

Appendix H38 –
RESRAD 7.0 Output for Area 3.1 Pu

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

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Summary : RESRAD Default Parameters
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Dose Conversion Factor (and Related) Parameter Summary Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: FGR 12)	4.951E-04	4.951E-04	DCF1(1)
A-1	At-219 (Source: no data)	0.000E+00	-2.000E+00	DCF1(2)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(3)
A-1	Bi-211 (Source: FGR 12)	2.559E-01	2.559E-01	DCF1(4)
A-1	Bi-215 (Source: no data)	0.000E+00	-2.000E+00	DCF1(5)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(6)
A-1	Fr-223 (Source: FGR 12)	1.980E-01	1.980E-01	DCF1(7)
A-1	Pa-231 (Source: FGR 12)	1.906E-01	1.906E-01	DCF1(8)
A-1	Pb-211 (Source: FGR 12)	3.064E-01	3.064E-01	DCF1(9)
A-1	Po-211 (Source: FGR 12)	4.764E-02	4.764E-02	DCF1(10)
A-1	Po-215 (Source: FGR 12)	1.016E-03	1.016E-03	DCF1(11)
A-1	Pu-239 (Source: FGR 12)	2.952E-04	2.952E-04	DCF1(12)
A-1	Ra-223 (Source: FGR 12)	6.034E-01	6.034E-01	DCF1(13)
A-1	Rn-219 (Source: FGR 12)	3.083E-01	3.083E-01	DCF1(14)
A-1	Sr-90 (Source: FGR 12)	7.043E-04	7.043E-04	DCF1(15)
A-1	Th-227 (Source: FGR 12)	5.212E-01	5.212E-01	DCF1(16)
A-1	Th-231 (Source: FGR 12)	3.643E-02	3.643E-02	DCF1(17)
A-1	Tl-207 (Source: FGR 12)	1.980E-02	1.980E-02	DCF1(18)
A-1	U-235 (Source: FGR 12)	7.211E-01	7.211E-01	DCF1(19)
A-1	U-235m (Source: no data)	0.000E+00	-1.000E+00	DCF1(20)
A-1	Y-90 (Source: FGR 12)	2.391E-02	2.391E-02	DCF1(21)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)
B-1	Ac-227+D1	6.724E+00	6.700E+00	DCF2(2)
B-1	Ac-227+D2	6.708E+00	6.700E+00	DCF2(3)
B-1	Ac-227+D3	6.708E+00	6.700E+00	DCF2(4)
B-1	Ac-227+D4	6.700E+00	6.700E+00	DCF2(5)
B-1	Ac-227+D5	6.700E+00	6.700E+00	DCF2(6)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(7)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(14)
B-1	Pu-239+D	4.290E-01	4.290E-01	DCF2(20)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(26)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(27)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)
D-1	Ac-227+D1	1.480E-02	1.410E-02	DCF3(2)
D-1	Ac-227+D2	1.477E-02	1.410E-02	DCF3(3)
D-1	Ac-227+D3	1.477E-02	1.410E-02	DCF3(4)
D-1	Ac-227+D4	1.411E-02	1.410E-02	DCF3(5)
D-1	Ac-227+D5	1.411E-02	1.410E-02	DCF3(6)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(7)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(14)
D-1	Pu-239+D	3.540E-03	3.540E-03	DCF3(20)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(26)
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(27)

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Dose Conversion Factor (and Related) Parameter Summary (continued) Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ac-227+D1 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(2,1)
D-34	Ac-227+D1 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(2,2)
D-34	Ac-227+D1 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(2,3)
D-34				
D-34	Ac-227+D2 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(3,1)
D-34	Ac-227+D2 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(3,2)
D-34	Ac-227+D2 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(3,3)
D-34				
D-34	Ac-227+D3 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(4,1)
D-34	Ac-227+D3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(4,2)
D-34	Ac-227+D3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(4,3)
D-34				
D-34	Ac-227+D4 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	Ac-227+D4 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(5,2)
D-34	Ac-227+D4 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(5,3)
D-34				
D-34	Ac-227+D5 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Ac-227+D5 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,2)
D-34	Ac-227+D5 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(7,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(7,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(7,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(8,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(8,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(14,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(14,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(14,3)
D-34				
D-34	Pu-239+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20,1)
D-34	Pu-239+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(20,2)
D-34	Pu-239+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(20,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(26,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(26,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(26,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(27,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(27,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(27,3)
D-34				

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Dose Conversion Factor (and Related) Parameter Summary (continued)
 Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Ac-227+D1 , fish	1.500E+01	1.500E+01	BIOFAC(2,1)
D-5	Ac-227+D1 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Ac-227+D2 , fish	1.500E+01	1.500E+01	BIOFAC(3,1)
D-5	Ac-227+D2 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(3,2)
D-5				
D-5	Ac-227+D3 , fish	1.500E+01	1.500E+01	BIOFAC(4,1)
D-5	Ac-227+D3 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	Ac-227+D4 , fish	1.500E+01	1.500E+01	BIOFAC(5,1)
D-5	Ac-227+D4 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(5,2)
D-5				
D-5	Ac-227+D5 , fish	1.500E+01	1.500E+01	BIOFAC(6,1)
D-5	Ac-227+D5 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(7,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(14,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(14,2)
D-5				
D-5	Pu-239+D , fish	3.000E+01	3.000E+01	BIOFAC(20,1)
D-5	Pu-239+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(20,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(26,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(26,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(27,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(27,2)
D-5				

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
 *Base Case means Default.Lib w/o Associate Nuclide contributions.

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	6.450E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.650E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.016E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.091E+00	0.000E+00	---	S1(14)
R012	Initial principal radionuclide (pCi/g): Sr-90	5.620E-01	0.000E+00	---	S1(26)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(14)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(26)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.600E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.400E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.600E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	7.800E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.160E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	4.700E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.100E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.370E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.600E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.500E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.400E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pump intake depth (m below water table)	5.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	5.720E+03	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	2.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.600E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.500E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.400E+02	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(7)
R016	Unsat. zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.333E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.600E+03	2.000E+03	---	DCNUCC(14)
R016	Unsat. zone 1 (cm**3/g)	2.600E+03	2.000E+03	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	2.600E+03	2.000E+03	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.746E-05	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCC(26)
R016	Unsat. zone 1 (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCU(26,1)
R016	Saturated zone (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCS(26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.919E-02	ALEACH(26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(26)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	1.740E+03	2.000E+01	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	1.740E+03	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.740E+03	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.585E-05	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	2.040E+03	5.000E+01	---	DCNUCC(8)
R016	Unsat. zone 1 (cm**3/g)	2.040E+03	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	2.040E+03	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.323E-05	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 7
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(27)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(27,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(27)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.254E-03	ALEACH(27)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(27)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.480E-05	1.000E-04	---	MLINH
R017	Exposure duration	1.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	1.000E+00	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	2.730E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.120E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.100E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	2.330E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.500E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	9.000E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 8
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Drinking water intake (L/yr)	7.300E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	1.000E+00	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	2.730E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	6.420E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	4.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	1.750E+00	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	6.700E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	1.800E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (l/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (l/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 9
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 10
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	64500.00 square meters	Cs-137	1.016E+00
Thickness:	1.00 meters	Pu-239	1.091E+00
Cover Depth:	0.00 meters	Sr-90	5.620E-01

