/s	0	ANL-EAD-03-01, Appendix G, Section G.3.2
DKSUS	Resuspension rate	P, B	1	D	s^{-1}	1.33E-09	Calculated from the NUREG-1720 recommended DandD resuspension factor of 9.6E-07 m^{-1}, deposition velocity, air exchange rate and room height (see Section 6.2 of DTBD-04-004)
H	Room height	P	2	D	m	3.89	Result of DTBD-04-004 sensitivity analysis
AREA	Room area	P	2	D	m^2	137	Result of DTBD-04-004 sensitivity analysis
LAMBDAT (building)	Air exchange rate	B	2	S	1/h	Truncated lognormal-n	NUREG/CR-6755, Section 3.2

RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

Parameter							
Name	**Description**	**Class[1]**	**Priority[2]**	**Treatment[3]**	**Units**	**Parameter Value**	**Basis for Parameter Selection**
Q12 and Q21; Q23 and Q32	Flow rate between rooms	B	3	D	m^3/h	0	This dose model contains only one receptor room
Q10 and Q01; Q20 and Q02; Q30 and Q03	Outdoor inflow and outflow	B, P	3	NA	m^3/h	Not used	Outdoor inflow is calculated from room volume and air exchange rate
RECEPTOR PARAMETERS							
ND	Number of receptors	B	3	D	-	1	This dose model contains only one receptor
DLVL	Receptor room	B	3	D	-	1	This dose model contains only one receptor room
DX	Receptor location (x, y, z)	B	3	D	m	5.85, 5.85, 1	Center of the room's floor
TWGHT	Receptor time fraction	B	3	D	-	1	NUREG/CR-5512, Vol. 3
BRTRATE	Receptor breathing/inhalation rate	M, B	2	S	m^3/d	Triangular distribution	NUREG/CR-6755, Appendix A
INGE2	Indirect ingestion rate	B	2	S	m^2/h	Loguniform distribution	NUREG/CR-6755, Appendix A
SOURCE PARAMETERS							
NS	Number of sources	P	3	D	-	1	Assumes contamination on the floor
Source 1 - Floor							
SLVL	Source room (also primary room)	P	3	D	-	1	This dose model contains only one room
STYPE	Source type	P	3	D	-	Volume	Source type selected for derivation of activated bulk material DCGLs
SDIR	Source direction	P	3	D	-	z	NUREG/CR-5512
SX	Source location (x, y, z)	P	3	D	m	5.85, 5.85, 0	X and Y distances are half of the square root of the room area derived from DTBD-04-004 sensitivity analysis
SAREA	Source area	P	2	D	m^2	137	Room area from derived from DTBD-04-004 sensitivity analysis
AIRFR	Air release fraction	B	2	S	-	Triangular distribution	NUREG/CR-6755, Appendix A

RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

Parameter							
Name	**Description**	**Class[1]**	**Priority[2]**	**Treatment[3]**	**Units**	**Parameter Value**	**Basis for Parameter Selection**
INGE1	Direct ingestion rate	B	2	D	g/h	3.45E-07	Calculated from the default ingestion rate of 1.1E-04 m^2/h in the NUREG/CR-5512 industrial worker building occupancy scenario. 3.45E-07 h^{-1} is 1.1E-04 m^2/h divided by the total contaminated area of 319 m^2.
RMVFR	Removable fraction	P, B	1	NA	-	Not used	Removable contamination is not assumed to be present on a volume source.
RF0	Source lifetime (also time for source removal)	P, B	2	NA	d	Not used	Removable contamination is not assumed to be present on a volume source.
RRF	Radon release fraction	P, B	3	NA	-	Not used	Radon exposure is not regulated by the NRC
RNUCACT	Radionuclide concentration/activity	P	2	D	pCi/g	1	Calculates a dose conversion factor in units of mrem/yr per pCi/g
NREGI0	Number of regions in volume source	P	3	D	-	1	One homogenous region is assumed for the activated concrete and rebar
FCONT0	Contaminated region (volume source)	P	3	D	-	1	One homogenous region is assumed for the activated concrete and rebar
THICK0	Source region thickness (volume source)	P	2	D	cm	30.48	Assumed maximum depth of neutron activation or contamination
DENSI0	Source density (volume source)	P	1	S	g/cm^3	Uniform distribution	ANL-EAD-03-01, Appendix J
EROS0	Source erosion rate (volume source)	P, B	2	S	cm/d	Triangular distribution	ANL-EAD-03-01, Appendix J
POROS0	Source porosity	P	2	S	-	Uniform distribution	ANL-EAD-03-01, Appendix J
EFDIF0	Radon effective diffusion coefficient	P	3	NA	m^2/sec	Not used	Radon exposure is not regulated by the NRC
EMANA0	Radon emanation fraction	P	3	NA	-	Not used	Radon exposure is not regulated by the NRC
MTLS	Source material			D	-	Concrete	One homogenous region is assumed for the activated concrete and rebar

RESRAD-BUILD v3.3 Parameters for RSNGS Bulk Material Sensitivity Analysis – Industrial Worker Building Occupancy Scenario

Parameter							
Name	**Description**	**Class[1]**	**Priority[2]**	**Treatment[3]**	**Units**	**Parameter Value**	**Basis for Parameter Selection**
SHIELDING PARAMETERS							
DSTH	Shielding thickness	P, B	2	S	cm	0	Shielding is not used in this dose model
DSDEN	Shielding density	P	1	NA	g/cm^3	2.4	Default value but not used in this dose model
MTLC	Shielding material	P	3	NA	-	None	Default value but not used in this dose model
TRITIUM MODEL PARAMETERS							
DRYTHICK	Dry zone thickness	P	3	D	cm	0	This model assumes that all bulk material is contaminated
H3THICK	Wet + dry zone thickness	P	2	D	cm	30.48	This parameter represents the depth from the surface of the contaminated material to the deepest point of the contaminated zone, thus the source region thickness.
H3VOLFRACT	Volumetric water content	P	2	S	-	Uniform distribution	ANL-EAD-03-01, Appendix J
H3RMVF	Water fraction available for vaporization	P	2	S	-	Triangular distribution	ANL-EAD-03-01, Appendix J
HUMIDITY	Humidity	P, B	2	S	g/m^3	Uniform distribution	ANL-EAD-03-01, Appendix J

[1]Parameter Classification: P = Physical; B = Behavioral; M = Metabolic

[2]1 = high priority parameter, 2 = medium priority parameter, 3 = low priority parameter

[3]D = deterministic; S = stochastic; NA = not applicable

Attachment 8.3

Statistical Distribution Parameters for Sensitivity Analysis of Bulk Material and Sensitive Parameter Results –Industrial Worker Scenario

Table 8.3-1, Statistical Distribution Parameters for Sensitivity Analysis of Bulk Material and Sensitive Parameter Results – Industrial Worker Scenario

Parameter	Priority[1]	Distribution	Distribution's Statistical Parameters[2]				PRCC[3]	25% or 75% Quartile	Assigned Parameter Value
			1	2	3	4			
Deposition velocity	2	Loguniform	2.7E-06	2.7E-03	-	-	0.96	75%	4.78E-04
Deposition velocity - Pm-147	2	Loguniform	2.7E-06	2.7E-03	-	-	-0.18	25%	1.52E-05
Building air exchange rate	2	Truncated lognormal-n	0.4187	0.88	0.001	0.999	-0.97	25%	0.839
Receptor breathing/inhalation rate	2	Triangular	12	46	33.6	-	0.74	75%	35.7
Indirect ingestion rate	2	Loguniform	2.8E-05	2.9E-04	-	-	0.74	75%	1.61E-04
Indirect ingestion rate - Eu-154	2	Loguniform	2.8E-05	2.9E-04	-	-	-0.11	25%	5.02E-05
Air release fraction	2	Triangular	1E-06	1	0.07	-	0.80	75%	0.518
H-3 Air release fraction	2	Triangular	1E-06	1	0.07	-	-0.05	No	Distribution
Source density – H-3, C-14, Fe-55, Tc-99, Pm-147, Eu-155, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Pu-242, Cm-244	1	Uniform	2.2	2.6	-	-	0.16	75%	2.50
Source density – Na-22, Co-60, Sr-90, Nb-94, Ag-108m, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154	1	Uniform	2.2	2.6	-	-	-1.00	25%	2.30
Source erosion rate	2	Triangular	0.0	5.6E-07	0.0	-	0.88	75%	2.80E-07
H-3 Source porosity	2	Uniform	0.04	0.25	-	-	0.82	75%	0.197
H-3 Volumetric water content	2	Uniform	0.04	0.25	-	-	-0.70	25%	0.0923
H-3 Water fraction available for vaporization	2	Triangular	0.5	1.0	0.75	-	0.28	75%	0.823
H-3 Humidity	2	Uniform	6.5	13.1	-	-	-0.47	25%	8.13

Notes:

[1]1 = high priority parameter, 2 = medium priority parameter

[2]Distribution's Statistical Parameter
Loguniform: 1 = minimum, 2 = maximum
Triangular: 1 = minimum, 2 = maximum, 3 = most likely
Uniform: 1 = minimum, 2 = maximum
Truncated lognormal-n: 1 = underlying mean value, 2 = underlying standard deviation, 3 = lower quantile, 4 = upper quantile

[3]PRCC = Partial ranked correlation coefficient for Time 1

Table 8.3-2, Radionuclide Specific RESRAD-BUILD Bulk Material Sensitive Parameters												
	Radionuclide											
	H-3		C-14		Na-22		Fe-55		Ni-59		Co-60	
Rank	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC
1	LAMBDAT	-0.97	UD	0.92	DENSI0	-1.00	EROS0	0.88	EROS0	0.85	DENSI0	-0.98
2	POROS0	0.82	EROS0	0.83			AIRFR	0.85	LAMBDAT	-0.82		
3	BRTRATE	0.74	LAMBDAT	-0.80			LAMBDAT	-0.83	AIRFR	0.80		
4	H3VOLFRACT	-0.70	AIRFR	0.78			UD	0.44	UD	0.75		
5	HUMIDITY	-0.47	INGE2	0.49			BRTRATE	0.30	BRTRATE	0.23		
6	H3RMVF	0.28	BRTRATE	0.17			INGE2	0.19	INGE2	0.22		
7	DENSI0	0.16	DENSI0	0.12			DENSI0	0.16				
8												
	Radionuclide											
	Ni-63		Sr-90		Nb-94		Tc-99		Ag-108m		Sb-125	
Rank	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC
1	EROS0	0.85	EROS0	0.78	DENSI0	-1.00	EROS0	0.84	DENSI0	-1.00	DENSI0	-1.00
2	AIRFR	0.81	LAMBDAT	-0.74	UD	0.29	UD	0.83	UD	0.26		
3	LAMBDAT	-0.81	AIRFR	0.73	AIRFR	0.21	LAMBDAT	-0.81	AIRFR	0.20		
4	UD	0.75	UD	0.62	LAMBDAT	-0.19	AIRFR	0.79	LAMBDAT	-0.19		
5	INGE2	0.44	DENSI0	-0.55	EROS0	0.17	INGE2	0.29	EROS0	0.14		
6	BRTRATE	0.24	BRTRATE	0.22			BRTRATE	0.21				
7			INGE2	0.21			DENSI0	0.11				
8												
	Radionuclide											
	Cs-134		Cs-137		Pm-147		Eu-152		Eu-154		Eu-155	
Rank	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC
1	DENSI0	-1.00	DENSI0	-1.00	EROS0	0.89	DENSI0	-1.00	DENSI0	-0.99	DENSI0	0.67
2	LAMBDAT	-0.11	UD	0.41	AIRFR	0.86	EROS0	0.15	INGE2	-0.11	EROS0	0.57
3			LAMBDAT	-0.25	LAMBDAT	-0.84	AIRFR	0.12			LAMBDAT	-0.49
4			AIRFR	0.20	BRTRATE	0.42					AIRFR	0.46
5			INGE2	0.18	DENSI0	0.19					UD	0.22
6			EROS0	0.17	UD	-0.18						
7												
8												

Table 8.3-2, Radionuclide Specific Sensitive RESRAD-BUILD Bulk Material Sensitive Parameters, Cont.												
	Radionuclide											
	Np-237		Pu-238		Pu-239		Pu-240		Pu-241		Am-241	
Rank	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC
1	EROS0	0.89	EROS0	0.90	EROS0	0.89	EROS0	0.89	EROS0	0.90	EROS0	0.89
2	LAMBDAT	-0.87	LAMBDAT	-0.87	LAMBDAT	-0.87	LAMBDAT	-0.87	AIRFR	0.86	LAMBDAT	-0.87
3	AIRFR	0.86	AIRFR	0.86	AIRFR	0.86	AIRFR	0.86	LAMBDAT	-0.86	AIRFR	0.86
4	UD	0.41	BRTRATE	0.39	UD	0.41	UD	0.41	BRTRATE	0.42	UD	0.38
5	BRTRATE	0.36	UD	0.29	BRTRATE	0.37	BRTRATE	0.37	DENSI0	0.18	BRTRATE	0.37
6	DENSI0	0.14	DENSI0	0.16	DENSI0	0.13	DENSI0	0.14			DENSI0	0.14
7												
8												
	Radionuclide											
	Pu-242		Cm-244									
Rank	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC	Parameter	PRCC
1	EROS0	0.89	EROS0	0.90								
2	LAMBDAT	-0.87	AIRFR	0.87								
3	AIRFR	0.86	LAMBDAT	-0.86								
4	UD	0.41	BRTRATE	0.42								
5	BRTRATE	0.37	DENSI0	0.18								
6	DENSI0	0.14										
7												
8												

Parameter Code Explanation

AIRFR - Air release fraction
BRTRATE - Receptor breathing/inhalation rate
DENSI0 - Source density
EROS0 - Source erosion rate
H3RMV - Water fraction available for vaporization (for H-3)
H3VOLFRACT - Volumetric water content (for H-3)
HUMIDITY - Humidity (for H-3)
INGE2 - Indirect ingestion rate
LAMBDAT - Building air exchange rate
POROS0 - Source porosity (for H-3)
UD - Deposition velocity
(S#) Source number

Attachment 8.4

RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Analysis of Bulk Material Parameter Sensitivity Analysis

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

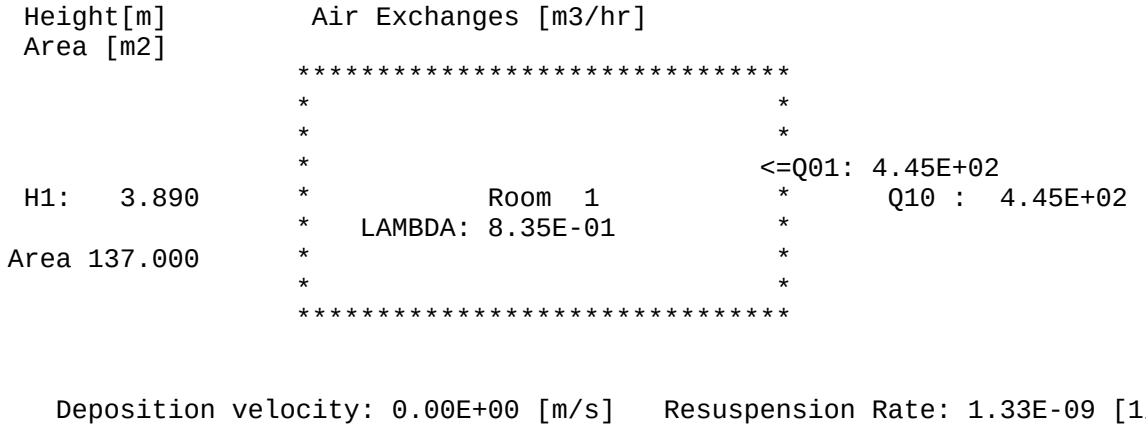
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for H-3
 Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 0.00E+00 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for H-3
 Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Tritium Volume Parameters ::

