

APPENDIX B

RESRAD-BUILD INPUT PARAMETERS

PARAMETER NAME	PARAMETER CODE	UNITS	REMARK	DEFAULT VALUE	COMM 90% U	COMM 3% U	DEMO 90% U	DEMO 3% U	COMM Co-60	DEMO Co-60	REMARKS
RADIOLOGICAL UNITS											
Activity Units				pCi	dpm	dpm	dpm	dpm	dpm	dpm	
Area Units				m ²	m ²	m ³	m ²	m ²	m ²	m ²	
Dose Units				mrem	mrem	mrem	mrem	mrem	mrem	mrem	
TIME PARAMETERS											
Total Time	TTIME	Days		365	365	365	60	60	365	60	Conservatively assumes that Building Demolition will occur over a period of 60 days. It is likely that demo will occur in less than 20 days.
Fraction Inside	FTIN	Unit less		0.5	0.219	0.219	0.42	0.42	0.219	0.42	COMM: 1920 hours/y = 48 weeks/y x 5d/wk x 8 hours/d DEMO: 600 hours/y = 60 days x 10 hours/d
Number of times for Calculation	NTIME	Unit less	The number of dose calculations	1	1	1	1	1	1	1	
Time	DOSE_TIME	Years	The years at which dose calculations are performed	1	0	0	0	0	0	0	
Maximum Time Integration Points	POINT	Unit less		17	17	17	17	17	17	17	
BUILDING PARAMETERS											
Number of Rooms	NROOM	Unit less		1	1	1	1	1	1	1	
Deposition Velocity	UD	m/sec		0.01	0.01	0.01	0.001	0.001	0.01	0.001	An order of magnitude (x10) more conservative than the RESRAD default in the DEMO Scenarios
Resuspension Rate	DKSUS	1/sec		0.0000005	0.0000005	0.0000005	0.00005	0.00005	0.0000005	0.00005	Two orders of magnitude (x100) more conservative than the RESRAD default in the DEMO Scenarios
Room Height	H1	m		2.5	6	6	6	6	6	6	Approximate Height of Bldg. 3 High Bay
Room Area	AREA	m ²		36	5000	5000	5000	5000	5000	5000	Approximate Area of Bldg. 3 High Bay
Air Exchange Rate (Building)	LAMBDAT	1/h		0.8	0.8	0.8	5	5	0.8	5	Building envelop integrity is compromised during DEMO Scenarios
Air Exchange Rate (Room)	LINPUT	1/h		0.8	0.8	0.8	5	5	0.8	5	
Flow Rate between Rooms	Q12	m ³ /h	2 and 3-room models only	NA	NA	NA	NA	NA	NA	NA	
Flow Rate between Rooms	Q21	m ³ /h	2 and 3-room models only	NA	NA	NA	NA	NA	NA	NA	
Flow Rate between Rooms	Q23	m ³ /h	3-room models only	NA	NA	NA	NA	NA	NA	NA	
Flow Rate between Rooms	Q32	m ³ /h	3-room models only	NA	NA	NA	NA	NA	NA	NA	
Outdoor Inflow	Q10	m ³ /h	Automatically Calculated by RESBUILD	72	24000	24000	150000	150000	24000	150000	Automatically Calculated by RESRAD-BUILD. As the Building and room sizes grow, the inflow and outflow grow to maintain constant air exchange rate
Outdoor Outflow	Q01	m ³ /h	Automatically Calculated by RESBUILD	72	24000	24000	150000	150000	24000	150000	
RECEPTOR PARAMETERS											
Number of Receptors	ND	Unit less		1	2	2	2	2	2	2	Model conservatively captures dose potential to two receptors
Receptor Room	DLVL	Unit less		1	1	1	1	1	1	1	
Receptor 1 Location	DX1	m	This parameter specifies the spatial coordinates of the receptor location point (x, y, z Cartesian coordinate system)	1, 1, 1	50, 25, 1	50, 25, 2	50, 25, 1	50, 25, 1	50, 25, 1	50, 25, 1	Receptor 1 is located in the center of the room/building