Total Dose TDOSE(t), mrem/yr
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr
 Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	7.237E+00	6.954E+00	6.427E+00	4.932E+00	2.567E+00	9.482E-01	5.912E-01	5.549E-01
M(t):	2.895E-01	2.782E-01	2.571E-01	1.973E-01	1.027E-01	3.793E-02	2.365E-02	2.220E-02

Maximum TDOSE(t): 7.237E+00 mrem/yr at t = 0.000E+00 years

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 11
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
 Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.422E+00	0.1965	7.081E-07	0.0000	0.000E+00	0.0000	2.671E-01	0.0369	1.559E-01	0.0215	2.873E-01	0.0397	8.361E-04	0.0001
Pu-239	1.357E-04	0.0000	1.035E-02	0.0014	0.000E+00	0.0000	5.163E-01	0.0713	1.325E-02	0.0018	5.091E-04	0.0001	6.431E-02	0.0089
Sr-90	5.613E-03	0.0008	1.583E-05	0.0000	0.000E+00	0.0000	3.340E+00	0.4615	3.796E-01	0.0525	7.726E-01	0.1068	1.393E-03	0.0002
Total	1.427E+00	0.1972	1.036E-02	0.0014	0.000E+00	0.0000	4.123E+00	0.5697	5.488E-01	0.0758	1.060E+00	0.1465	6.654E-02	0.0092

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
 Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.133E+00	0.2947
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.048E-01	0.0836
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.499E+00	0.6217
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.237E+00	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 12
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.389E+00	0.1997	6.917E-07	0.0000	0.000E+00	0.0000	2.609E-01	0.0375	1.523E-01	0.0219	2.806E-01	0.0403	8.167E-04	0.0001
Pu-239	1.357E-04	0.0000	1.035E-02	0.0015	0.000E+00	0.0000	5.162E-01	0.0742	1.325E-02	0.0019	5.090E-04	0.0001	6.431E-02	0.0092
Sr-90	5.321E-03	0.0008	1.501E-05	0.0000	0.000E+00	0.0000	3.167E+00	0.4554	3.601E-01	0.0518	7.328E-01	0.1054	1.320E-03	0.0002
Total	1.394E+00	0.2005	1.036E-02	0.0015	0.000E+00	0.0000	3.944E+00	0.5671	5.257E-01	0.0756	1.014E+00	0.1458	6.644E-02	0.0096

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E+00	0.2996
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.048E-01	0.0870
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.266E+00	0.6135
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.954E+00	1.0000
*Sum of	all water independent and dependent pathways.													

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 13
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
 Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.325E+00	0.2061	6.599E-07	0.0000	0.000E+00	0.0000	2.490E-01	0.0387	1.453E-01	0.0226	2.677E-01	0.0417	7.792E-04	0.0001
Pu-239	1.357E-04	0.0000	1.034E-02	0.0016	0.000E+00	0.0000	5.162E-01	0.0803	1.325E-02	0.0021	5.089E-04	0.0001	6.430E-02	0.0100
Sr-90	4.784E-03	0.0007	1.349E-05	0.0000	0.000E+00	0.0000	2.847E+00	0.4429	3.237E-01	0.0504	6.587E-01	0.1025	1.187E-03	0.0002
Total	1.330E+00	0.2069	1.036E-02	0.0016	0.000E+00	0.0000	3.612E+00	0.5619	4.823E-01	0.0750	9.270E-01	0.1442	6.626E-02	0.0103

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
 Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.988E+00	0.3092
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.047E-01	0.0941
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.835E+00	0.5967
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.427E+00	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 14
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.124E+00	0.2279	5.598E-07	0.0000	0.000E+00	0.0000	2.112E-01	0.0428	1.233E-01	0.0250	2.271E-01	0.0460	6.609E-04	0.0001
Pu-239	1.356E-04	0.0000	1.034E-02	0.0021	0.000E+00	0.0000	5.158E-01	0.1046	1.324E-02	0.0027	5.086E-04	0.0001	6.426E-02	0.0130
Sr-90	3.295E-03	0.0007	9.293E-06	0.0000	0.000E+00	0.0000	1.961E+00	0.3976	2.230E-01	0.0452	4.537E-01	0.0920	8.175E-04	0.0002
Total	1.127E+00	0.2286	1.035E-02	0.0021	0.000E+00	0.0000	2.688E+00	0.5450	3.595E-01	0.0729	6.813E-01	0.1381	6.574E-02	0.0133

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.686E+00	0.3419
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.043E-01	0.1225
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E+00	0.5356
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.932E+00	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 15
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years
 Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	7.023E-01	0.2736	3.498E-07	0.0000	0.000E+00	0.0000	1.320E-01	0.0514	7.703E-02	0.0300	1.419E-01	0.0553	4.130E-04	0.0002
Pu-239	1.354E-04	0.0001	1.032E-02	0.0040	0.000E+00	0.0000	5.150E-01	0.2006	1.322E-02	0.0051	5.078E-04	0.0002	6.415E-02	0.0250
Sr-90	1.135E-03	0.0004	3.202E-06	0.0000	0.000E+00	0.0000	6.757E-01	0.2632	7.683E-02	0.0299	1.563E-01	0.0609	2.817E-04	0.0001
Total	7.035E-01	0.2741	1.032E-02	0.0040	0.000E+00	0.0000	1.323E+00	0.5152	1.671E-01	0.0651	2.988E-01	0.1164	6.484E-02	0.0253

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years
 Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.054E+00	0.4104
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.033E-01	0.2350
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.103E-01	0.3546
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.567E+00	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 16
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years
 Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.354E-01	0.1428	6.746E-08	0.0000	0.000E+00	0.0000	2.545E-02	0.0268	1.486E-02	0.0157	2.737E-02	0.0289	7.966E-05	0.0001
Pu-239	1.346E-04	0.0001	1.026E-02	0.0108	0.000E+00	0.0000	5.119E-01	0.5398	1.314E-02	0.0139	5.047E-04	0.0005	6.376E-02	0.0672
Sr-90	2.728E-05	0.0000	7.693E-08	0.0000	0.000E+00	0.0000	1.623E-02	0.0171	1.846E-03	0.0019	3.756E-03	0.0040	6.768E-06	0.0000
Total	1.356E-01	0.1430	1.026E-02	0.0108	0.000E+00	0.0000	5.535E-01	0.5838	2.984E-02	0.0315	3.163E-02	0.0334	6.385E-02	0.0673