Total Thickness:	3.048E+01 [cm]
Dry Thickness:	0.000E+00 [cm]
Volumetric Water Content:	3.000E-02
Wall Total Porosity:	1.000E-01
Volatization Fraction:	1.000E+00
Wall Density:	2.400E+00 [gm/cm3]
Humidity:	8.000E+00 [gm/m3]
Erosion rate:	2.400E-08 [cm/d]
Direct Ingestion Rate:	3.450E-07 [gm/hr]
Fraction released to air:	1.000E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
H-3	1.000E+00	6.400E-08	6.400E-08	3.866E-08

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
2	BRTRATE(1)	TRIANGULAR	12	33.6	46	
3	INGE2(1)	LOGUNIFORM	.000028	.00029		
4	AIRFR(1)	TRIANGULAR	.000001	.07	1	
5	H3VOLFRACT(1)	UNIFORM	.04	.25		
6	H3RMVF(1)	TRIANGULAR	.5	.75	1	
7	H3POROSITY(1)	UNIFORM	.04	.25		
8	WALL_DENSITY(1)	UNIFORM	2.2	2.6		
9	HUMIDITY(1)	UNIFORM	6.5	13.1		
10	EROS0(1,1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

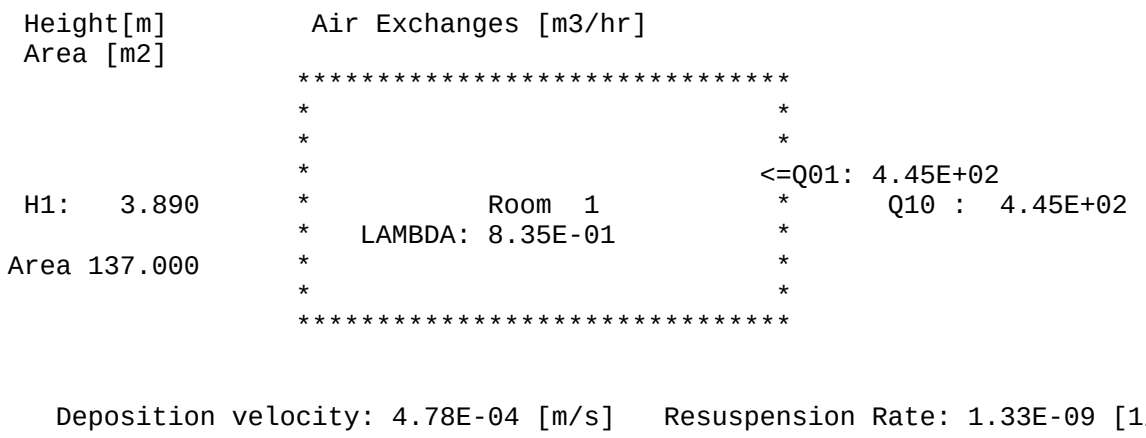
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
C-14	1.000E+00	2.090E-06	2.090E-06	2.616E-08

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	UD	LOGUNIFORM	.0000027	.0027	
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001 .999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46
4	INGE2(1)	LOGUNIFORM	.000028	.00029	
5	AIRFR(1)	TRIANGULAR	.000001	.07	1
6	DENSI0(1, 1)	UNIFORM	2.2	2.6	
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7

 Title : Volumetric Sensitivity for Na-22
 Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