Receptor 2 Location	DX2	m		1, 1, 1	3, 3, 1	3, 3, 2	3, 3, 1	3, 3, 1	3, 3, 1	3, 3, 1	Receptor 2 is located in a corner of the room/building
Receptor Time Fraction	TWGHT	Unit less		1	1	1	1	1	1	1	
Receptor Breathing/Inhalation Rate	BRTRATE	m ³ /d		18	18	18	20	20	18	20	Inhalation rate is conservatively increased to 20 m ³ /d for receptors engaged in the demolition scenarios
Indirect Ingestion Rate	INGE2	m ² /h		0.0001	0.0001	0.0001	0.005	0.005	0.0001	0.005	Indirect Ingestion Rate is conservatively increased by a factor of 50 (x50) for receptors engaged in the demolition scenarios
SOURCE PARAMETERS											
Number of Sources	NS	Unit less		1	6	6	6	6	6	6	All walls, the floor, and the ceiling of the building are conservatively assumed to be uniformly contaminated at the concentration limit
Source Room (Source #1)	SLVL1	Unit less		1	1	1	1	1	1	1	
Source Room (Source #2)	SLVL2	Unit less		1	1	1	1	1	1	1	
Source Room (Source #3)	SLVL3	Unit less		1	1	1	1	1	1	1	
Source Room (Source #4)	SLVL4	Unit less		1	1	1	1	1	1	1	
Source Room (Source #5)	SLVL5	Unit less		1	1	1	1	1	1	1	
Source Room (Source #6)	SLVL6	Unit less	The room that the particular source is located within	1	1	1	1	1	1	1	All sources are assigned to Room #1 in the single room model.
Source Type (Source #1)	STYPE1	Unit less		Volume	Area	Area	Area	Area	Area	Area	
Source Type (Source #2)	STYPE2	Unit less		Volume	Area	Area	Area	Area	Area	Area	
Source Type (Source #3)	STYPE3	Unit less		Volume	Area	Area	Area	Area	Area	Area	
Source Type (Source #4)	STYPE4	Unit less		Volume	Area	Area	Area	Area	Area	Area	

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Source Type (Source #5)	STYPE5	Unit less		Volume	Area	Area	Area	Area	Area	Area	
Source Type (Source #6)	STYPE6	Unit less		Volume	Area	Area	Area	Area	Area	Area	
Source Direction (Source #1)	SDIR1	Unit less		x-axis	x-axis	x-axis	x-axis	x-axis	x-axis	x-axis	
Source Direction (Source #2)	SDIR2	Unit less		x-axis	y-axis	y-axis	y-axis	y-axis	y-axis	y-axis	
Source Direction (Source #3)	SDIR3	Unit less		x-axis	x-axis	x-axis	x-axis	x-axis	x-axis	x-axis	
Source Direction (Source #4)	SDIR4	Unit less		x-axis	y-axis	y-axis	y-axis	y-axis	y-axis	y-axis	
Source Direction (Source #5)	SDIR5	Unit less		x-axis	z-axis	z-axis	z-axis	z-axis	z-axis	z-axis	
Source Direction (Source #6)	SDIR6	Unit less		x-axis	z-axis	z-axis	z-axis	z-axis	z-axis	z-axis	
Source Location (Source #1)	SX1	m	This parameter specifies the spatial coordinates of the receptor location point (x, y, z Cartesian coordinate system)	0, 0, 0	0, 25, 3	0, 25, 4	0, 25, 3	0, 25, 3	0, 25, 3	0, 25, 3	Rectangular sources are centered on each of the four walls, the floor, and the ceiling.