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years
 Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-01	0.2143
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.997E-01	0.6324
Sr-90	6.740E-02	0.0711	1.177E-03	0.0012	0.000E+00	0.0000	2.697E-02	0.0284	8.420E-03	0.0089	1.954E-02	0.0206	1.454E-01	0.1533
Total	6.740E-02	0.0711	1.177E-03	0.0012	0.000E+00	0.0000	2.697E-02	0.0284	8.420E-03	0.0089	1.954E-02	0.0206	9.482E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 17
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years
 Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	1.229E-03	0.0021	6.123E-10	0.0000	0.000E+00	0.0000	2.310E-04	0.0004	1.348E-04	0.0002	2.484E-04	0.0004	7.230E-07	0.0000
Pu-239	1.323E-04	0.0002	1.008E-02	0.0171	0.000E+00	0.0000	5.031E-01	0.8509	1.291E-02	0.0218	4.961E-04	0.0008	6.267E-02	0.1060
Sr-90	6.442E-10	0.0000	1.817E-12	0.0000	0.000E+00	0.0000	3.833E-07	0.0000	4.359E-08	0.0000	8.870E-08	0.0000	1.598E-10	0.0000
Total	1.362E-03	0.0023	1.008E-02	0.0171	0.000E+00	0.0000	5.033E-01	0.8513	1.305E-02	0.0221	7.446E-04	0.0013	6.267E-02	0.1060

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years
 Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.844E-03	0.0031
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.894E-01	0.9969
Sr-90	1.592E-06	0.0000	2.780E-08	0.0000	0.000E+00	0.0000	6.370E-07	0.0000	1.989E-07	0.0000	4.616E-07	0.0000	3.433E-06	0.0000
Total	1.592E-06	0.0000	2.780E-08	0.0000	0.000E+00	0.0000	6.370E-07	0.0000	1.989E-07	0.0000	4.616E-07	0.0000	5.912E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 18
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	8.759E-11	0.0000	4.362E-17	0.0000	0.000E+00	0.0000	1.646E-11	0.0000	9.607E-12	0.0000	1.770E-11	0.0000	5.151E-14	0.0000
Pu-239	1.246E-04	0.0002	9.492E-03	0.0171	0.000E+00	0.0000	4.736E-01	0.8536	1.216E-02	0.0219	4.670E-04	0.0008	5.900E-02	0.1063
Sr-90	4.124E-26	0.0000	1.163E-28	0.0000	0.000E+00	0.0000	2.454E-23	0.0000	2.791E-24	0.0000	5.679E-24	0.0000	1.023E-26	0.0000
Total	1.246E-04	0.0002	9.492E-03	0.0171	0.000E+00	0.0000	4.736E-01	0.8536	1.216E-02	0.0219	4.670E-04	0.0008	5.900E-02	0.1063

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.314E-10	0.0000
Pu-239	2.614E-07	0.0000	7.637E-10	0.0000	0.000E+00	0.0000	1.010E-07	0.0000	1.476E-09	0.0000	2.223E-08	0.0000	5.549E-01	1.0000
Sr-90	1.019E-22	0.0000	1.779E-24	0.0000	0.000E+00	0.0000	4.078E-23	0.0000	1.273E-23	0.0000	2.955E-23	0.0000	2.198E-22	0.0000
Total	2.614E-07	0.0000	7.637E-10	0.0000	0.000E+00	0.0000	1.010E-07	0.0000	1.476E-09	0.0000	2.223E-08	0.0000	5.549E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 19
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