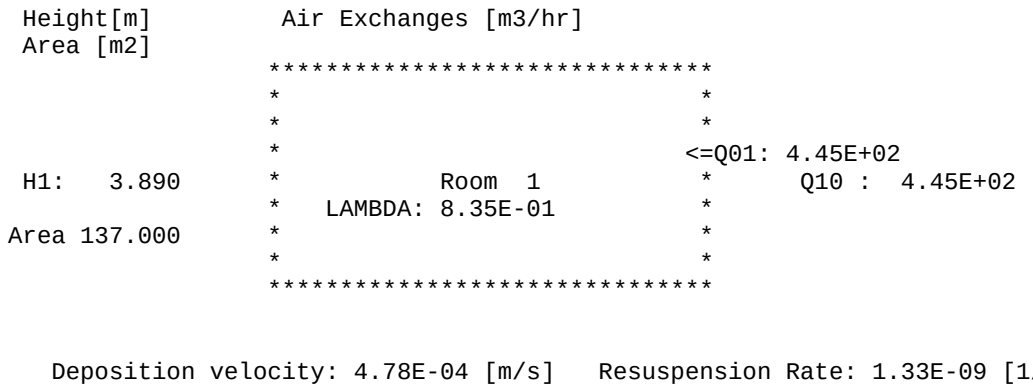
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Na-22
 Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActSens.bld

```
             ========  Source Information  ========


 Source:  1
         Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
         Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
         Pathway ::
              Direct Ingestion Rate:    3.450E-07 [gm/hr]
              Fraction released to air: 1.000E-01



         Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.40E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.40E-08
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/(pCi/m3)]
NA-22	1.000E+00	1.150E-05	7.660E-06	1.261E-02

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	UD	LOGUNIFORM	.0000027	.0027	
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001 .999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46
4	INGE2(1)	LOGUNIFORM	.000028	.00029	
5	AIRFR(1)	TRIANGULAR	.000001	.07	1
6	DENSI0(1, 1)	UNIFORM	2.2	2.6	
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7

 Title : Volumetric Sensitivity for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

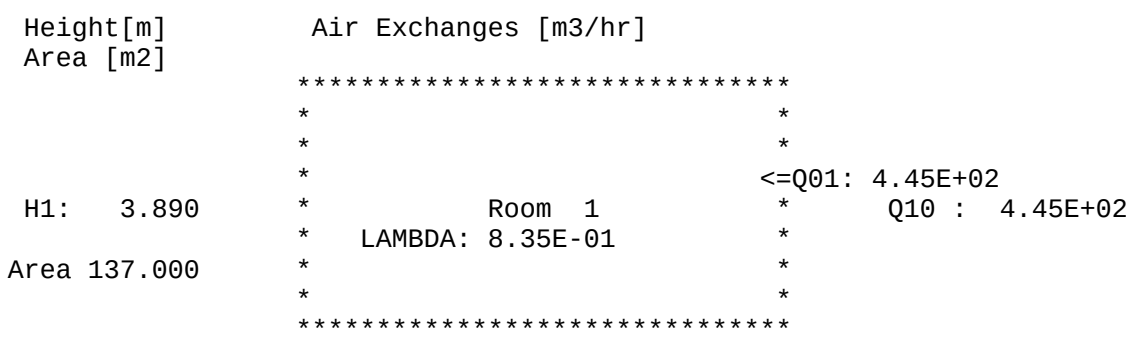
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration [pCi/g]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
FE-55	1.000E+00	6.070E-07	2.690E-06	0.000E+00

Title   : Volumetric Sensitivity for Fe-55
Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActSens.bld

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Ni-59
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

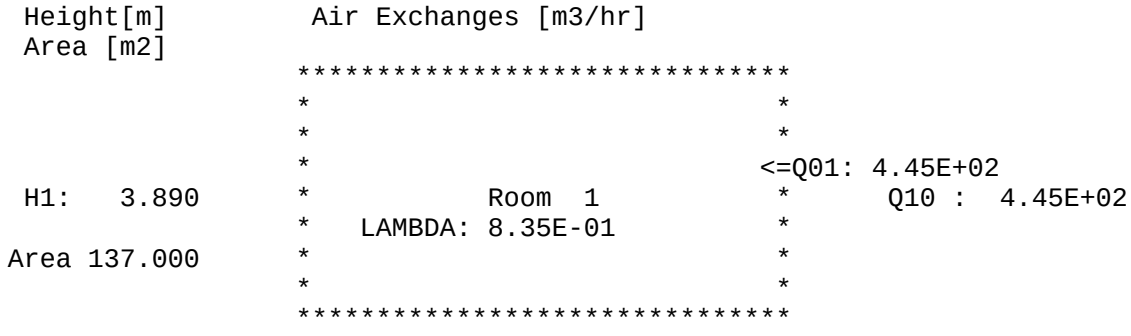
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Ni-59
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Ni-59
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NI-59	1.000E+00	2.100E-07	2.700E-06	0.000E+00

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

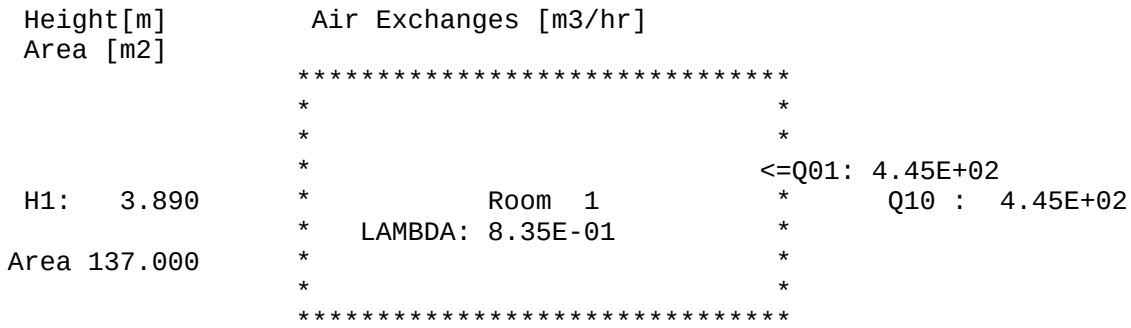
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume   Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment ::   Number of Regions: 1 Contaminated Region: 1
Region   :   1
Thickness [cm]   :3.05E+01
Density [g/cm3]   :2.40E+00
Material   :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CO-60	1.000E+00	2.690E-05	2.190E-04	1.472E-02

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric DCGL for Ni-63
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

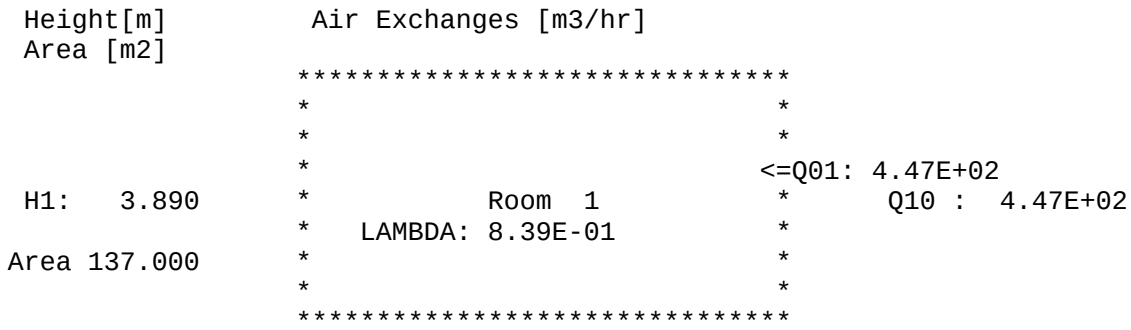
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Ni-63
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Ni-63
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 5.180E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.40E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.80E-07
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
NI-63	1.000E+00	5.770E-07	6.290E-06	0.000E+00

Title : Volumetric DCGL for Ni-63
Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	DENSI0(1, 1)	UNIFORM	2.2	2.6		
2	UD	LOGUNIFORM	.0000027	.0027		
3	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
4	BRTRATE(1)	TRIANGULAR	12	33.6	46	
5	INGE2(1)	LOGUNIFORM	.000028	.00029		
6	AIRFR(1)	TRIANGULAR	.000001	.07	1	
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

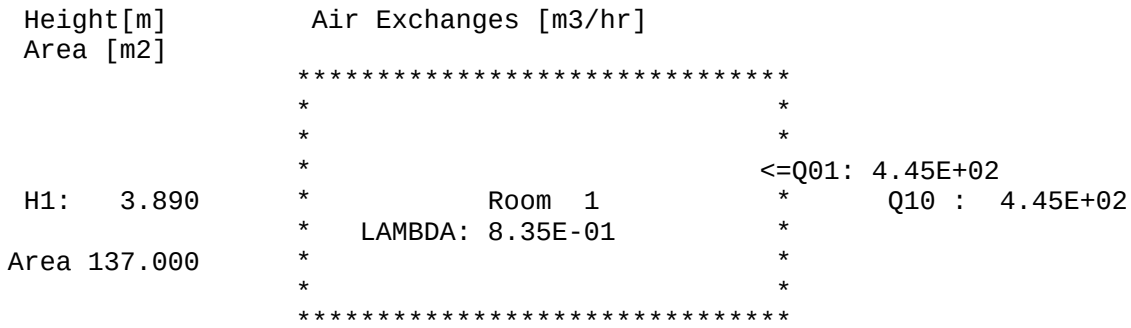
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
SR-90	1.000E+00	1.528E-04	1.308E-03	2.307E-05

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

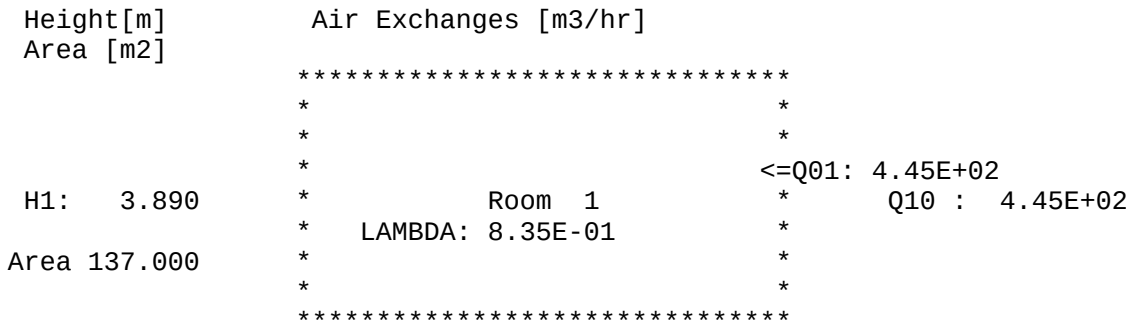
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
NB-94	1.000E+00	7.140E-06	4.140E-04	8.994E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

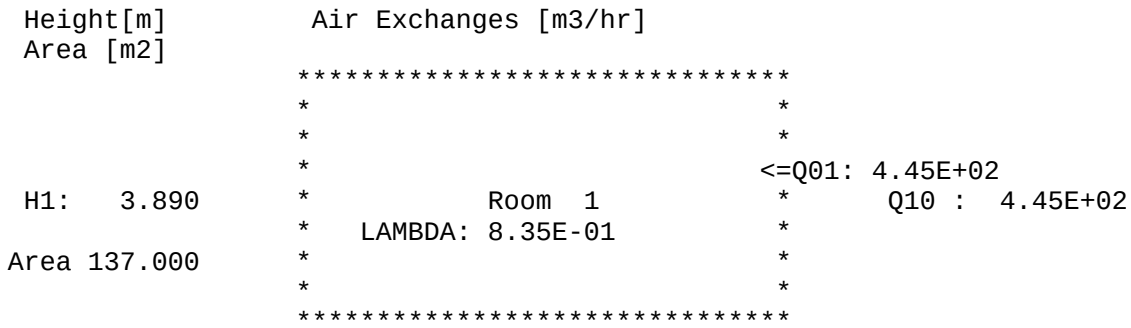
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActSens.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 1.000E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.40E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.40E-08
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
TC-99	1.000E+00	1.460E-06	8.320E-06	1.892E-07

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Ag-108m
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

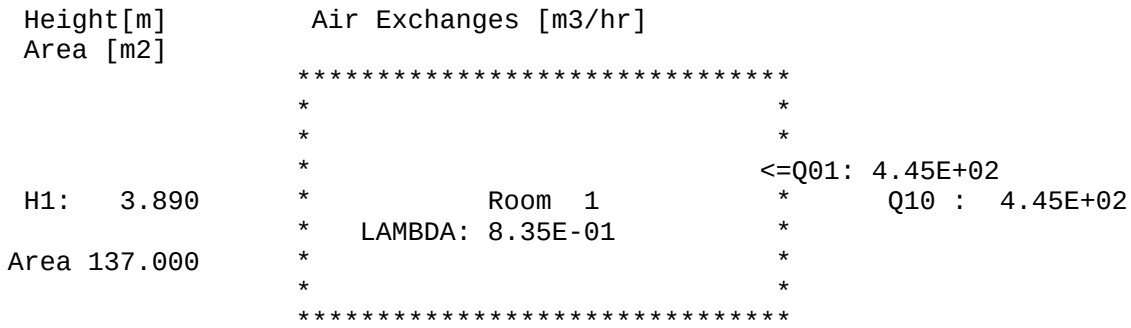
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Ag-108m
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Ag-108m
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
AG-108M	1.000E+00	7.620E-06	2.830E-04	9.120E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Sb-125
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

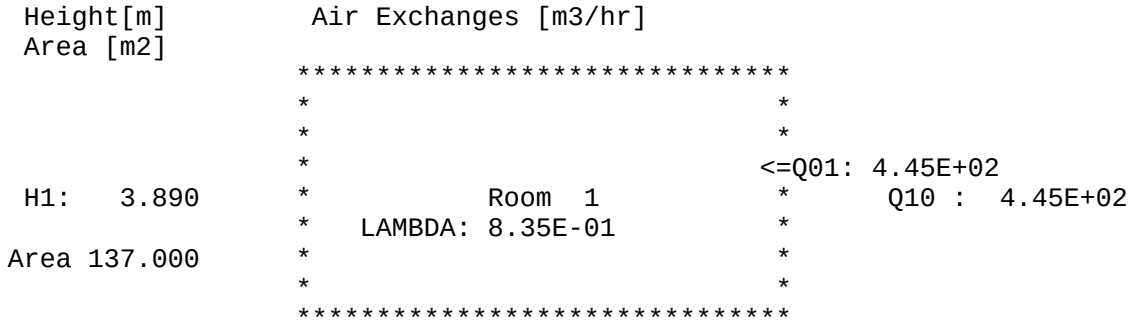
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Sb-125
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Sb-125
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
SB-125	1.000E+00	2.810E-06	1.220E-05	2.359E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Cs-134
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

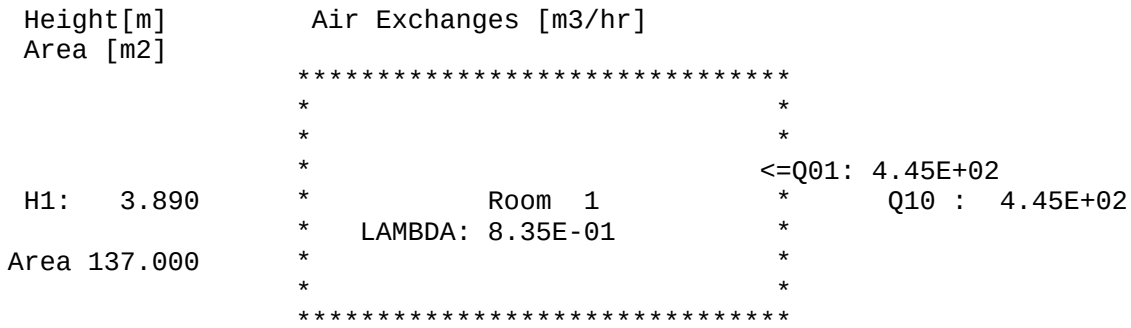
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Cs-134
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Cs-134
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActSens.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 1.000E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.40E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.40E-08
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CS-134	1.000E+00	7.330E-05	4.620E-05	8.842E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Cs-137
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

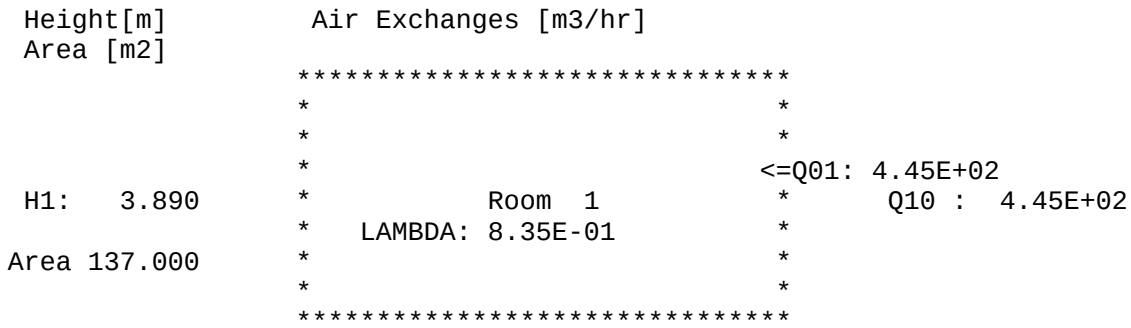
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Cs-137
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Cs-137
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActSens.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 1.000E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.40E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.40E-08
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CS-137	1.000E+00	5.000E-05	3.190E-05	3.183E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

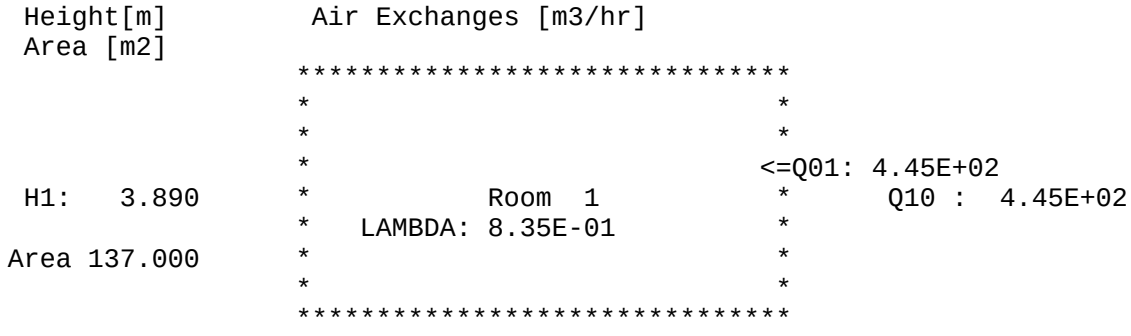
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pm-147
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pm-147
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
SM-147	0.000E+00	1.850E-04	7.470E-02	0.000E+00
PM-147	1.000E+00	1.050E-06	3.920E-05	8.094E-08

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Eu-152
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

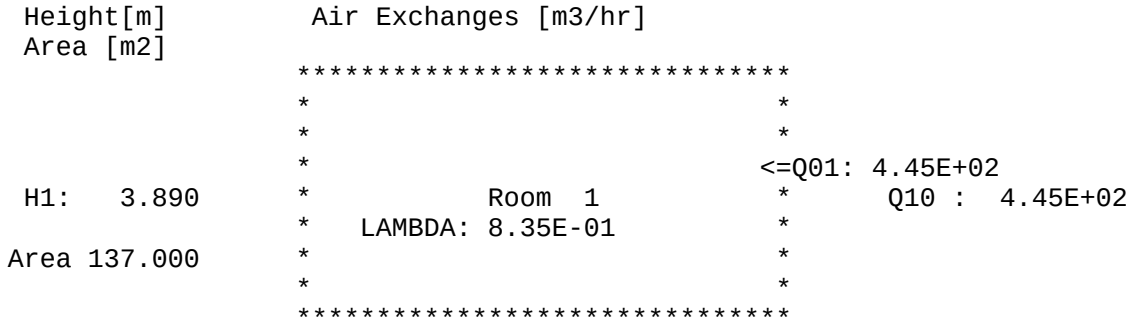
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Eu-152
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Eu-152
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/(pCi/m3)]
GD-152	0.000E+00	1.610E-04	2.430E-01	0.000E+00
EU-152	1.000E+00	6.480E-06	2.210E-04	6.599E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

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=== ===
=== RESRAD-BUILD Input Parameters ===
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Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

========== Receptor Information ==========

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

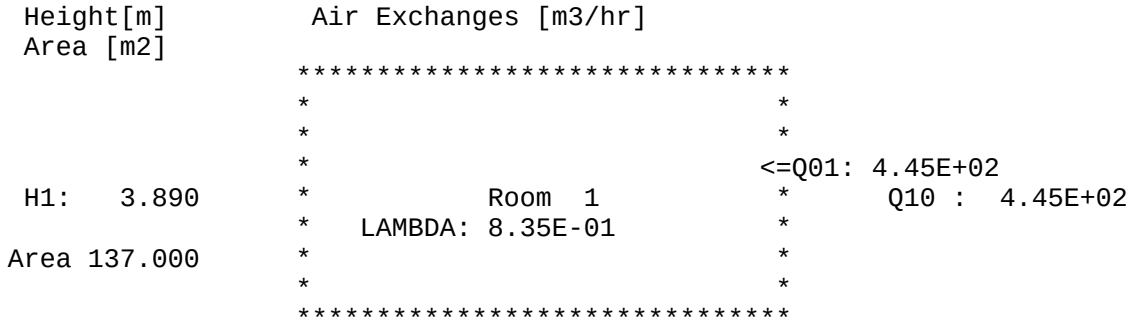