Source Location (Source #2)	SX2	m		0, 0, 0	50, 50, 3	50, 50, 4	50, 50, 3	50, 50, 3	50, 50, 3	50, 50, 3	
Source Location (Source #3)	SX3	m		0, 0, 0	100, 25, 3	100, 25, 4	100, 25, 3	100, 25, 3	100, 25, 3	100, 25, 3	
Source Location (Source #4)	SX4	m		0, 0, 0	50, 0, 3	50, 0, 4	50, 0, 3	50, 0, 3	50, 0, 3	50, 0, 3	
Source Location (Source #5)	SX5	m		0, 0, 0	50, 25, 0	50, 25, 0	50, 25, 0	50, 25, 0	50, 25, 0	50, 25, 0	
Source Location (Source #6)	SX6	m		0, 0, 0	50, 25, 6	50, 25, 6	50, 25, 6	50, 25, 6	50, 25, 6	50, 25, 6	
Source Area (Source #1)	SAREA1	m ²		36	300	300	300	300	300	300	
Source Area (Source #2)	SAREA2	m ²	36	600	600	600	600	600	600	600	100m x 6m
Source Area (Source #3)	SAREA3	m ²	36	300	300	300	300	300	300	300	50m x 6m
Source Area (Source #4)	SAREA4	m ²	36	600	600	600	600	600	600	600	100m x 6m
Source Area (Source #5)	SAREA5	m ²	36	5000	5000	5000	5000	5000	5000	5000	100 m x 50 m
Source Area (Source #6)	SAREA6	m ²	36	5000	5000	5000	5000	5000	5000	5000	100 m x 50 m
Air Release Fraction	AIRFR	Unit less		0.1	0.1	0.1	0.25	0.25	0.1	0.25	COMM: Assumes that 10% of the removable surface activity is released from the surface directly into the interior air space DEMO: Conservatively assumes that 25% of the removable surface activity is released from the surface directly into the interior air space
Direct Ingestion Rate	INGE1	1/h		0	0	0	0	0	0	0	
Removable Fraction	RMVFR	Unit less		0.5	0.1	0.1	0.025	0.025	0.1	0.025	COMM: Assumes that 10% of the total surface activity will be eroded (removable) from the building surfaces over the source lifetime (RF0=7300 days) DEMO: Assumes that 2.5% of the total surface activity will be eroded (removable) from the building surfaces over the source lifetime (RF0=60 days)
Source Lifetime	RF0	Days	Time for Source Removal	365	7300	7300	60	60	7300	60	COMM: Exposure (Source) lifetime = 7300 days (20 years) DEMO: Exposure (Source) lifetime = 60 days (2 months)
Radon Release Fraction	RRF	Unit less		0.1	0	0	0	0	0	0	NA
Radionuclide Concentration/Activity	RNUACT1	dpm/m ²	U-234 (or Co-60)	NA	7.38E+06	5.71E+06	1.84E+06	1.48E+06	6.98E+05	2.12E+06	Source concentrations required to produce 19 mrem/y
Radionuclide Concentration/Activity	RNUACT2	dpm/m ²	U-235	NA	2.30E+05	2.88E+05	5.74E+04	7.47E+04	NA	NA	
Radionuclide Concentration/Activity	RNUACT3	dpm/m ²	U-238	NA	3.57E+03	1.47E+06	8.88E+02	3.80E+05	NA	NA	
Radionuclide Concentration/Activity	RNUACT4	dpm/m ²	Not Used	NA	NA	NA	NA	NA	NA	NA	
Radionuclide Concentration/Activity	RNUACT5	dpm/m ²	Not Used	NA	NA	NA	NA	NA	NA	NA	
Radionuclide Concentration/Activity	RNUACT6	dpm/m ²	Not Used	NA	NA	NA	NA	NA	NA	NA	
Number of Regions in Volume Source	NREGI0	Unit less	NA for Area Source	1	NA	NA	NA	NA	NA	NA	NA
Contaminated Region (number of)	FCONT0	Unit less	NA for Area Source	1	NA	NA	NA	NA	NA	NA	NA
Source Region Thickness	THICK0	cm	NA for Area Source	15	NA	NA	NA	NA	NA	NA	NA
Source Density	DENSI0	g/cm ³	NA for Area Source	2.4	NA	NA	NA	NA	NA	NA	NA
Source Erosion Rate	EROS0	cm/d	NA for Area Source	2.40E-08	NA	NA	NA	NA	NA	NA	NA
Source Porosity	POROS0	Unit less	NA for Area Source	2.50E-01	NA	NA	NA	NA	NA	NA	NA
Radon Effective Diffusion Coefficient	EFDIF0	m ² /s	NA for Area Source	2.00E-06	NA	NA	NA	NA	NA	NA	NA
Radon Emanation Fraction	EMANA0	Unit less	NA for Area Source	2.00E-01	NA	NA	NA	NA	NA	NA	NA
Source Material Definition	MTLS	Unit less	NA for Area Source	Concrete	NA	NA	NA	NA	NA	NA	NA
SHIELDING PARAMETERS											
Shielding Thickness	DSTH	cm		0	0	0	0	0	0	0	
Shielding Density	DSDEN	g/cm ³		2.4	2.4	2.4	2.4	2.4	2.4	2.4	
Shielding Material	MTLC	Unit less		Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	