		Dose/Source Ratios Summed Over All Pathways									
		Parent and Progeny Principal Radionuclide Contributions Indicated									
0	Parent	Product	Parent and Progeny Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
	(i)	(j)		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
	Cs-137+D	Cs-137+D	1.000E+00	2.099E+00	2.051E+00	1.956E+00	1.659E+00	1.037E+00	2.000E-01	1.815E-03	1.293E-10
0	Pu-239	Pu-239	5.901E-04	3.271E-04	3.271E-04	3.271E-04	3.269E-04	3.263E-04	3.243E-04	3.188E-04	3.001E-04
	Pu-239	U-235+D	5.901E-04	1.274E-13	3.838E-13	8.936E-13	2.643E-12	7.359E-12	2.097E-11	4.302E-11	2.621E-10
	Pu-239	Pa-231	5.901E-04	3.166E-17	2.340E-16	1.263E-15	1.133E-14	9.314E-14	9.172E-13	6.329E-12	3.641E-11
	Pu-239	Ac-227+D	5.901E-04	1.393E-19	1.795E-18	1.882E-17	4.437E-16	8.995E-15	1.935E-13	1.941E-12	1.414E-11
	Pu-239	EDSR(j)		3.271E-04	3.271E-04	3.271E-04	3.269E-04	3.263E-04	3.243E-04	3.188E-04	3.001E-04
0	Pu-239	Pu-239	1.633E-06	9.054E-07	9.053E-07	9.052E-07	9.046E-07	9.031E-07	8.976E-07	8.823E-07	8.306E-07
	Pu-239	U-235+D	1.633E-06	3.525E-16	1.062E-15	2.473E-15	7.316E-15	2.037E-14	5.805E-14	1.191E-13	7.253E-13
	Pu-239	Pa-231	1.633E-06	8.762E-20	6.476E-19	3.496E-18	3.135E-17	2.578E-16	2.538E-15	1.752E-14	1.008E-13
	Pu-239	Ac-227+D1	1.633E-06	2.521E-22	3.962E-21	4.665E-20	1.180E-18	2.453E-17	5.325E-16	5.354E-15	3.905E-14
	Pu-239	EDSR(j)		9.054E-07	9.053E-07	9.052E-07	9.046E-07	9.031E-07	8.976E-07	8.823E-07	8.306E-07
0	Pu-239	Pu-239	8.257E-06	4.577E-06	4.577E-06	4.576E-06	4.573E-06	4.566E-06	4.538E-06	4.461E-06	4.199E-06
	Pu-239	U-235+D	8.257E-06	1.782E-15	5.370E-15	1.250E-14	3.699E-14	1.030E-13	2.935E-13	6.020E-13	3.667E-12
	Pu-239	Pa-231	8.257E-06	4.430E-19	3.274E-18	1.767E-17	1.585E-16	1.303E-15	1.283E-14	8.855E-14	5.095E-13
	Pu-239	Ac-227+D2	8.257E-06	1.239E-21	1.950E-20	2.297E-19	5.816E-18	1.209E-16	2.624E-15	2.638E-14	1.930E-13
	Pu-239	EDSR(j)		4.577E-06	4.577E-06	4.576E-06	4.573E-06	4.566E-06	4.538E-06	4.461E-06	4.199E-06
0	Pu-239	Pu-239	2.285E-08	1.267E-08	1.267E-08	1.267E-08	1.266E-08	1.264E-08	1.256E-08	1.235E-08	1.162E-08
	Pu-239	U-235+D	2.285E-08	4.932E-18	1.486E-17	3.460E-17	1.024E-16	2.850E-16	8.122E-16	1.666E-15	1.015E-14
	Pu-239	Pa-231	2.285E-08	1.226E-21	9.062E-21	4.891E-20	4.386E-19	3.607E-18	3.552E-17	2.451E-16	1.410E-15
	Pu-239	Ac-227+D3	2.285E-08	3.436E-24	5.407E-23	6.370E-22	1.613E-20	3.351E-19	7.276E-18	7.315E-17	5.349E-16
	Pu-239	EDSR(j)		1.267E-08	1.267E-08	1.267E-08	1.266E-08	1.264E-08	1.256E-08	1.235E-08	1.162E-08
0	Pu-239	Pu-239	4.954E-10	2.747E-10	2.746E-10	2.746E-10	2.744E-10	2.740E-10	2.723E-10	2.677E-10	2.520E-10
	Pu-239	U-235+D	4.954E-10	1.069E-19	3.222E-19	7.503E-19	2.219E-18	6.179E-18	1.761E-17	3.612E-17	2.200E-16
	Pu-239	Pa-231	4.954E-10	2.658E-23	1.965E-22	1.060E-21	9.509E-21	7.820E-20	7.701E-19	5.313E-18	3.057E-17
	Pu-239	Ac-227+D4	4.954E-10	6.634E-26	1.048E-24	1.237E-23	3.134E-22	6.516E-21	1.415E-19	1.422E-18	1.049E-17
	Pu-239	EDSR(j)		2.747E-10	2.746E-10	2.746E-10	2.744E-10	2.740E-10	2.723E-10	2.677E-10	2.520E-10
0	Pu-239	Pu-239	1.371E-12	7.602E-13	7.601E-13	7.600E-13	7.595E-13	7.582E-13	7.536E-13	7.408E-13	6.974E-13
	Pu-239	U-235+D	1.371E-12	2.959E-22	8.918E-22	2.076E-21	6.142E-21	1.710E-20	4.873E-20	9.997E-20	6.089E-19
	Pu-239	Pa-231	1.371E-12	7.356E-26	5.437E-25	2.935E-24	2.632E-23	2.164E-22	2.131E-21	1.471E-20	8.461E-20
	Pu-239	Ac-227+D5	1.371E-12	1.840E-28	2.907E-27	3.431E-26	8.693E-25	1.807E-23	3.924E-22	3.945E-21	2.908E-20
	Pu-239	EDSR(j)		7.602E-13	7.601E-13	7.600E-13	7.595E-13	7.582E-13	7.536E-13	7.408E-13	6.974E-13
0	Pu-239+D	Pu-239+D	9.829E-01	5.449E-01	5.449E-01	5.448E-01	5.444E-01	5.435E-01	5.402E-01	5.310E-01	4.999E-01
	Pu-239+D	U-235+D	9.829E-01	2.121E-10	6.393E-10	1.488E-09	4.403E-09	1.226E-08	3.493E-08	7.166E-08	4.365E-07
	Pu-239+D	Pa-231	9.829E-01	5.273E-14	3.898E-13	2.104E-12	1.887E-11	1.551E-10	1.528E-09	1.054E-08	6.065E-08
	Pu-239+D	Ac-227+D	9.829E-01	2.320E-16	2.989E-15	3.135E-14	7.391E-13	1.498E-11	3.223E-10	3.233E-09	2.355E-08
	Pu-239+D	EDSR(j)		5.449E-01	5.449E-01	5.448E-01	5.444E-01	5.435E-01	5.402E-01	5.310E-01	4.999E-01

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 20
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Dose/Source Ratios Summed Over All Pathways										
Parent and Progeny Principal Radionuclide Contributions Indicated										
O	Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)						
				0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02 1.000E+03
	Pu-239+D	Pu-239+D	2.720E-03	1.508E-03	1.508E-03	1.508E-03	1.507E-03	1.504E-03	1.495E-03	1.470E-03 1.384E-03
	Pu-239+D	U-235+D	2.720E-03	5.871E-13	1.769E-12	4.119E-12	1.219E-11	3.393E-11	9.668E-11	1.983E-10 1.208E-09
	Pu-239+D	Pa-231	2.720E-03	1.459E-16	1.079E-15	5.823E-15	5.221E-14	4.294E-13	4.228E-12	2.917E-11 1.679E-10
	Pu-239+D	Ac-227+D1	2.720E-03	4.199E-19	6.599E-18	7.770E-17	1.966E-15	4.086E-14	8.870E-13	8.918E-12 6.504E-11
	Pu-239+D	ΣDSR(j)	1.508E-03	1.508E-03	1.508E-03	1.507E-03	1.504E-03	1.495E-03	1.470E-03	1.384E-03
0	Pu-239+D	Pu-239+D	1.375E-02	7.624E-03	7.624E-03	7.623E-03	7.618E-03	7.605E-03	7.559E-03	7.430E-03 6.995E-03
	Pu-239+D	U-235+D	1.375E-02	2.968E-12	8.945E-12	2.083E-11	6.161E-11	1.715E-10	4.888E-10	1.003E-09 6.108E-09
	Pu-239+D	Pa-231	1.375E-02	7.378E-16	5.454E-15	2.944E-14	2.640E-13	2.171E-12	2.138E-11	1.475E-10 8.486E-10
	Pu-239+D	Ac-227+D2	1.375E-02	2.064E-18	3.247E-17	3.827E-16	9.687E-15	2.013E-13	4.371E-12	4.394E-11 3.214E-10
	Pu-239+D	ΣDSR(j)	7.624E-03	7.624E-03	7.623E-03	7.618E-03	7.605E-03	7.559E-03	7.430E-03	6.995E-03
0	Pu-239+D	Pu-239+D	3.806E-05	2.110E-05	2.110E-05	2.110E-05	2.108E-05	2.105E-05	2.092E-05	2.056E-05 1.936E-05
	Pu-239+D	U-235+D	3.806E-05	8.215E-15	2.476E-14	5.764E-14	1.705E-13	4.747E-13	1.353E-12	2.775E-12 1.690E-11
	Pu-239+D	Pa-231	3.806E-05	2.042E-18	1.509E-17	8.148E-17	7.306E-16	6.008E-15	5.916E-14	4.082E-13 2.349E-12
	Pu-239+D	Ac-227+D3	3.806E-05	5.724E-21	9.006E-20	1.061E-18	2.686E-17	5.582E-16	1.212E-14	1.218E-13 8.910E-13
	Pu-239+D	ΣDSR(j)	2.110E-05	2.110E-05	2.110E-05	2.108E-05	2.105E-05	2.092E-05	2.056E-05	1.936E-05
0	Pu-239+D	Pu-239+D	8.252E-07	4.575E-07	4.575E-07	4.574E-07	4.571E-07	4.563E-07	4.536E-07	4.458E-07 4.197E-07
	Pu-239+D	U-235+D	8.252E-07	1.781E-16	5.367E-16	1.250E-15	3.697E-15	1.029E-14	2.933E-14	6.017E-14 3.665E-13
	Pu-239+D	Pa-231	8.252E-07	4.427E-20	3.272E-19	1.766E-18	1.584E-17	1.303E-16	1.283E-15	8.850E-15 5.092E-14
	Pu-239+D	Ac-227+D4	8.252E-07	1.105E-22	1.745E-21	2.060E-20	5.221E-19	1.085E-17	2.356E-16	2.369E-15 1.747E-14
	Pu-239+D	ΣDSR(j)	4.575E-07	4.575E-07	4.574E-07	4.571E-07	4.563E-07	4.536E-07	4.458E-07	4.197E-07
0	Pu-239+D	Pu-239+D	2.284E-09	1.266E-09	1.266E-09	1.266E-09	1.265E-09	1.263E-09	1.255E-09	1.234E-09 1.162E-09
	Pu-239+D	U-235+D	2.284E-09	4.930E-19	1.486E-18	3.459E-18	1.023E-17	2.848E-17	8.118E-17	1.665E-16 1.014E-15
	Pu-239+D	Pa-231	2.284E-09	1.225E-22	9.057E-22	4.889E-21	4.384E-20	3.605E-19	3.550E-18	2.449E-17 1.409E-16
	Pu-239+D	Ac-227+D5	2.284E-09	3.065E-25	4.841E-24	5.714E-23	1.448E-21	3.010E-20	6.536E-19	6.571E-18 4.844E-17
	Pu-239+D	ΣDSR(j)	1.266E-09	1.266E-09	1.266E-09	1.265E-09	1.263E-09	1.255E-09	1.234E-09	1.162E-09
0	Sr-90+D	Sr-90+D	1.000E+00	8.005E+00	7.591E+00	6.824E+00	4.700E+00	1.620E+00	2.587E-01	6.109E-06 3.911E-22