=== Receptor-Source Shielding Relationship ===

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Eu-154
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Eu-154
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E+00	9.550E-06	2.860E-04	7.172E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	UD	LOGUNIFORM	.0000027	.0027	
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001 .999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46
4	INGE2(1)	LOGUNIFORM	.000028	.00029	
5	AIRFR(1)	TRIANGULAR	.000001	.07	1
6	DENSI0(1, 1)	UNIFORM	2.2	2.6	
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

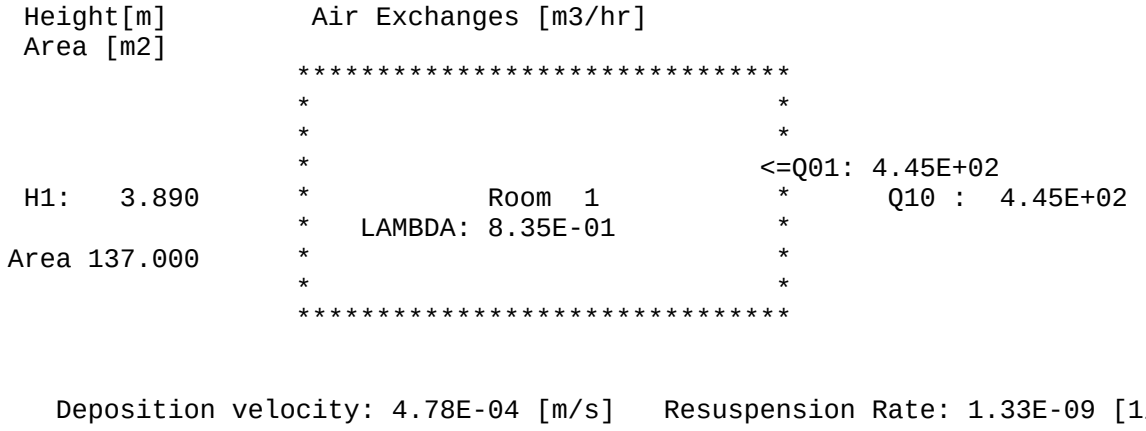
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete
1	2	2.40E+00	0.00E+00	Concrete
1	3	2.40E+00	0.00E+00	Concrete
1	4	2.40E+00	0.00E+00	Concrete
1	5	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Eu-155
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Eu-155
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-155	1.000E+00	1.530E-06	4.140E-05	2.908E-04

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Np-237
 Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

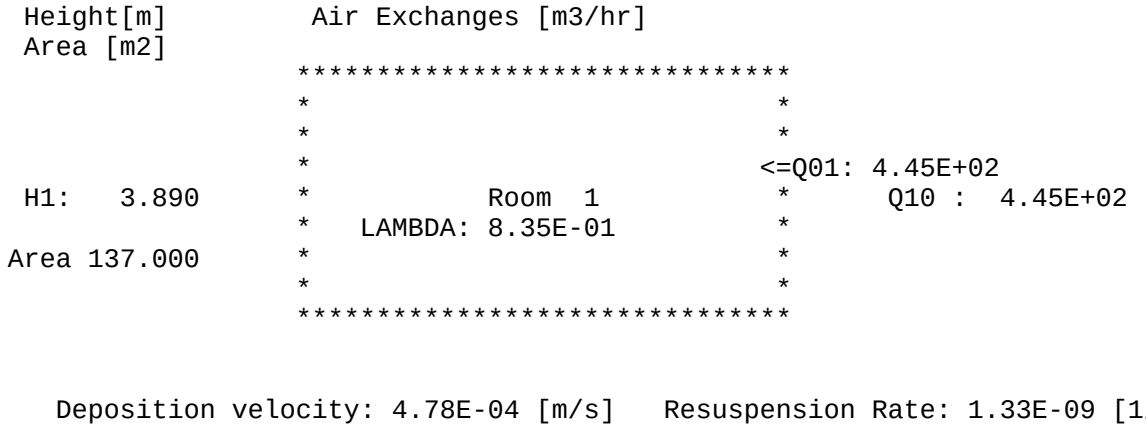
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Np-237
 Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NP-237	1.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

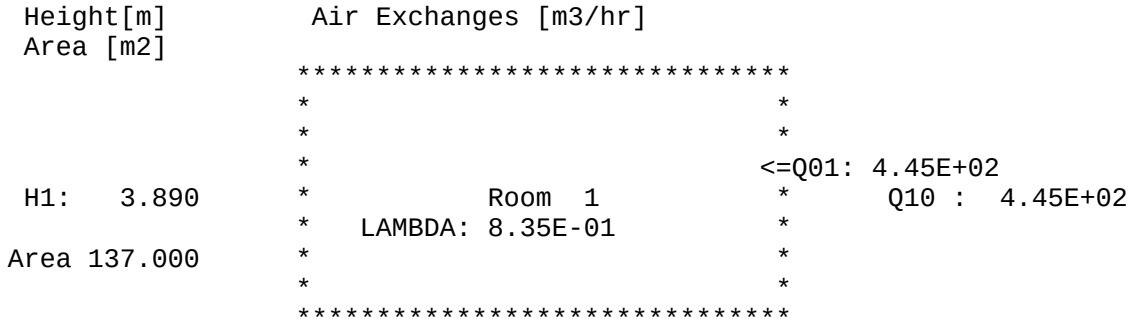
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pu-238
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pu-238
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.40E+00
Material	Concrete
Erosion Rate [cm/day]	2.40E-08
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-238	1.000E+00	3.200E-03	3.920E-01	5.700E-07
U-234	0.000E+00	2.830E-04	1.320E-01	8.912E-07
TH-230	0.000E+00	5.480E-04	3.260E-01	2.032E-06
RA-226	0.000E+00	1.321E-03	8.594E-03	1.035E-02
PB-210	0.000E+00	5.376E-03	1.380E-02	1.043E-05

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

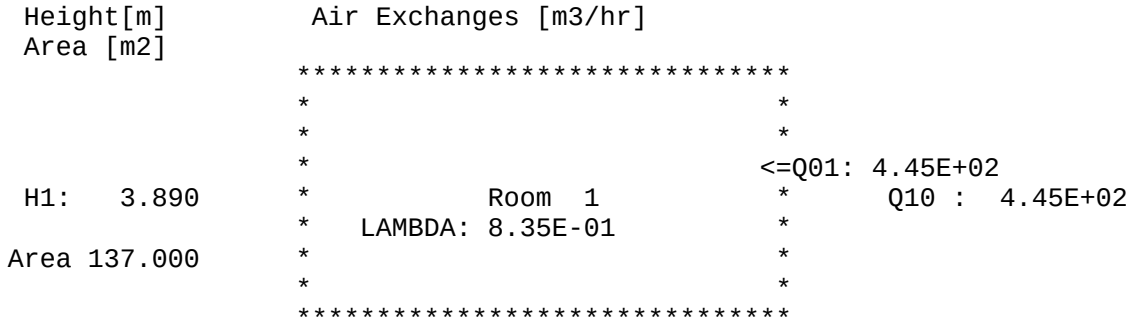
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pu-239
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pu-239
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-239	1.000E+00	3.540E-03	4.290E-01	4.952E-07
U-235	0.000E+00	2.673E-04	1.230E-01	9.019E-04
PA-231	0.000E+00	1.060E-02	1.280E+00	2.009E-04
AC-227	0.000E+00	1.480E-02	6.724E+00	2.161E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

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=== ===
=== RESRAD-BUILD Input Parameters ===
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Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

========== Receptor Information ==========

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

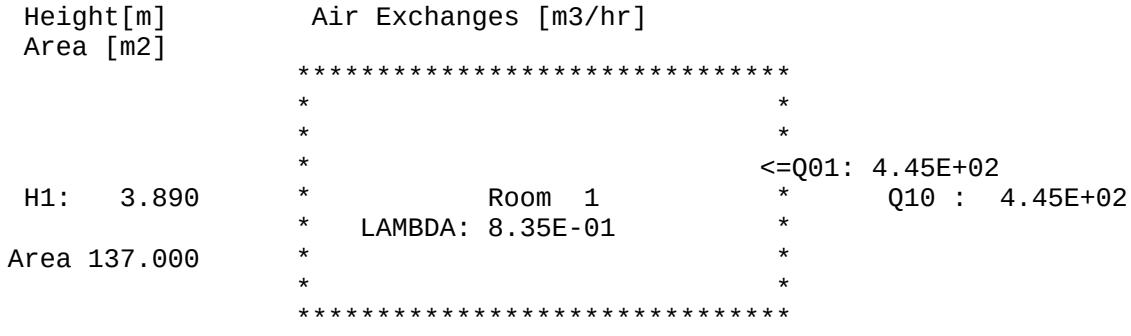
=== Receptor-Source Shielding Relationship ===

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pu-240
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pu-240
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.40E+00
Material	Concrete
Erosion Rate [cm/day]	2.40E-08
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-240	1.000E+00	3.540E-03	4.290E-01	5.548E-07
U-236	0.000E+00	2.690E-04	1.250E-01	5.852E-07
TH-232	0.000E+00	2.730E-03	1.640E+00	1.018E-06
TH-228	0.000E+00	8.086E-04	3.454E-01	9.378E-03
RA-228	0.000E+00	1.442E-03	5.078E-03	5.583E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

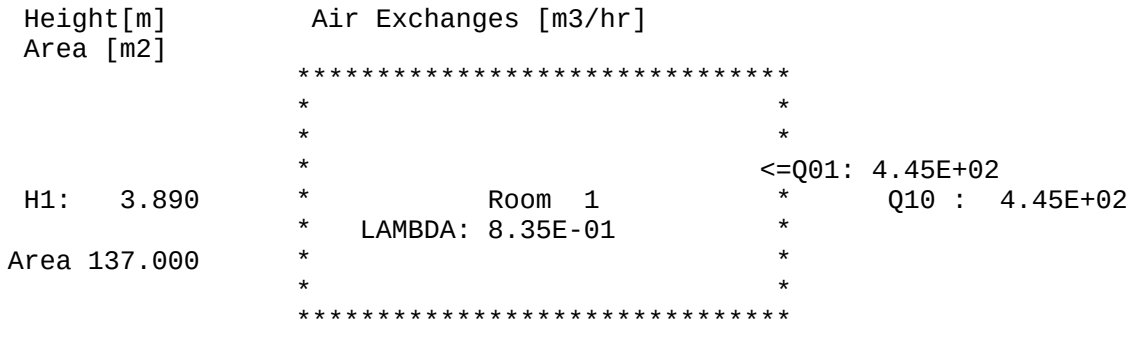
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-241	1.000E+00	6.840E-05	8.250E-03	2.555E-08
AM-241	0.000E+00	3.640E-03	4.440E-01	9.554E-05
NP-237	0.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Am-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Am-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Am-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration [pCi/g]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
AM-241	1.000E+00	3.640E-03	4.440E-01	9.554E-05
NP-237	0.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

==========
==========
=== ===
=== RESRAD-BUILD Input Parameters ===
=== ===
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==========

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

========== Receptor Information ==========

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

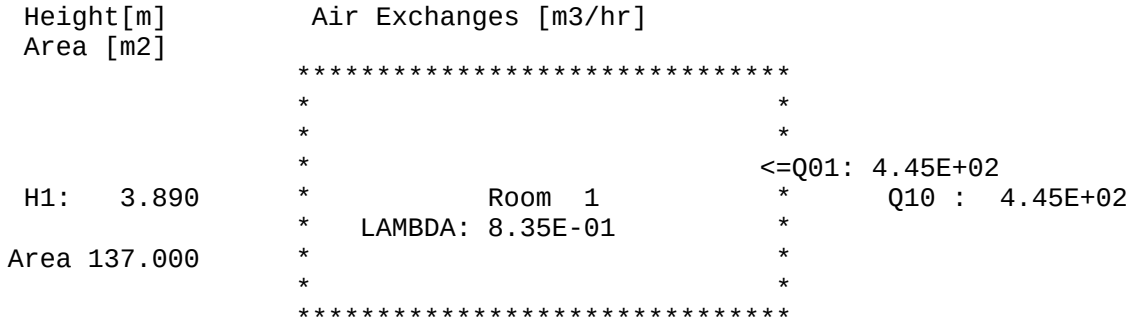
=== Receptor-Source Shielding Relationship ===

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Pu-242
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Pu-242
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.40E+00
Material	Concrete
Erosion Rate [cm/day]	2.40E-08
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-242	1.000E+00	3.360E-03	4.110E-01	4.684E-07
U-238	0.000E+00	2.687E-04	1.180E-01	1.597E-04
U-234	0.000E+00	2.830E-04	1.320E-01	8.912E-07
TH-230	0.000E+00	5.480E-04	3.260E-01	2.032E-06
RA-226	0.000E+00	1.321E-03	8.594E-03	1.035E-02
PB-210	0.000E+00	5.376E-03	1.380E-02	1.043E-05

Title   : Volumetric Sensitivity for Pu-242
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActSens.bld

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

 Title : Volumetric Sensitivity for Cm-244
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActSens.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

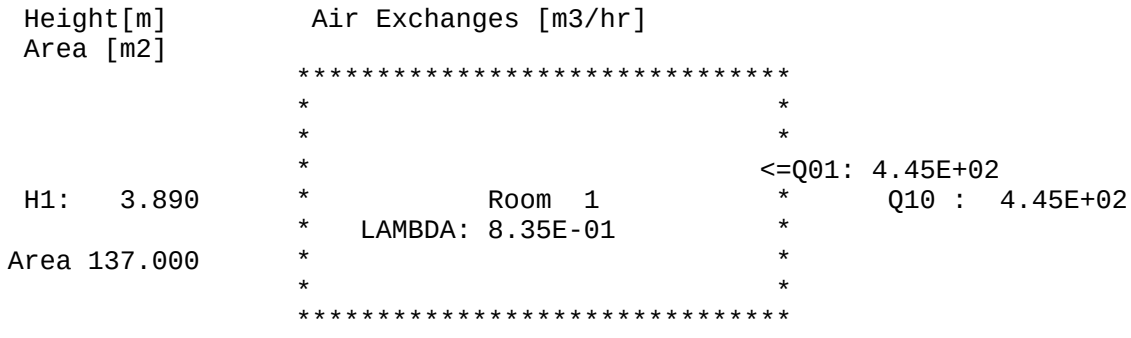
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric Sensitivity for Cm-244
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActSens.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric Sensitivity for Cm-244
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActSens.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.40E+00
Material	Concrete
Erosion Rate [cm/day]	2.40E-08
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CM-244	1.000E+00	2.020E-03	2.480E-01	5.735E-07
PU-240	0.000E+00	3.540E-03	4.290E-01	5.548E-07
U-236	0.000E+00	2.690E-04	1.250E-01	5.852E-07
TH-232	0.000E+00	2.730E-03	1.640E+00	1.018E-06
TH-228	0.000E+00	8.086E-04	3.454E-01	9.378E-03
RA-228	0.000E+00	1.442E-03	5.078E-03	5.583E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		
5	AIRFR(1)	TRIANGULAR	.000001	.07	1	
6	DENSI0(1, 1)	UNIFORM	2.2	2.6		
7	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

Attachment 8.5

RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Parameter Sensitivity Results for Bulk Material Parameter Sensitivity Analysis

Title : Volumetric Sensitivity for H-3
Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Building Exchange Rate	1	-0.97
Breathing Rate of receptor 1	3	0.74
Receptor Ingestion Rate of receptor 1	8	-0.04
Air fraction of 1	9	-0.01
Volumetric water content of 1	4	-0.70
Water fraction available for evaporation of 1	6	0.28
Total porosity of contaminated material of 1	2	0.82
Density of material of 1	7	0.16
Humidity of 1	5	-0.47
Erosion rate of 1	10	0.00
R-SQUARE		0.96

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for C-14
Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	1	0.92
Building Exchange Rate	3	-0.80
Breathing Rate of receptor 1	6	0.17
Receptor Ingestion Rate of receptor 1	5	0.49
Air fraction of 1	4	0.78
Density of region 1 of source 1	7	0.12
Erosion rate of region 1 of source 1	2	0.83