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g								
Basic Radiation Dose Limit = 2.500E+01 mrem/yr								
ONuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02 1.000E+03
Cs-137	1.191E+01	1.219E+01	1.278E+01	1.507E+01	2.411E+01	1.250E+02	1.377E+04	1.933E+11
Pu-239	4.509E+01	4.510E+01	4.511E+01	4.513E+01	4.521E+01	4.548E+01	4.628E+01	4.915E+01
Sr-90	3.123E+00	3.293E+00	3.664E+00	5.319E+00	1.544E+01	9.664E+01	4.092E+06	*1.366E+14

*At specific activity limit

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 21
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 0.000E+00 years

ONuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)		(pCi/g)		(pCi/g)
Cs-137	1.016E+00	0.000E+00	2.099E+00	1.191E+01	2.099E+00	1.191E+01
Pu-239	1.091E+00	0.000E+00	5.544E-01	4.509E+01	5.544E-01	4.509E+01
Sr-90	5.620E-01	0.000E+00	8.005E+00	3.123E+00	8.005E+00	3.123E+00

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days. 07/22/2016 11:17 Page 22
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Individual Nuclide Dose Summed Over All Pathways Parent Nuclide and Branch Fraction Indicated									
ONuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr						
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02 1.000E+03
Cs-137	Cs-137	1.000E+00	2.133E+00	2.083E+00	1.988E+00	1.686E+00	1.054E+00	2.032E-01	1.844E-03 1.314E-10
OPu-239	Pu-239	5.901E-04	3.569E-04	3.569E-04	3.568E-04	3.566E-04	3.560E-04	3.538E-04	3.478E-04 3.274E-04
Pu-239	Pu-239	1.633E-06	9.878E-07	9.877E-07	9.875E-07	9.869E-07	9.852E-07	9.793E-07	9.626E-07 9.062E-07
Pu-239	ΣDOSE(j)		3.579E-04	3.579E-04	3.578E-04	3.576E-04	3.570E-04	3.548E-04	3.488E-04 3.283E-04
OU-235	Pu-239	5.901E-04	1.390E-13	4.187E-13	9.749E-13	2.884E-12	8.029E-12	2.288E-11	4.694E-11 2.859E-10
U-235	Pu-239	1.633E-06	3.846E-16	1.159E-15	2.698E-15	7.982E-15	2.222E-14	6.333E-14	1.299E-13 7.913E-13
U-235	Pu-239	8.257E-06	1.944E-15	5.859E-15	1.364E-14	4.035E-14	1.123E-13	3.202E-13	6.568E-13 4.000E-12
U-235	Pu-239	2.285E-08	5.381E-18	1.622E-17	3.775E-17	1.117E-16	3.109E-16	8.861E-16	1.818E-15 1.107E-14
U-235	Pu-239	4.954E-10	1.167E-19	3.516E-19	8.185E-19	2.421E-18	6.741E-18	1.921E-17	3.941E-17 2.400E-16
U-235	Pu-239	1.371E-12	3.229E-22	9.730E-22	2.265E-21	6.701E-21	1.866E-20	5.317E-20	1.091E-19 6.643E-19
U-235	Pu-239	9.829E-01	2.314E-10	6.975E-10	1.624E-09	4.804E-09	1.337E-08	3.811E-08	7.819E-08 4.762E-07
U-235	Pu-239	2.720E-03	6.406E-13	1.930E-12	4.494E-12	1.329E-11	3.701E-11	1.055E-10	2.164E-10 1.318E-09
U-235	Pu-239	1.375E-02	3.238E-12	9.759E-12	2.272E-11	6.721E-11	1.871E-10	5.333E-10	1.094E-09 6.663E-09
U-235	Pu-239	3.806E-05	8.963E-15	2.701E-14	6.289E-14	1.860E-13	5.179E-13	1.476E-12	3.028E-12 1.844E-11
U-235	Pu-239	8.252E-07	1.943E-16	5.856E-16	1.363E-15	4.033E-15	1.123E-14	3.200E-14	6.564E-14 3.998E-13
U-235	Pu-239	2.284E-09	5.378E-19	1.621E-18	3.773E-18	1.116E-17	3.108E-17	8.856E-17	1.817E-16 1.107E-15
U-235	ΣDOSE(j)		2.355E-10	7.096E-10	1.652E-09	4.887E-09	1.361E-08	3.878E-08	7.955E-08 4.845E-07
OPa-231	Pu-239	5.901E-04	3.454E-17	2.553E-16	1.378E-15	1.236E-14	1.016E-13	1.001E-12	6.904E-12 3.972E-11
Pa-231	Pu-239	1.633E-06	9.559E-20	7.065E-19	3.814E-18	3.420E-17	2.812E-16	2.769E-15	1.911E-14 1.099E-13
Pa-231	Pu-239	8.257E-06	4.833E-19	3.572E-18	1.928E-17	1.729E-16	1.422E-15	1.400E-14	9.661E-14 5.558E-13
Pa-231	Pu-239	2.285E-08	1.337E-21	9.886E-21	5.337E-20	4.785E-19	3.935E-18	3.875E-17	2.674E-16 1.538E-15
Pa-231	Pu-239	4.954E-10	2.900E-23	2.143E-22	1.157E-21	1.037E-20	8.532E-20	8.401E-19	5.797E-18 3.335E-17
Pa-231	Pu-239	1.371E-12	8.025E-26	5.932E-25	3.202E-24	2.871E-23	2.361E-22	2.325E-21	1.604E-20 9.231E-20
Pa-231	Pu-239	9.829E-01	5.753E-14	4.252E-13	2.295E-12	2.058E-11	1.693E-10	1.667E-09	1.150E-08 6.617E-08
Pa-231	Pu-239	2.720E-03	1.592E-16	1.177E-15	6.353E-15	5.696E-14	4.685E-13	4.613E-12	3.183E-11 1.831E-10
Pa-231	Pu-239	1.375E-02	8.050E-16	5.950E-15	3.212E-14	2.880E-13	2.368E-12	2.332E-11	1.609E-10 9.258E-10
Pa-231	Pu-239	3.806E-05	2.228E-18	1.647E-17	8.889E-17	7.971E-16	6.555E-15	6.455E-14	4.454E-13 2.562E-12