R-SQUARE		0.92

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title   : Volumetric Sensitivity for Na-22
Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.05
Building Exchange Rate	2	-0.09
Breathing Rate of receptor 1	3	0.08
Receptor Ingestion Rate of receptor 1	5	0.04
Air fraction of 1	7	-0.03
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	6	-0.03
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Fe-55
Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.44
Building Exchange Rate	3	-0.83
Breathing Rate of receptor 1	5	0.30
Receptor Ingestion Rate of receptor 1	6	0.19
Air fraction of 1	2	0.85
Density of region 1 of source 1	7	0.16
Erosion rate of region 1 of source 1	1	0.88
R-SQUARE		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Ni-59
Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.75
Building Exchange Rate	2	-0.82
Breathing Rate of receptor 1	5	0.23
Receptor Ingestion Rate of receptor 1	6	0.22
Air fraction of 1	3	0.80
Density of region 1 of source 1	7	0.09
Erosion rate of region 1 of source 1	1	0.85
R-SQUARE		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title   : Volumetric Sensitivity for Co-60
Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	5	0.03
Building Exchange Rate	2	0.05
Breathing Rate of receptor 1	6	0.01
Receptor Ingestion Rate of receptor 1	3	0.04
Air fraction of 1	7	0.00
Density of region 1 of source 1	1	-0.98
Erosion rate of region 1 of source 1	4	-0.04
R-SQUARE		0.96

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric DCGL for Ni-63
Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Density of region 1 of source 1	7	0.01
Deposition Velocity	4	0.75
Building Exchange Rate	3	-0.81
Breathing Rate of receptor 1	6	0.24
Receptor Ingestion Rate of receptor 1	5	0.44
Air fraction of 1	2	0.81
Erosion rate of region 1 of source 1	1	0.85
R-SQUARE		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Sr-90
Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig Coeff
Deposition Velocity	4 0.62
Building Exchange Rate	2 -0.74
Breathing Rate of receptor 1	6 0.22
Receptor Ingestion Rate of receptor 1	7 0.21
Air fraction of 1	3 0.73
Density of region 1 of source 1	5 -0.55
Erosion rate of region 1 of source 1	1 0.78
R-SQUARE	0.83

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Nb-94
Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	2	0.29
Building Exchange Rate	4	-0.19
Breathing Rate of receptor 1	6	-0.04
Receptor Ingestion Rate of receptor 1	7	-0.02
Air fraction of 1	3	0.21
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	5	0.17
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Tc-99
Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	2	0.83
Building Exchange Rate	3	-0.81
Breathing Rate of receptor 1	6	0.21
Receptor Ingestion Rate of receptor 1	5	0.29
Air fraction of 1	4	0.79
Density of region 1 of source 1	7	0.11
Erosion rate of region 1 of source 1	1	0.84
R-SQUARE		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Ag-108m
Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	2	0.26
Building Exchange Rate	4	-0.19
Breathing Rate of receptor 1	6	-0.05
Receptor Ingestion Rate of receptor 1	7	0.04
Air fraction of 1	3	0.20
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	5	0.14
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Sb-125
Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	3	0.04
Building Exchange Rate	7	-0.03
Breathing Rate of receptor 1	4	0.03
Receptor Ingestion Rate of receptor 1	6	-0.03
Air fraction of 1	2	-0.09
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	5	0.03
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Cs-134
Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.01
Building Exchange Rate	2	-0.11
Breathing Rate of receptor 1	3	0.01
Receptor Ingestion Rate of receptor 1	7	0.00
Air fraction of 1	6	-0.01
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	5	-0.01
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Cs-137
Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	2	0.41
Building Exchange Rate	3	-0.25
Breathing Rate of receptor 1	7	-0.08
Receptor Ingestion Rate of receptor 1	5	0.18
Air fraction of 1	4	0.20
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	6	0.17
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title   : Volumetric Sensitivity for Pm-147
Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	6	-0.18
Building Exchange Rate	3	-0.84
Breathing Rate of receptor 1	4	0.42
Receptor Ingestion Rate of receptor 1	7	-0.03
Air fraction of 1	2	0.86
Density of region 1 of source 1	5	0.19
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.90

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Eu-152
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	6	-0.03
Building Exchange Rate	4	-0.09
Breathing Rate of receptor 1	7	0.00
Receptor Ingestion Rate of receptor 1	5	0.03
Air fraction of 1	3	0.12
Density of region 1 of source 1	1	-1.00
Erosion rate of region 1 of source 1	2	0.15
R-SQUARE		1.00

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Eu-154
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	7	0.00
Building Exchange Rate	3	-0.08
Breathing Rate of receptor 1	4	-0.07
Receptor Ingestion Rate of receptor 1	2	-0.11
Air fraction of 1	5	0.07
Density of region 1 of source 1	1	-0.99
Erosion rate of region 1 of source 1	6	-0.04
R-SQUARE		0.99

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Eu-155
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	5	0.22
Building Exchange Rate	3	-0.49
Breathing Rate of receptor 1	6	0.10
Receptor Ingestion Rate of receptor 1	7	0.06
Air fraction of 1	4	0.46
Density of region 1 of source 1	1	0.67
Erosion rate of region 1 of source 1	2	0.57
R-SQUARE		0.66

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Np-237
Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.41
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	5	0.36
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.14
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Pu-238
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	5	0.29
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	4	0.39
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.16
Erosion rate of region 1 of source 1	1	0.90
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Pu-239
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.41
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	5	0.37
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.13
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Pu-240
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.41
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	5	0.37
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.14
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Pu-241
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1
Description of Probabilistic Variable	Sig Coeff
Deposition Velocity	6 -0.03
Building Exchange Rate	3 -0.86
Breathing Rate of receptor 1	4 0.42
Receptor Ingestion Rate of receptor 1	7 -0.02
Air fraction of 1	2 0.86
Density of region 1 of source 1	5 0.18
Erosion rate of region 1 of source 1	1 0.90
R-SQUARE	0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Am-241
Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.38