Pa-231	Pu-239	8.252E-07	4.830E-20	3.570E-19	1.927E-18	1.728E-17	1.421E-16	1.399E-15	9.656E-15 5.555E-14
Pa-231	Pu-239	2.284E-09	1.337E-22	9.881E-22	5.334E-21	4.783E-20	3.933E-19	3.873E-18	2.672E-17 1.538E-16
Pa-231	ΣDOSE(j)		5.853E-14	4.326E-13	2.335E-12	2.094E-11	1.722E-10	1.696E-09	1.170E-08 6.732E-08
OAc-227	Pu-239	5.901E-04	1.520E-19	1.958E-18	2.053E-17	4.841E-16	9.814E-15	2.111E-13	2.118E-12 1.543E-11
Ac-227	Pu-239	9.829E-01	2.531E-16	3.261E-15	3.420E-14	8.063E-13	1.635E-11	3.517E-10	3.527E-09 2.570E-08
Ac-227	ΣDOSE(j)		2.533E-16	3.263E-15	3.422E-14	8.068E-13	1.636E-11	3.519E-10	3.529E-09 2.571E-08
OAc-227	Pu-239	1.633E-06	2.751E-22	4.322E-21	5.089E-20	1.288E-18	2.676E-17	5.810E-16	5.841E-15 4.260E-14
Ac-227	Pu-239	8.257E-06	1.352E-21	2.127E-20	2.506E-19	6.345E-18	1.319E-16	2.863E-15	2.878E-14 2.105E-13
Ac-227	Pu-239	2.720E-03	4.582E-19	7.199E-18	8.477E-17	2.145E-15	4.458E-14	9.677E-13	9.729E-12 7.095E-11
Ac-227	ΣDOSE(j)		4.598E-19	7.225E-18	8.508E-17	2.153E-15	4.474E-14	9.712E-13	9.764E-12 7.121E-11
OPu-239	Pu-239	8.257E-06	4.994E-06	4.994E-06	4.993E-06	4.990E-06	4.981E-06	4.951E-06	4.866E-06 4.582E-06
Pu-239	Pu-239	2.285E-08	1.382E-08	1.382E-08	1.382E-08	1.381E-08	1.379E-08	1.370E-08	1.347E-08 1.268E-08
Pu-239	ΣDOSE(j)		5.008E-06	5.007E-06	5.007E-06	5.003E-06	4.995E-06	4.965E-06	4.880E-06 4.594E-06
OAc-227	Pu-239	2.285E-08	3.749E-24	5.899E-23	6.950E-22	1.759E-20	3.656E-19	7.938E-18	7.980E-17 5.836E-16
Ac-227	Pu-239	4.954E-10	7.238E-26	1.143E-24	1.349E-23	3.419E-22	7.109E-21	1.543E-19	1.552E-18 1.144E-17

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 23
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

			Individual Nuclide Dose Summed Over All Pathways								
			Parent Nuclide and Branch Fraction Indicated								
			DOSE(j,t), mrem/yr								
ONuclide	Parent	THF(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
(j)	(i)										
Ac-227	Pu-239	3.806E-05		6.245E-21	9.825E-20	1.158E-18	2.930E-17	6.090E-16	1.322E-14	1.329E-13	9.721E-13
Ac-227	ΣDOSE(j)			6.249E-21	9.831E-20	1.158E-18	2.932E-17	6.094E-16	1.323E-14	1.330E-13	9.727E-13
OPu-239	Pu-239	4.954E-10		2.997E-10	2.996E-10	2.996E-10	2.994E-10	2.989E-10	2.971E-10	2.920E-10	2.749E-10
Pu-239	Pu-239	1.371E-12		8.293E-13	8.293E-13	8.291E-13	8.286E-13	8.272E-13	8.222E-13	8.082E-13	7.608E-13
Pu-239	ΣDOSE(j)			3.005E-10	3.005E-10	3.004E-10	3.002E-10	2.997E-10	2.979E-10	2.928E-10	2.757E-10
OAc-227	Pu-239	1.371E-12		2.005E-28	3.171E-27	3.743E-26	9.484E-25	1.972E-23	4.281E-22	4.304E-21	3.173E-20
Ac-227	Pu-239	2.284E-09		3.344E-25	5.282E-24	6.234E-23	1.580E-21	3.284E-20	7.130E-19	7.169E-18	5.285E-17
Ac-227	ΣDOSE(j)			3.346E-25	5.285E-24	6.238E-23	1.581E-21	3.286E-20	7.135E-19	7.173E-18	5.288E-17
OPu-239	Pu-239	9.829E-01		5.945E-01	5.944E-01	5.943E-01	5.940E-01	5.930E-01	5.894E-01	5.793E-01	5.454E-01
Pu-239	Pu-239	2.720E-03		1.645E-03	1.645E-03	1.645E-03	1.644E-03	1.641E-03	1.631E-03	1.603E-03	1.509E-03
Pu-239	ΣDOSE(j)			5.961E-01	5.961E-01	5.960E-01	5.956E-01	5.946E-01	5.910E-01	5.809E-01	5.469E-01
OPu-239	Pu-239	1.375E-02		8.318E-03	8.318E-03	8.316E-03	8.311E-03	8.297E-03	8.247E-03	8.106E-03	7.631E-03
Pu-239	Pu-239	3.806E-05		2.302E-05	2.302E-05	2.302E-05	2.300E-05	2.296E-05	2.282E-05	2.243E-05	2.112E-05
Pu-239	ΣDOSE(j)			8.341E-03	8.341E-03	8.339E-03	8.334E-03	8.320E-03	8.270E-03	8.128E-03	7.652E-03
OAc-227	Pu-239	1.375E-02		2.252E-18	3.543E-17	4.175E-16	1.057E-14	2.196E-13	4.768E-12	4.794E-11	3.507E-10
OPu-239	Pu-239	8.252E-07		4.991E-07	4.991E-07	4.990E-07	4.987E-07	4.978E-07	4.948E-07	4.864E-07	4.579E-07
Pu-239	Pu-239	2.284E-09		1.381E-09	1.381E-09	1.381E-09	1.380E-09	1.378E-09	1.370E-09	1.346E-09	1.267E-09
Pu-239	ΣDOSE(j)			5.005E-07	5.005E-07	5.004E-07	5.001E-07	4.992E-07	4.962E-07	4.877E-07	4.592E-07
OAc-227	Pu-239	8.252E-07		1.206E-22	1.904E-21	2.248E-20	5.696E-19	1.184E-17	2.571E-16	2.585E-15	1.906E-14
OSr-90	Sr-90	1.000E+00		4.499E+00	4.266E+00	3.835E+00	2.641E+00	9.103E-01	1.454E-01	3.433E-06	2.198E-22

THF(i) is the thread fraction of the parent nuclide.

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:17 Page 24
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

		Individual Nuclide Soil Concentration									
		Parent Nuclide and Branch Fraction Indicated									
		S(j,t), pCi/g									
ONuclide	Parent	THF(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
(j)	(i)										
Cs-137	Cs-137	1.000E+00		1.016E+00	9.924E-01	9.468E-01	8.031E-01	5.019E-01	9.680E-02	8.786E-04	6.259E-11
OPu-239	Pu-239	5.901E-04		6.438E-04	6.437E-04	6.436E-04	6.432E-04	6.421E-04	6.383E-04	6.273E-04	5.906E-04
Pu-239	Pu-239	1.633E-06		1.782E-06	1.782E-06	1.781E-06	1.780E-06	1.777E-06	1.766E-06	1.736E-06	1.635E-06
Pu-239	ES(j):			6.456E-04	6.455E-04	6.454E-04	6.450E-04	6.439E-04	6.400E-04	6.291E-04	5.922E-04
OU-235	Pu-239	5.901E-04		0.000E+00	6.325E-13	1.889E-12	6.203E-12	1.783E-11	5.139E-11	1.058E-10	1.374E-10
U-235	Pu-239	1.633E-06		0.000E+00	1.750E-15	5.229E-15	1.717E-14	4.934E-14	1.422E-13	2.927E-13	3.802E-13
U-235	Pu-239	8.257E-06		0.000E+00	8.850E-15	2.643E-14	8.679E-14	2.495E-13	7.191E-13	1.480E-12	1.922E-12
U-235	Pu-239	2.285E-08		0.000E+00	2.449E-17	7.316E-17	2.402E-16	6.904E-16	1.990E-15	4.095E-15	5.319E-15
U-235	Pu-239	4.954E-10		0.000E+00	5.310E-19	1.586E-18	5.208E-18	1.497E-17	4.315E-17	8.879E-17	1.153E-16
U-235	Pu-239	1.371E-12		0.000E+00	1.470E-21	4.390E-21	1.441E-20	4.143E-20	1.194E-19	2.457E-19	3.192E-19
U-235	Pu-239	9.829E-01		0.000E+00	1.054E-09	3.147E-09	1.033E-08	2.970E-08	8.560E-08	1.762E-07	2.288E-07
U-235	Pu-239	2.720E-03		0.000E+00	2.916E-12	8.709E-12	2.860E-11	8.219E-11	2.369E-10	4.875E-10	6.332E-10
U-235	Pu-239	1.375E-02		0.000E+00	1.474E-11	4.403E-11	1.446E-10	4.155E-10	1.198E-09	2.465E-09	3.201E-09
U-235	Pu-239	3.806E-05		0.000E+00	4.080E-14	1.219E-13	4.001E-13	1.150E-12	3.315E-12	6.822E-12	8.860E-12
U-235	Pu-239	8.252E-07		0.000E+00	8.845E-16	2.642E-15	8.675E-15	2.493E-14	7.187E-14	1.479E-13	1.921E-13
U-235	Pu-239	2.284E-09		0.000E+00	2.448E-18	7.312E-18	2.401E-17	6.901E-17	1.989E-16	4.093E-16	5.317E-16
U-235	ES(j):			0.000E+00	1.072E-09	3.202E-09	1.051E-08	3.021E-08	8.709E-08	1.792E-07	2.328E-07
OPa-231	Pu-239	5.901E-04		0.000E+00	6.696E-18	6.008E-17	6.608E-16	5.776E-15	5.812E-14	4.035E-13	2.247E-12
Pa-231	Pu-239	1.633E-06		0.000E+00	1.853E-20	1.663E-19	1.829E-18	1.599E-17	1.608E-16	1.117E-15	6.219E-15
Pa-231	Pu-239	8.257E-06		0.000E+00	9.369E-20	8.407E-19	9.246E-18	8.082E-17	8.132E-16	5.645E-15	3.144E-14
Pa-231	Pu-239	2.285E-08		0.000E+00	2.593E-22	2.327E-21	2.559E-20	2.237E-19	2.251E-18	1.562E-17	8.702E-17
Pa-231	Pu-239	4.954E-10		0.000E+00	5.622E-24	5.045E-23	5.548E-22	4.849E-21	4.879E-20	3.387E-19	1.887E-18
Pa-231	Pu-239	1.371E-12		0.000E+00	1.556E-26	1.396E-25	1.535E-24	1.342E-23	1.350E-22	9.375E-22	5.222E-21
Pa-231	Pu-239	9.829E-01		0.000E+00	1.115E-14	1.001E-13	1.101E-12	9.621E-12	9.680E-11	6.720E-10	3.743E-09
Pa-231	Pu-239	2.720E-03		0.000E+00	3.087E-17	2.770E-16	3.046E-15	2.663E-14	2.679E-13	1.860E-12	1.036E-11
Pa-231	Pu-239	1.375E-02		0.000E+00	1.561E-16	1.400E-15	1.540E-14	1.346E-13	1.354E-12	9.403E-12	5.237E-11
Pa-231	Pu-239	3.806E-05		0.000E+00	4.319E-19	3.876E-18	4.262E-17	3.726E-16	3.749E-15	2.603E-14	1.449E-13
Pa-231	Pu-239	8.252E-07		0.000E+00	9.364E-21	8.403E-20	9.241E-19	8.077E-18	8.127E-17	5.642E-16	3.142E-15
Pa-231	Pu-239	2.284E-09		0.000E+00	2.592E-23	2.326E-22	2.557E-21	2.236E-20	2.249E-19	1.562E-18	8.697E-18
Pa-231	ES(j):			0.000E+00	1.135E-14	1.018E-13	1.120E-12	9.788E-12	9.849E-11	6.837E-10	3.808E-09
OAc-227	Pu-239	5.901E-04		0.000E+00	7.052E-20	1.870E-18	6.509E-17	1.485E-15	3.330E-14	3.375E-13	2.157E-12
Ac-227	Pu-239	9.829E-01		0.000E+00	1.175E-16	3.115E-15	1.084E-13	2.474E-12	5.546E-11	5.622E-10	3.592E-09
Ac-227	ES(j):			0.000E+00	1.175E-16	3.117E-15	1.085E-13	2.475E-12	5.549E-11	5.625E-10	3.594E-09
OAc-227	Pu-239	1.633E-06		0.000E+00	1.952E-22	5.175E-21	1.802E-19	4.110E-18	9.215E-17	9.341E-16	5.969E-15
Ac-227	Pu-239	8.257E-06		0.000E+00	9.867E-22	2.617E-20	9.108E-19	2.078E-17	4.659E-16	4.723E-15	3.018E-14
Ac-227	Pu-239	2.720E-03		0.000E+00	3.251E-19	8.621E-18	3.001E-16	6.846E-15	1.535E-13	1.556E-12	9.942E-12
Ac-227	ES(j):			0.000E+00	3.263E-19	8.652E-18	3.012E-16	6.871E-15	1.540E-13	1.562E-12	9.978E-12
OPu-239	Pu-239	8.257E-06		9.008E-06	9.007E-06	9.006E-06	9.000E-06	8.985E-06	8.931E-06	8.778E-06	8.264E-06
Pu-239	Pu-239	2.285E-08		2.493E-08	2.493E-08	2.492E-08	2.491E-08	2.487E-08	2.472E-08	2.429E-08	2.287E-08
Pu-239	ES(j):			9.033E-06	9.032E-06	9.031E-06	9.025E-06	9.010E-06	8.955E-06	8.802E-06	8.287E-06
OAc-227	Pu-239	2.285E-08		0.000E+00	2.731E-24	7.242E-23	2.521E-21	5.751E-20	1.289E-18	1.307E-17	8.352E-17
Ac-227	Pu-239	4.954E-10		0.000E+00	5.921E-26	1.570E-24	5.465E-23	1.247E-21	2.795E-20	2.834E-19	1.811E-18