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	5	0.37
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.14
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Pu-242
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActSens.BLD

Coefficients for Total at Time: 1
Coefficient = PRCC
Repetition = 1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	4	0.41
Building Exchange Rate	2	-0.87
Breathing Rate of receptor 1	5	0.37
Receptor Ingestion Rate of receptor 1	7	0.02
Air fraction of 1	3	0.86
Density of region 1 of source 1	6	0.14
Erosion rate of region 1 of source 1	1	0.89
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Title : Volumetric Sensitivity for Cm-244
Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActSens.BLD

Coefficients for Total at Time: 1

Coefficient =	PRCC
Repetition =	1

Description of Probabilistic Variable	Sig	Coeff
Deposition Velocity	6	0.02
Building Exchange Rate	3	-0.86
Breathing Rate of receptor 1	4	0.42
Receptor Ingestion Rate of receptor 1	7	-0.02
Air fraction of 1	2	0.87
Density of region 1 of source 1	5	0.18
Erosion rate of region 1 of source 1	1	0.90
R-SQUARE		0.91

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Attachment 8.6

RESRAD-BUILD v3.3 Deterministic and Probabilistic Input Parameters for Derivation of Bulk Material Single Nuclide DCGLs

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

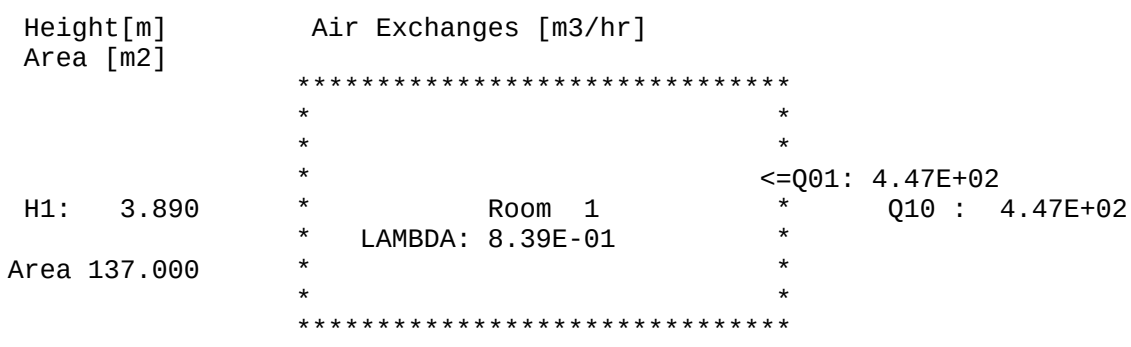
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for H-3
 Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 0.00E+00 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Tritium Volume Parameters ::
Total Thickness: 3.048E+01 [cm]
Dry Thickness: 0.000E+00 [cm]
Volumetric Water Content: 9.230E-02
Wall Total Porosity: 1.970E-01
Volatization Fraction: 8.230E-01
Wall Density: 2.500E+00 [gm/cm3]
Humidity: 8.130E+00 [gm/m3]
Erosion rate: 2.400E-08 [cm/d]
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
H-3	1.000E+00	6.400E-08	6.400E-08	3.866E-08

Title   : Volumetric DCGL for H-3
Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActDCGL.bld

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	AIRFR(1)	TRIANGULAR	.000001	.07	1
2	EROS0(1,1)	TRIANGULAR	0	0	5.6E-7
3	INGE2(1)	LOGUNIFORM	.000028	.00029	

 Title : Volumetric DCGL for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

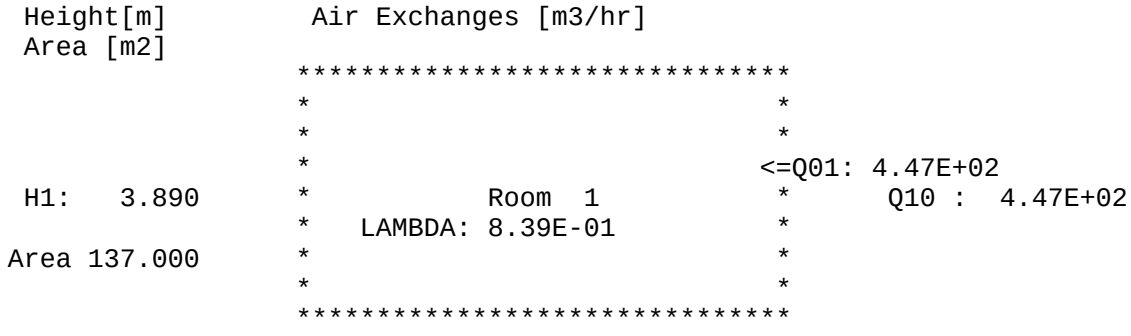
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.50E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
C-14	1.000E+00	2.090E-06	2.090E-06	2.616E-08

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

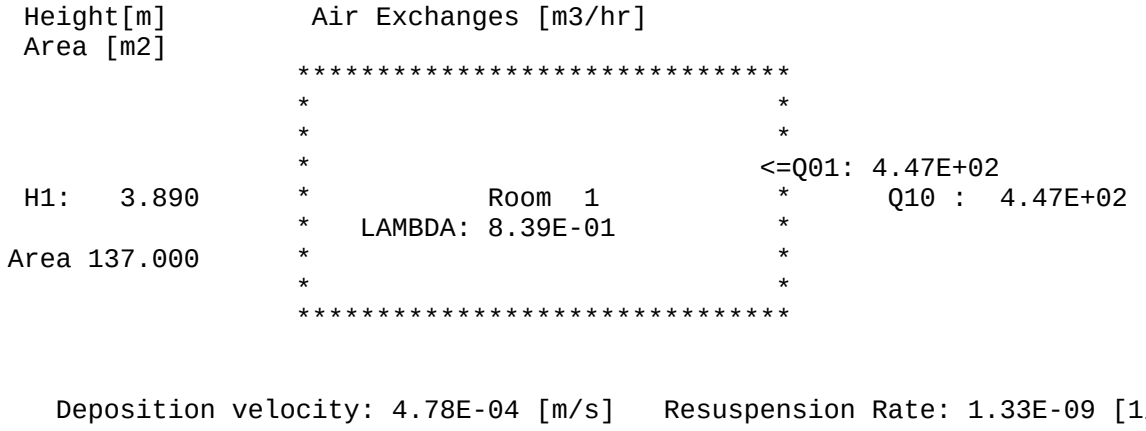
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Na-22
 Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Na-22
 Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.30E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NA-22	1.000E+00	1.150E-05	7.660E-06	1.261E-02

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	
3	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
4	AIRFR(1)	TRIANGULAR	.000001	.07	1	
5	INGE2(1)	LOGUNIFORM	.000028	.00029		
6	BRTRATE(1)	TRIANGULAR	12	33.6	46	

 Title : Volumetric DCGL for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

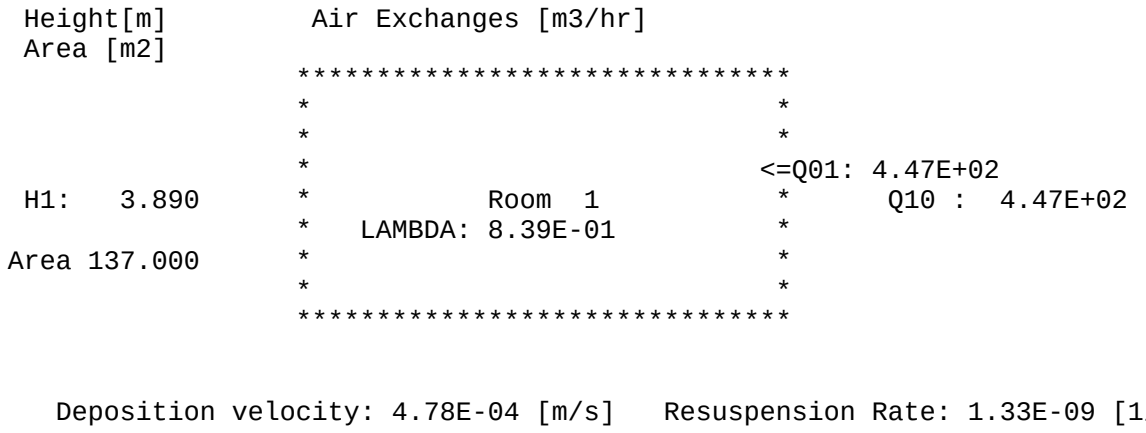
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.50E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
FE-55	1.000E+00	6.070E-07	2.690E-06	0.000E+00

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

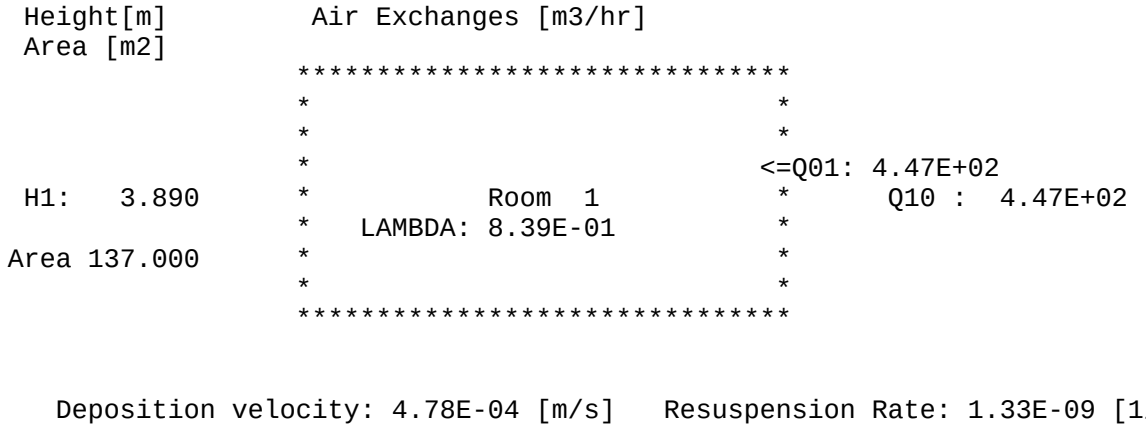
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Ni-59
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Ni-59
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.40E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration [pCi/g]	Dose Conversion Factor (Library: FGR 13 Morbidity Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/(pCi/m3)]
NI-59	1.000E+00	2.100E-07	2.700E-06	0.000E+00

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	DENSI0(1, 1)	UNIFORM	2.2 2.6

 Title : Volumetric DCGL for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

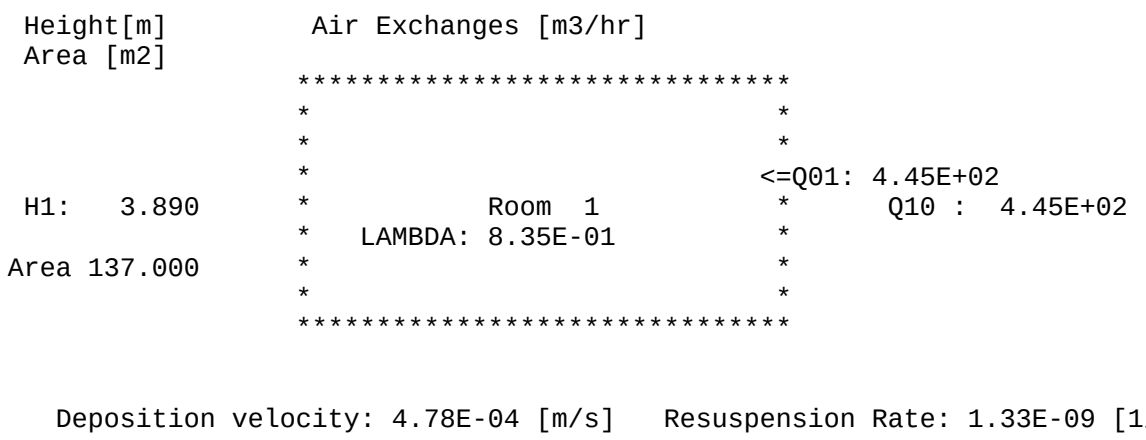
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Co-60
 Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.30E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.40E-08

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
CO-60	1.000E+00	2.690E-05	2.190E-04	1.472E-02

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
2	BRTRATE(1)	TRIANGULAR	12	33.6	46	
3	INGE2(1)	LOGUNIFORM	.000028	.00029		
4	AIRFR(1)	TRIANGULAR	.000001	.07	1	
5	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	
6	UD	LOGUNIFORM	.0000027	.0027		

 Title : Volumetric DCGL for Ni-63
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

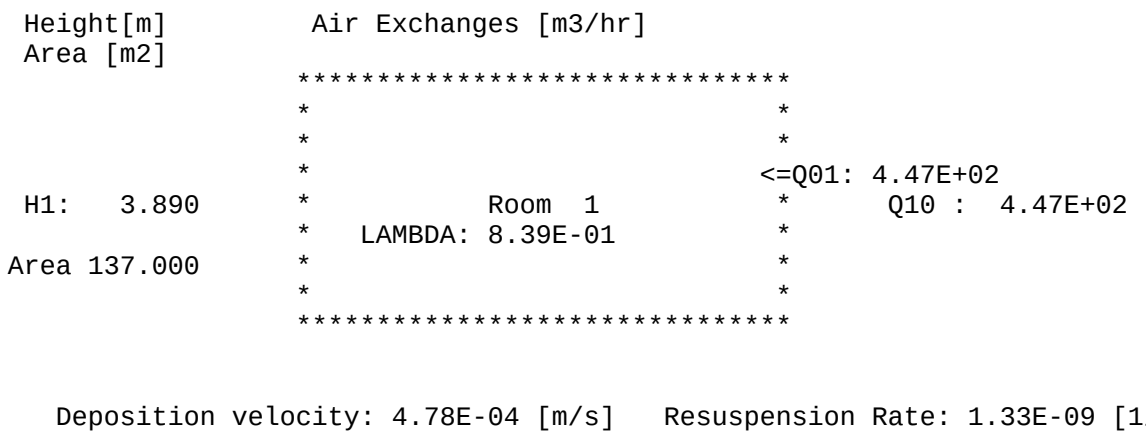
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Ni-63
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NI-63	1.000E+00	5.770E-07	6.290E-06	0.000E+00

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	DENSI0(1, 1)	UNIFORM	2.2 2.6

 Title : Volumetric DCGL for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

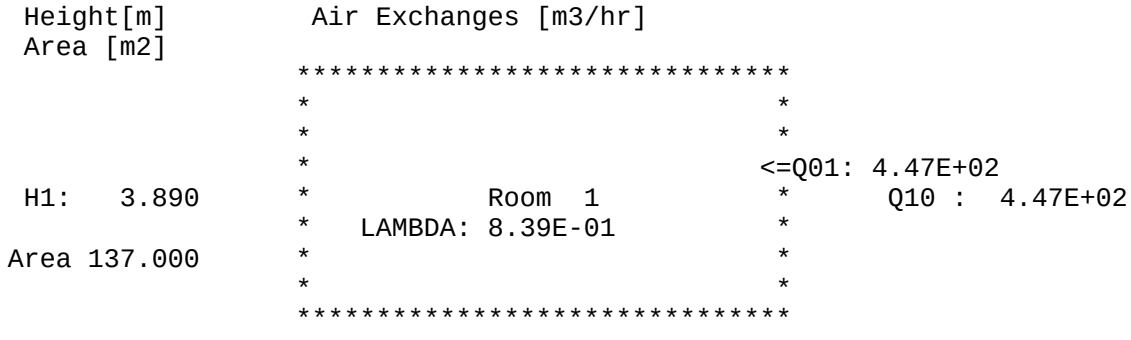
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.30E+00
Material	Concrete
Erosion Rate [cm/day]	2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
SR-90	1.000E+00	1.528E-04	1.308E-03	2.307E-05

 Title : Volumetric DCGL for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

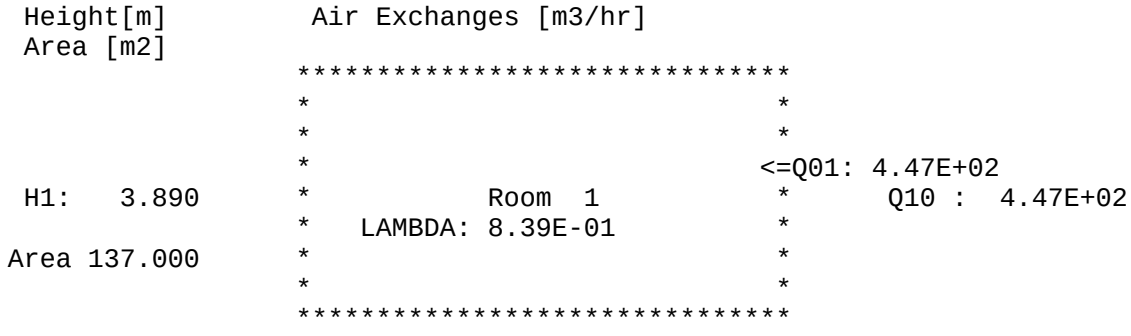
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Nb-94
 Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.30E+00
Material	Concrete
Erosion Rate [cm/day]	2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NB-94	1.000E+00	7.140E-06	4.140E-04	8.994E-03

Title : Volumetric DCGL for Nb-94
Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActDCGL.bld

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	BRTRATE(1)	TRIANGULAR	12	33.6	46
2	INGE2(1)	LOGUNIFORM	.000028	.00029	

 Title : Volumetric DCGL for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

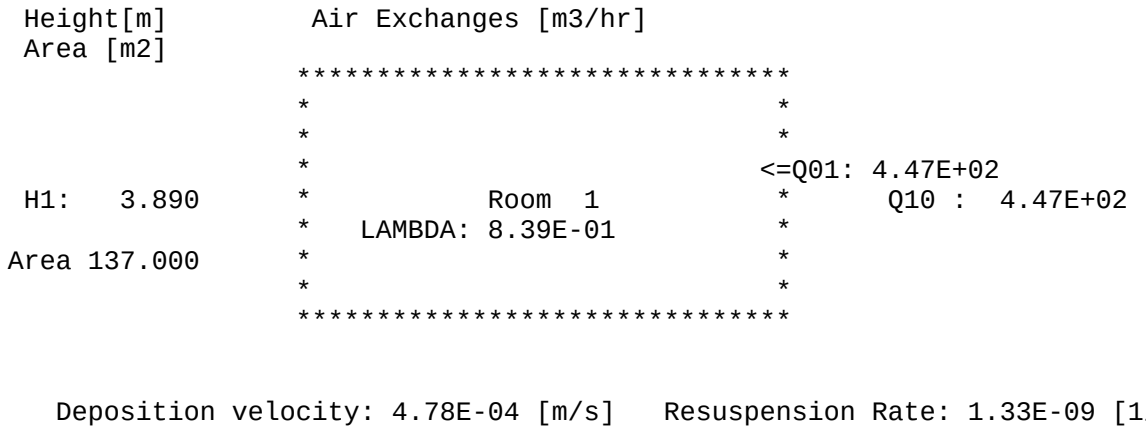
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.50E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
TC-99	1.000E+00	1.460E-06	8.320E-06	1.892E-07

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

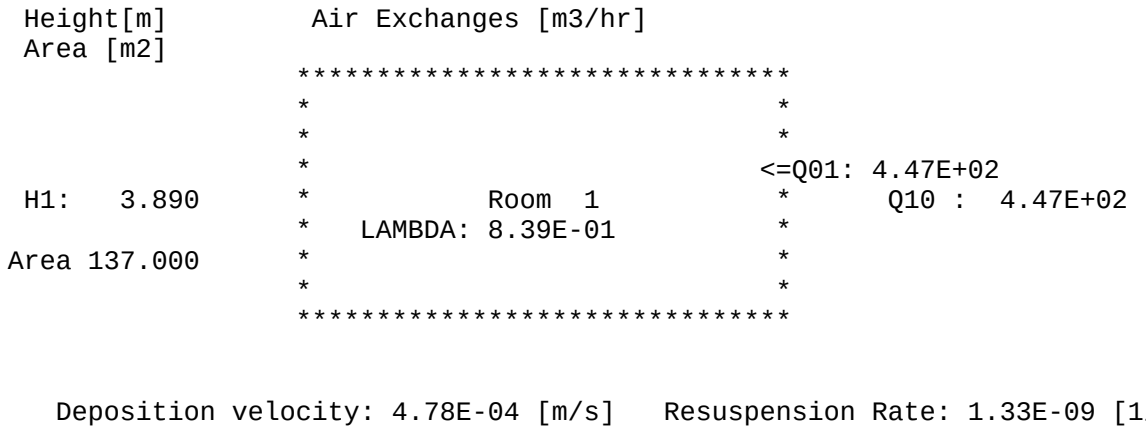
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Ag-108m
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Ag-108m
 Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActDCGL.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 5.180E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.30E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.80E-07
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
AG-108M	1.000E+00	7.620E-06	2.830E-04	9.120E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	BRTRATE(1)	TRIANGULAR	12	33.6	46
2	INGE2(1)	LOGUNIFORM	.000028	.00029	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

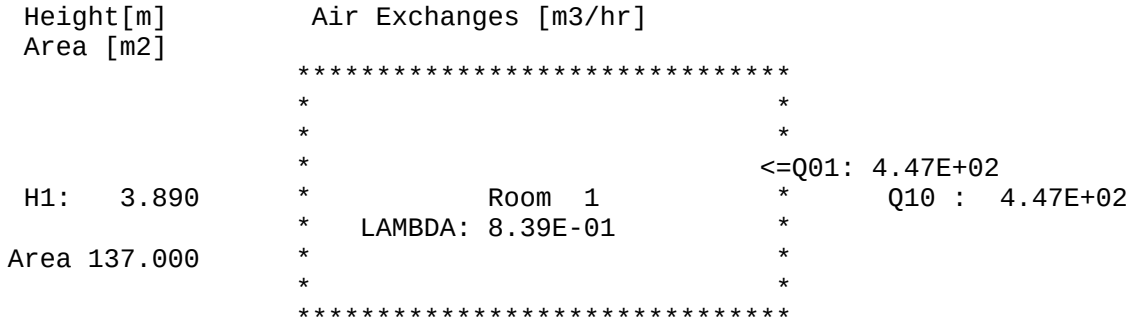
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Sb-125
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Sb-125
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActDCGL.bld