Appendix H38: RESRAD 7.0 Output for Area 3.1 Pu-239

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:17 Page 25
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA 3.1 PU.RAD

Individual Nuclide Soil Concentration										
Parent Nuclide and Branch Fraction Indicated										
ONuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Pu-239	3.806E-05	0.000E+00	4.549E-21	1.206E-19	4.199E-18	9.580E-17	2.148E-15	2.177E-14	1.391E-13
Ac-227	ES(j):		0.000E+00	4.552E-21	1.207E-19	4.201E-18	9.586E-17	2.149E-15	2.178E-14	1.392E-13
OPu-239	Pu-239	4.954E-10	5.405E-10	5.405E-10	5.404E-10	5.400E-10	5.391E-10	5.359E-10	5.267E-10	4.959E-10
Pu-239	Pu-239	1.371E-12	1.496E-12	1.496E-12	1.496E-12	1.495E-12	1.492E-12	1.483E-12	1.458E-12	1.372E-12
Pu-239	ES(j):		5.420E-10	5.420E-10	5.419E-10	5.415E-10	5.406E-10	5.374E-10	5.282E-10	4.972E-10
OAc-227	Pu-239	1.371E-12	0.000E+00	1.639E-28	4.345E-27	1.513E-25	3.451E-24	7.737E-23	7.843E-22	5.011E-21
Ac-227	Pu-239	2.284E-09	0.000E+00	2.729E-25	7.238E-24	2.519E-22	5.748E-21	1.289E-19	1.306E-18	8.347E-18
Ac-227	ES(j):		0.000E+00	2.731E-25	7.242E-24	2.521E-22	5.752E-21	1.289E-19	1.307E-18	8.352E-18
OPu-239	Pu-239	9.829E-01	1.072E+00	1.072E+00	1.072E+00	1.071E+00	1.070E+00	1.063E+00	1.045E+00	9.838E-01
Pu-239	Pu-239	2.720E-03	2.968E-03	2.968E-03	2.967E-03	2.965E-03	2.960E-03	2.942E-03	2.892E-03	2.723E-03
Pu-239	ES(j):		1.075E+00	1.075E+00	1.075E+00	1.074E+00	1.073E+00	1.066E+00	1.048E+00	9.865E-01
OPu-239	Pu-239	1.375E-02	1.500E-02	1.500E-02	1.500E-02	1.499E-02	1.497E-02	1.488E-02	1.462E-02	1.377E-02
Pu-239	Pu-239	3.806E-05	4.153E-05	4.152E-05	4.152E-05	4.149E-05	4.142E-05	4.117E-05	4.047E-05	3.810E-05
Pu-239	ES(j):		1.505E-02	1.504E-02	1.504E-02	1.503E-02	1.501E-02	1.492E-02	1.466E-02	1.380E-02
OAc-227	Pu-239	1.375E-02	0.000E+00	1.644E-18	4.358E-17	1.517E-15	3.461E-14	7.760E-13	7.866E-12	5.026E-11
OPu-239	Pu-239	8.252E-07	9.003E-07	9.002E-07	9.001E-07	8.995E-07	8.980E-07	8.926E-07	8.773E-07	8.260E-07
Pu-239	Pu-239	2.284E-09	2.492E-09	2.492E-09	2.491E-09	2.490E-09	2.485E-09	2.470E-09	2.428E-09	2.286E-09
Pu-239	ES(j):		9.028E-07	9.027E-07	9.026E-07	9.020E-07	9.005E-07	8.951E-07	8.798E-07	8.282E-07
OAc-227	Pu-239	8.252E-07	0.000E+00	9.862E-23	2.615E-21	9.103E-20	2.077E-18	4.656E-17	4.720E-16	3.016E-15
OSr-90	Sr-90	1.000E+00	5.620E-01	5.328E-01	4.790E-01	3.299E-01	1.137E-01	2.731E-03	6.450E-08	4.129E-24

THF(i) is the thread fraction of the parent nuclide.

ORESCALC.EXE execution time = 7.70 seconds