```
             ========  Source Information  ========


 Source:  1
        Location::  Room :  1  x:   5.85 y:   5.85  z:   0.00[m]
        Geometry::  Type: Volume      Area:1.37E+02 [m2]  Direction: z
        Pathway ::
             Direct Ingestion Rate:    3.450E-07 [gm/hr]
             Fraction released to air: 5.180E-01



        Containment ::   Number of Regions:  1 Contaminated Region:  1
     Region                 :    1
     Thickness [cm]         :3.05E+01
     Density [g/cm3]        :2.30E+00
     Material               :Concrete
     Erosion Rate [cm/day] :2.80E-07
```

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
SB-125	1.000E+00	2.810E-06	1.220E-05	2.359E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	BRTRATE(1)	TRIANGULAR	12	33.6	46	
2	INGE2(1)	LOGUNIFORM	.000028	.00029		
3	UD	LOGUNIFORM	.0000027	.0027		
4	AIRFR(1)	TRIANGULAR	.000001	.07	1	
5	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
6	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

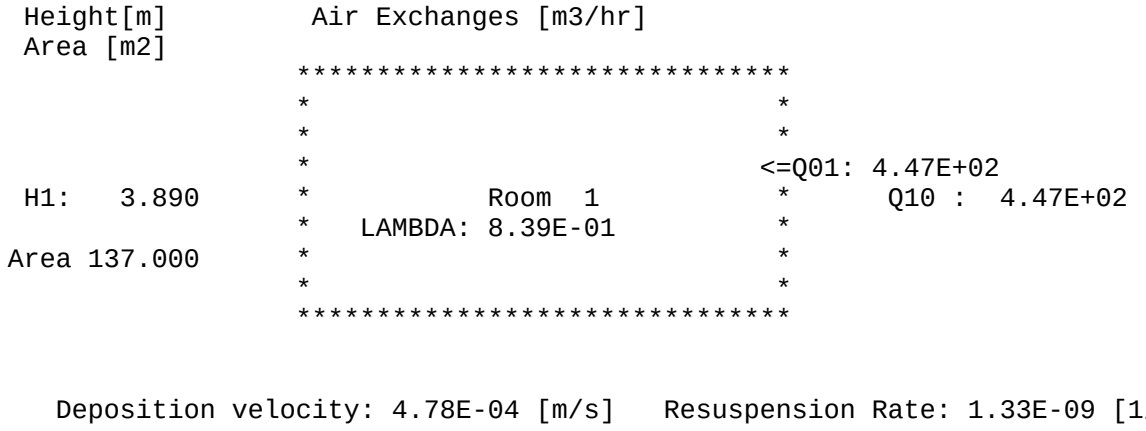
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Cs-134
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Cs-134
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.30E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
CS-134	1.000E+00	7.330E-05	4.620E-05	8.842E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	UD	LOGUNIFORM	.0000027	.0027	
2	BRTRATE(1)	TRIANGULAR	12	33.6	46
3	INGE2(1)	LOGUNIFORM	.000028	.00029	
4	AIRFR(1)	TRIANGULAR	.000001	.07	1
5	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.61E-04

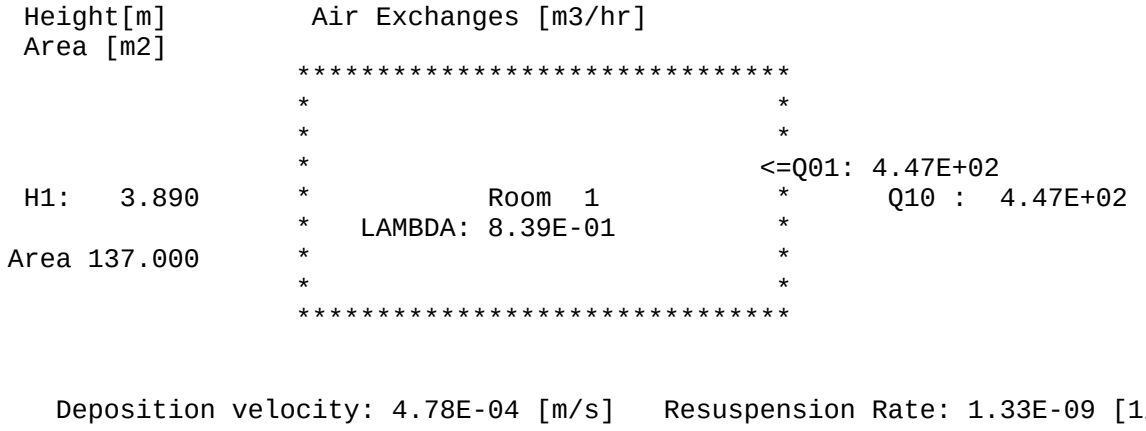
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Cs-137
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Cs-137
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.30E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CS-137	1.000E+00	5.000E-05	3.190E-05	3.183E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	BRTRATE(1)	TRIANGULAR	12 33.6 46

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

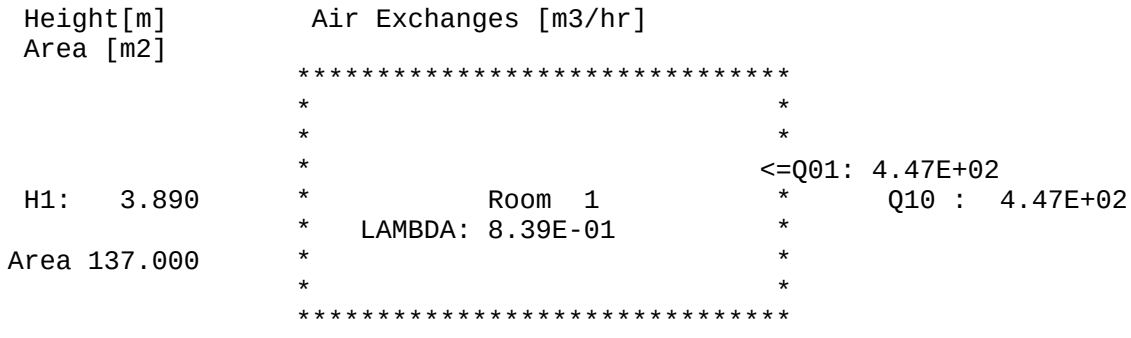
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pm-147
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 1.52E-05 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pm-147
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
SM-147	0.000E+00	1.850E-04	7.470E-02	0.000E+00
PM-147	1.000E+00	1.050E-06	3.920E-05	8.094E-08

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	1.00E-04

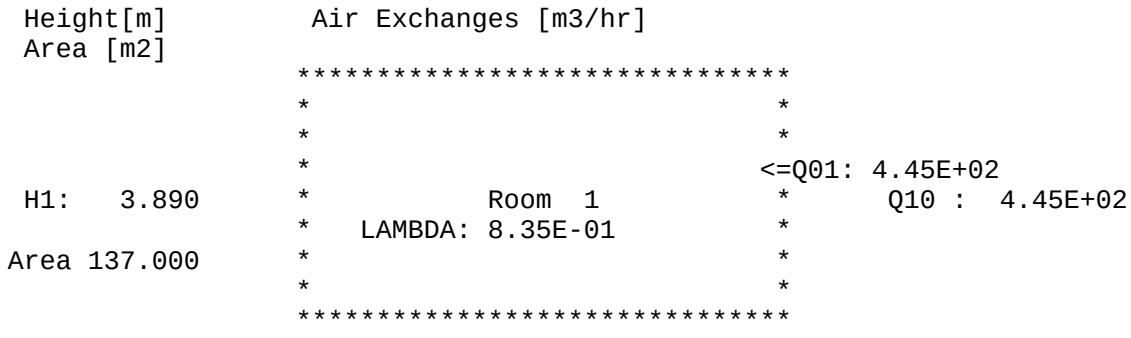
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Eu-152
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.35E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Eu-152
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.30E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
GD-152	0.000E+00	1.610E-04	2.430E-01	0.000E+00
EU-152	1.000E+00	6.480E-06	2.210E-04	6.599E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	UD	LOGUNIFORM	.0000027	.0027		
2	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
3	BRTRATE(1)	TRIANGULAR	12	33.6	46	
4	INGE2(1)	LOGUNIFORM	.000028	.00029		

==========
==========
=== ===
=== RESRAD-BUILD Input Parameters ===
=== ===
==========
==========

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

========== Receptor Information ==========

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	1.80E+01	5.02E-05

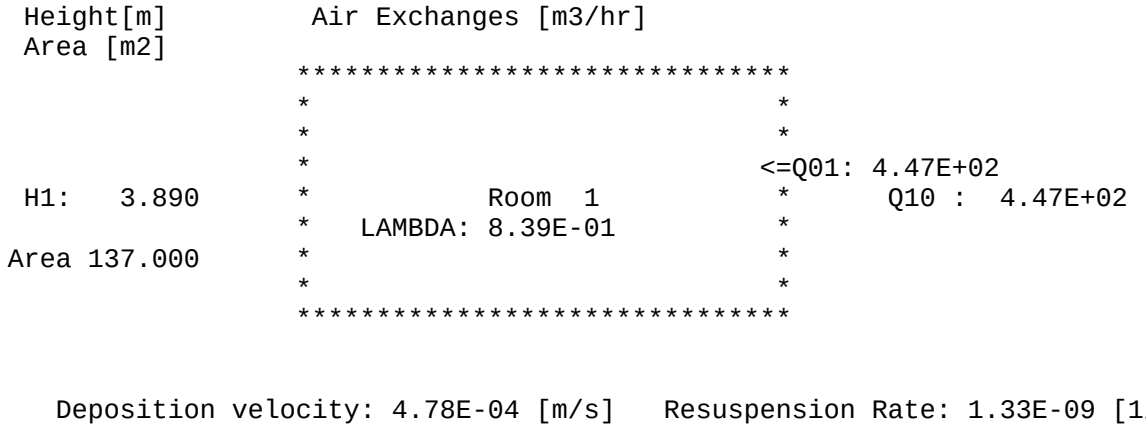
=== Receptor-Source Shielding Relationship ===

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Eu-154
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Eu-154
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.30E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-154	1.000E+00	9.550E-06	2.860E-04	7.172E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	BRTRATE(1)	TRIANGULAR	12	33.6	46	
2	AIRFR(1)	TRIANGULAR	.000001	.07	1	
3	LAMBDAT	TRUNCATED LOGNORMAL-N	.4187	.88	.001	.999
4	EROS0(1, 1)	TRIANGULAR	0	0	5.6E-7	
5	UD	LOGUNIFORM	.0000027	.0027		

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

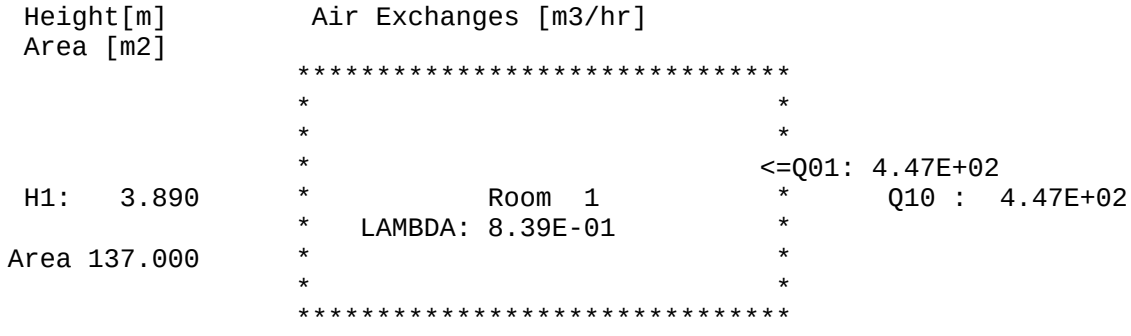
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Eu-155
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Eu-155
 Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
EU-155	1.000E+00	1.530E-06	4.140E-05	2.908E-04

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	BRTRATE(1)	TRIANGULAR	12	33.6	46
2	INGE2(1)	LOGUNIFORM	.000028	.00029	

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

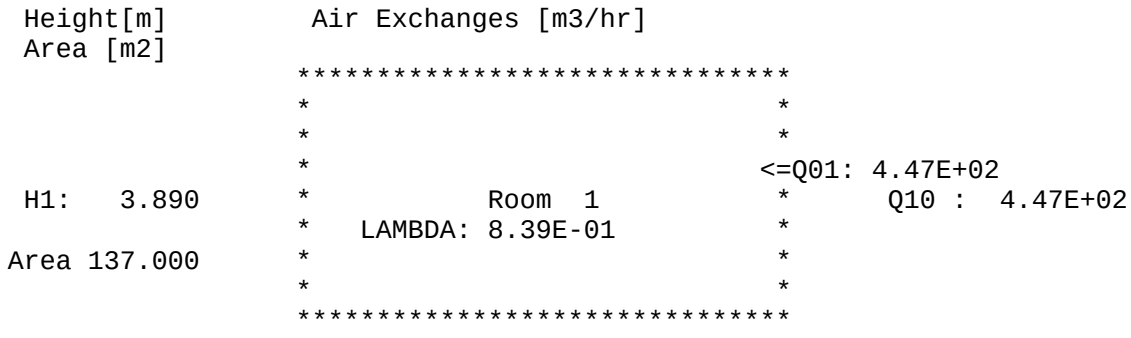
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Np-237
 Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Np-237
 Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.50E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
		Ingestion	Inhalation	Submersion
	[pCi/g]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m3)]
NP-237	1.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

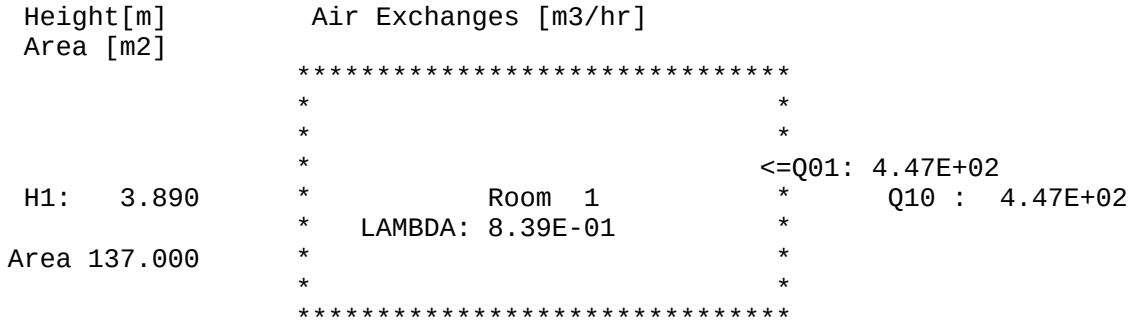
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pu-238
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pu-238
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	: 1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07
Porosity	:1.00E-01
Eff. Diffusion [m2/s]	:2.00E-05
Emanation Fractions(1)	:2.00E-01
(2)	:2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-238	1.000E+00	3.200E-03	3.920E-01	5.700E-07
U-234	0.000E+00	2.830E-04	1.320E-01	8.912E-07
TH-230	0.000E+00	5.480E-04	3.260E-01	2.032E-06
RA-226	0.000E+00	1.321E-03	8.594E-03	1.035E-02
PB-210	0.000E+00	5.376E-03	1.380E-02	1.043E-05

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

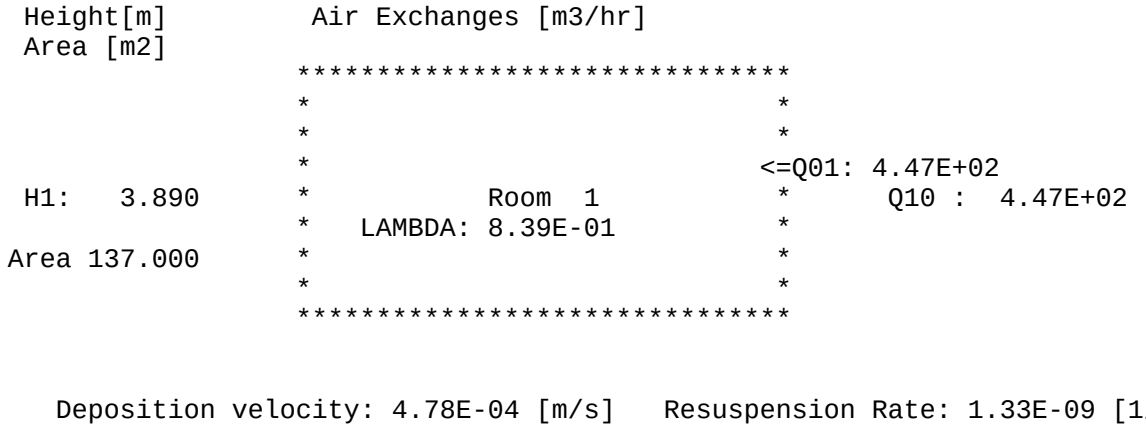
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pu-239
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pu-239
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-239	1.000E+00	3.540E-03	4.290E-01	4.952E-07
U-235	0.000E+00	2.673E-04	1.230E-01	9.019E-04
PA-231	0.000E+00	1.060E-02	1.280E+00	2.009E-04
AC-227	0.000E+00	1.480E-02	6.724E+00	2.161E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

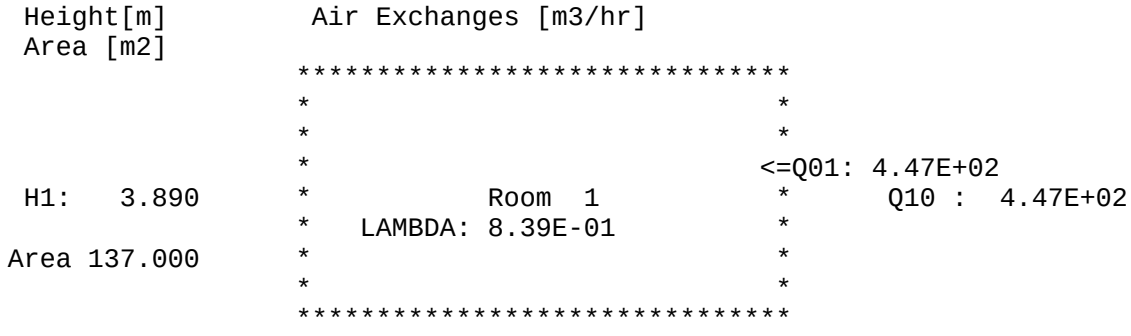
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pu-240
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pu-240
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.50E+00
Material	Concrete
Erosion Rate [cm/day]	2.80E-07
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-240	1.000E+00	3.540E-03	4.290E-01	5.548E-07
U-236	0.000E+00	2.690E-04	1.250E-01	5.852E-07
TH-232	0.000E+00	2.730E-03	1.640E+00	1.018E-06
TH-228	0.000E+00	8.086E-04	3.454E-01	9.378E-03
RA-228	0.000E+00	1.442E-03	5.078E-03	5.583E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

 Title : Volumetric DCGL for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActDCGL.bld

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

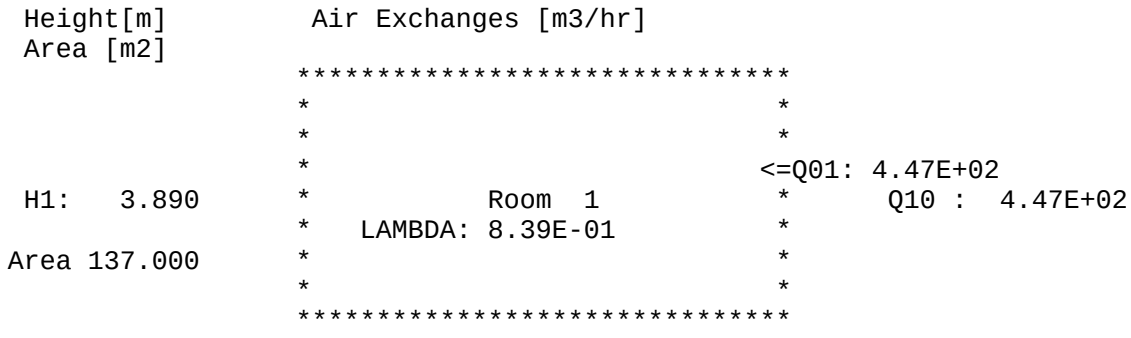
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pu-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.50E+00
Material :Concrete
Erosion Rate [cm/day] :2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-241	1.000E+00	6.840E-05	8.250E-03	2.555E-08
AM-241	0.000E+00	3.640E-03	4.440E-01	9.554E-05
NP-237	0.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029
2	UD	LOGUNIFORM	.0000027 .0027

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

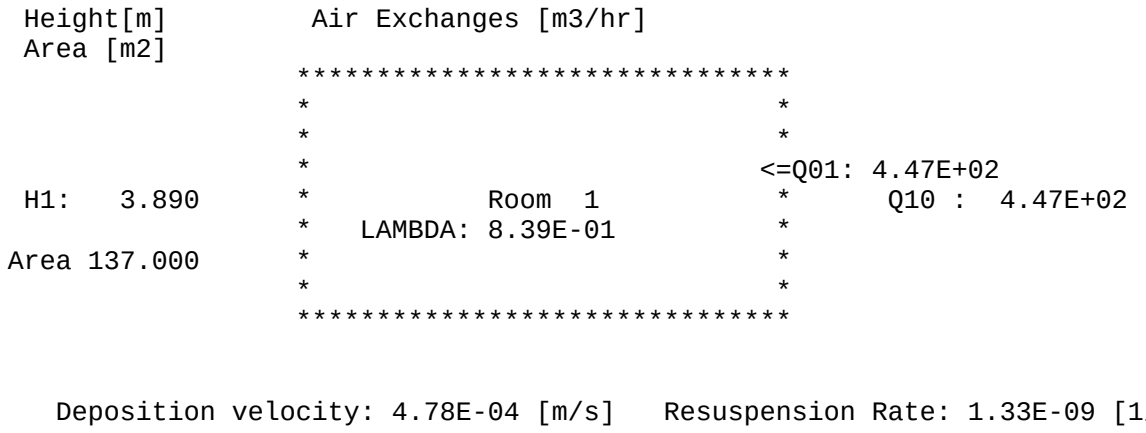
Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s] Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Am-241
 Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	:1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
AM-241	1.000E+00	3.640E-03	4.440E-01	9.554E-05
NP-237	0.000E+00	4.444E-03	5.400E-01	1.212E-03
U-233	0.000E+00	2.890E-04	1.350E-01	1.904E-06
TH-229	0.000E+00	4.027E-03	2.169E+00	1.741E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

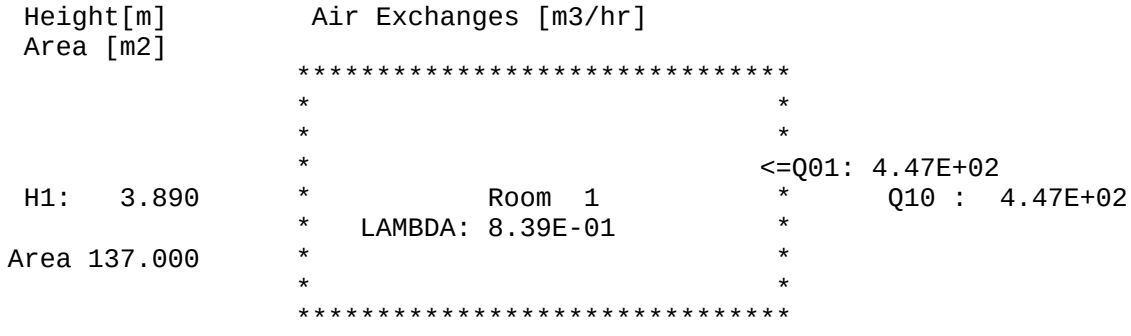
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Pu-242
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Pu-242
 Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	1
Thickness [cm]	3.05E+01
Density [g/cm3]	2.50E+00
Material	Concrete
Erosion Rate [cm/day]	2.80E-07
Porosity	1.00E-01
Eff. Diffusion [m2/s]	2.00E-05
Emanation Fractions(1)	2.00E-01
(2)	2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
PU-242	1.000E+00	3.360E-03	4.110E-01	4.684E-07
U-238	0.000E+00	2.687E-04	1.180E-01	1.597E-04
U-234	0.000E+00	2.830E-04	1.320E-01	8.912E-07
TH-230	0.000E+00	5.480E-04	3.260E-01	2.032E-06
RA-226	0.000E+00	1.321E-03	8.594E-03	1.035E-02
PB-210	0.000E+00	5.376E-03	1.380E-02	1.043E-05

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029

RESRAD-BUILD Input Parameters

Number of Sources : 1
Number of Receptors: 1
Total Time   : 3.652500E+02 days
Fraction Inside   : 2.670000E-01

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	5.850	5.850	1.000	1.000	3.57E+01	1.61E-04

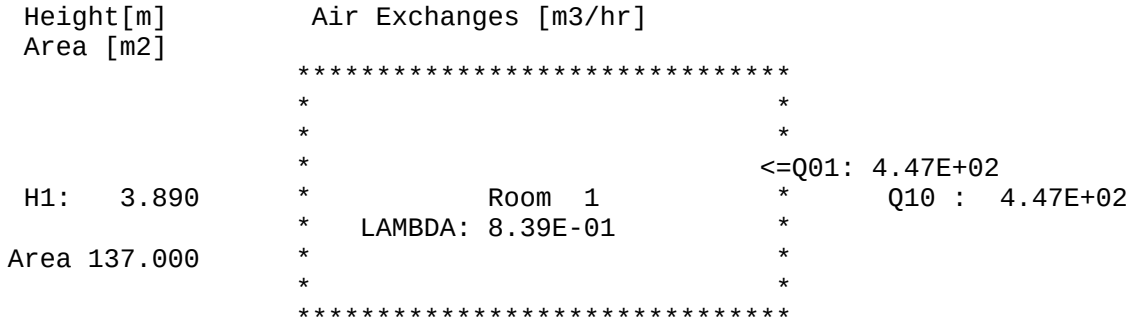
Receptor-Source Shielding Relationship

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

 Title : Volumetric DCGL for Cm-244
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActDCGL.bld

======== Building Information ========

Building Air Exchange Rate: 8.39E-01 1/hr



Deposition velocity: 4.78E-04 [m/s]   Resuspension Rate: 1.33E-09 [1/s]

 Title : Volumetric DCGL for Cm-244
 Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActDCGL.bld

======== Source Information ========

Source: 1
Location:: Room : 1 x: 5.85 y: 5.85 z: 0.00[m]
Geometry:: Type: Volume Area:1.37E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 3.450E-07 [gm/hr]
Fraction released to air: 5.180E-01

Containment :: Number of Regions: 1 Contaminated Region: 1

Region	: 1
Thickness [cm]	:3.05E+01
Density [g/cm3]	:2.50E+00
Material	:Concrete
Erosion Rate [cm/day]	:2.80E-07
Porosity	:1.00E-01
Eff. Diffusion [m2/s]	:2.00E-05
Emanation Fractions(1)	:2.00E-01
(2)	:2.00E-01

Contamination::

Nuclide	Concentration	Dose Conversion Factor (Library: FGR 13 Morbidity		
	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
CM-244	1.000E+00	2.020E-03	2.480E-01	5.735E-07
PU-240	0.000E+00	3.540E-03	4.290E-01	5.548E-07
U-236	0.000E+00	2.690E-04	1.250E-01	5.852E-07
TH-232	0.000E+00	2.730E-03	1.640E+00	1.018E-06
TH-228	0.000E+00	8.086E-04	3.454E-01	9.378E-03
RA-228	0.000E+00	1.442E-03	5.078E-03	5.583E-03

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	INGE2(1)	LOGUNIFORM	.000028 .00029
2	UD	LOGUNIFORM	.0000027 .0027

Attachment 8.7

RESRAD-BUILD v3.3 Probabilistic Output Report Nuclide Specific Results for Derivation of Bulk Material Single Nuclide DCGLs

Title   : Volumetric DCGL for H-3
Input File : C:\Program Files\RESRAD_Family\BUILD\H3ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	3.18E-03	3.18E-03
Maximum	3.18E-03	3.18E-03
Average	3.18E-03	3.18E-03
Std.Dev	1.35E-09	1.35E-09
* Total *		
Minimum	3.18E-03	3.18E-03
Maximum	3.18E-03	3.18E-03
Average	3.18E-03	3.18E-03
Std.Dev	1.35E-09	1.35E-09

 Title : Volumetric DCGL for C-14
 Input File : C:\Program Files\RESRAD_Family\BUILD\C14ActDCGL.bld
 Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Total
Receptor 1	1.56E-05	1.56E-05
Total	1.56E-05	1.56E-05

Title : Volumetric DCGL for Na-22
Input File : C:\Program Files\RESRAD_Family\BUILD\Na22ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	2.98E+00	2.98E+00
Maximum	2.98E+00	2.98E+00
Average	2.98E+00	2.98E+00
Std.Dev	2.13E-05	2.13E-05
* Total *		
Minimum	2.98E+00	2.98E+00
Maximum	2.98E+00	2.98E+00
Average	2.98E+00	2.98E+00
Std.Dev	2.13E-05	2.13E-05

 Title : Volumetric DCGL for Fe-55
 Input File : C:\Program Files\RESRAD_Family\BUILD\Fe55ActDCGL.bld
 Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

	Source 1	Total
Receptor 1	6.40E-07	6.40E-07
Total	6.40E-07	6.40E-07

Title   : Volumetric DCGL for Ni-59
Input File : C:\Program Files\RESRAD_Family\BUILD\Ni59ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	1.54E-06	1.54E-06
Maximum	1.82E-06	1.82E-06
Average	1.68E-06	1.68E-06
Std.Dev	8.09E-08	8.09E-08
* Total *		
Minimum	1.54E-06	1.54E-06
Maximum	1.82E-06	1.82E-06
Average	1.68E-06	1.68E-06
Std.Dev	8.09E-08	8.09E-08

Title   : Volumetric DCGL for Co-60
Input File : C:\Program Files\RESRAD_Family\BUILD\Co60ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	3.54E+00	3.54E+00
Maximum	3.54E+00	3.54E+00
Average	3.54E+00	3.54E+00
Std.Dev	4.64E-05	4.64E-05
* Total *		
Minimum	3.54E+00	3.54E+00
Maximum	3.54E+00	3.54E+00
Average	3.54E+00	3.54E+00
Std.Dev	4.64E-05	4.64E-05

Title   : Volumetric DCGL for Ni-63
Input File : C:\Program Files\RESRAD_Family\BUILD\Ni63ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	3.35E-06	3.35E-06
Maximum	3.96E-06	3.96E-06
Average	3.65E-06	3.65E-06
Std.Dev	1.76E-07	1.76E-07
* Total *		
Minimum	3.35E-06	3.35E-06
Maximum	3.96E-06	3.96E-06
Average	3.65E-06	3.65E-06
Std.Dev	1.76E-07	1.76E-07

 Title : Volumetric DCGL for Sr-90
 Input File : C:\Program Files\RESRAD_Family\BUILD\Sr90ActDCGL.bld
 Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

		Source 1	Total
Receptor	1	6.01E-03	6.01E-03
Total		6.01E-03	6.01E-03

Title   : Volumetric DCGL for Nb-94
Input File : C:\Program Files\RESRAD_Family\BUILD\Nb94ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	2.11E+00	2.11E+00
Maximum	2.11E+00	2.11E+00
Average	2.11E+00	2.11E+00
Std.Dev	2.22E-05	2.22E-05
* Total *		
Minimum	2.11E+00	2.11E+00
Maximum	2.11E+00	2.11E+00
Average	2.11E+00	2.11E+00
Std.Dev	2.22E-05	2.22E-05

 Title : Volumetric DCGL for Tc-99
 Input File : C:\Program Files\RESRAD_Family\BUILD\Tc99ActDCGL.bld
 Evaluation Time: 0.00000000E+00 years

RESRAD-BUILDDose Tables

Source Contributions to Receptor Doses

[mrem]

		Source 1	Total
Receptor	1	3.39E-05	3.39E-05
Total		3.39E-05	3.39E-05

Title   : Volumetric DCGL for Ag-108m
Input File : C:\Program Files\RESRAD_Family\BUILD\Ag108mActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	2.09E+00	2.09E+00
Maximum	2.09E+00	2.09E+00
Average	2.09E+00	2.09E+00
Std.Dev	1.83E-05	1.83E-05
* Total *		
Minimum	2.09E+00	2.09E+00
Maximum	2.09E+00	2.09E+00
Average	2.09E+00	2.09E+00
Std.Dev	1.83E-05	1.83E-05

Title   : Volumetric DCGL for Sb-125
Input File : C:\Program Files\RESRAD_Family\BUILD\Sb125ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	5.26E-01	5.26E-01
Maximum	5.26E-01	5.26E-01
Average	5.26E-01	5.26E-01
Std.Dev	5.82E-06	5.82E-06
* Total *		
Minimum	5.26E-01	5.26E-01
Maximum	5.26E-01	5.26E-01
Average	5.26E-01	5.26E-01
Std.Dev	5.82E-06	5.82E-06

Title   : Volumetric DCGL for Cs-134
Input File : C:\Program Files\RESRAD_Family\BUILD\Cs134ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	2.05E+00	2.05E+00
Maximum	2.05E+00	2.05E+00
Average	2.05E+00	2.05E+00
Std.Dev	2.02E-05	2.02E-05
* Total *		
Minimum	2.05E+00	2.05E+00
Maximum	2.05E+00	2.05E+00
Average	2.05E+00	2.05E+00
Std.Dev	2.02E-05	2.02E-05

Title   : Volumetric DCGL for Cs-137
Input File : C:\Program Files\RESRAD_Family\BUILD\Cs137ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	7.40E-01	7.40E-01
Maximum	7.40E-01	7.40E-01
Average	7.40E-01	7.40E-01
Std.Dev	7.84E-07	7.84E-07
* Total *		
Minimum	7.40E-01	7.40E-01
Maximum	7.40E-01	7.40E-01
Average	7.40E-01	7.40E-01
Std.Dev	7.84E-07	7.84E-07

Title   : Volumetric DCGL for Pm-147
Input File : C:\Program Files\RESRAD_Family\BUILD\Pm147ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	1.52E-05	1.52E-05
Maximum	1.53E-05	1.53E-05
Average	1.52E-05	1.52E-05
Std.Dev	1.27E-08	1.27E-08
* Total *		
Minimum	1.52E-05	1.52E-05
Maximum	1.53E-05	1.53E-05
Average	1.52E-05	1.52E-05
Std.Dev	1.27E-08	1.27E-08

Title   : Volumetric DCGL for Eu-152
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu152ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	1.52E+00	1.52E+00
Maximum	1.52E+00	1.52E+00
Average	1.52E+00	1.52E+00
Std.Dev	5.71E-05	5.71E-05
* Total *		
Minimum	1.52E+00	1.52E+00
Maximum	1.52E+00	1.52E+00
Average	1.52E+00	1.52E+00
Std.Dev	5.71E-05	5.71E-05

Title   : Volumetric DCGL for Eu-154
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu154ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	1.67E+00	1.67E+00
Maximum	1.67E+00	1.67E+00
Average	1.67E+00	1.67E+00
Std.Dev	3.25E-05	3.25E-05
* Total *		
Minimum	1.67E+00	1.67E+00
Maximum	1.67E+00	1.67E+00
Average	1.67E+00	1.67E+00
Std.Dev	3.25E-05	3.25E-05

Title   : Volumetric DCGL for Eu-155
Input File : C:\Program Files\RESRAD_Family\BUILD\Eu155ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	3.20E-02	3.20E-02
Maximum	3.20E-02	3.20E-02
Average	3.20E-02	3.20E-02
Std.Dev	1.18E-06	1.18E-06
* Total *		
Minimum	3.20E-02	3.20E-02
Maximum	3.20E-02	3.20E-02
Average	3.20E-02	3.20E-02
Std.Dev	1.18E-06	1.18E-06

Title   : Volumetric DCGL for Np-237
Input File : C:\Program Files\RESRAD_Family\BUILD\Np237ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	3.20E-01	3.20E-01
Maximum	3.65E-01	3.65E-01
Average	3.34E-01	3.34E-01
Std.Dev	1.26E-02	1.26E-02
* Total *		
Minimum	3.20E-01	3.20E-01
Maximum	3.65E-01	3.65E-01
Average	3.34E-01	3.34E-01
Std.Dev	1.26E-02	1.26E-02

Title   : Volumetric DCGL for Pu-238
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu238ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	6.11E-02	6.11E-02
Maximum	8.63E-02	8.63E-02
Average	6.92E-02	6.92E-02
Std.Dev	7.02E-03	7.02E-03
* Total *		
Minimum	6.11E-02	6.11E-02
Maximum	8.63E-02	8.63E-02
Average	6.92E-02	6.92E-02
Std.Dev	7.02E-03	7.02E-03

Title   : Volumetric DCGL for Pu-239
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu239ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	7.31E-02	7.31E-02
Maximum	1.09E-01	1.09E-01
Average	8.46E-02	8.46E-02
Std.Dev	9.99E-03	9.99E-03
* Total *		
Minimum	7.31E-02	7.31E-02
Maximum	1.09E-01	1.09E-01
Average	8.46E-02	8.46E-02
Std.Dev	9.99E-03	9.99E-03

Title   : Volumetric DCGL for Pu-240
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu240ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	7.29E-02	7.29E-02
Maximum	1.09E-01	1.09E-01
Average	8.45E-02	8.45E-02
Std.Dev	9.96E-03	9.96E-03
* Total *		
Minimum	7.29E-02	7.29E-02
Maximum	1.09E-01	1.09E-01
Average	8.45E-02	8.45E-02
Std.Dev	9.96E-03	9.96E-03

Title   : Volumetric DCGL for Pu-241
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu241ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	6.65E-04	6.65E-04
Maximum	1.33E-03	1.33E-03
Average	1.22E-03	1.22E-03
Std.Dev	1.59E-04	1.59E-04
* Total *		
Minimum	6.65E-04	6.65E-04
Maximum	1.33E-03	1.33E-03
Average	1.22E-03	1.22E-03
Std.Dev	1.59E-04	1.59E-04

Title   : Volumetric DCGL for Am-241
Input File : C:\Program Files\RESRAD_Family\BUILD\Am241ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	8.14E-02	8.14E-02
Maximum	1.16E-01	1.16E-01
Average	9.26E-02	9.26E-02
Std.Dev	9.72E-03	9.72E-03
* Total *		
Minimum	8.14E-02	8.14E-02
Maximum	1.16E-01	1.16E-01
Average	9.26E-02	9.26E-02
Std.Dev	9.72E-03	9.72E-03

Title   : Volumetric DCGL for Pu-242
Input File : C:\Program Files\RESRAD_Family\BUILD\Pu242ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	6.99E-02	6.99E-02
Maximum	1.04E-01	1.04E-01
Average	8.09E-02	8.09E-02
Std.Dev	9.49E-03	9.49E-03
* Total *		
Minimum	6.99E-02	6.99E-02
Maximum	1.04E-01	1.04E-01
Average	8.09E-02	8.09E-02
Std.Dev	9.49E-03	9.49E-03

Title   : Volumetric DCGL for Cm-244
Input File : C:\Program Files\RESRAD_Family\BUILD\Cm244ActDCGL.bld
Evaluation Time: 0.00000000E+00 years

Statistics for Dose (mrem) for Time: 1

Receptor	1	Source Total
*** 1***		
Minimum	2.17E-02	2.17E-02
Maximum	4.10E-02	4.10E-02
Average	3.72E-02	3.72E-02
Std.Dev	4.22E-03	4.22E-03
* Total *		
Minimum	2.17E-02	2.17E-02
Maximum	4.10E-02	4.10E-02
Average	3.72E-02	3.72E-02
Std.Dev	4.22E-03	4.22E-03