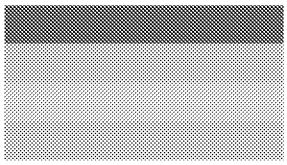
BPRG Calculator [Scenario = IW, Media = Dust, BPRG Type = Site-Specific, Risk Output = Yes, Units = pCi]

Output files:

DCGLw (dpm/100 cm^2)
DCGLw (pCi/cm^2)
Ingestion DCGLw (pCi/cm^2)
Yield
Equilibrium fraction
BPRG Output Option
Half-life (yr)
Ingestion Input Concentration (pCi/cm^2)
External Input Concentration (pCi/cm^2)
Target risk
Frequency of hand to mouth - adult, FQa
Surface area of fingers - resident child, SAres-c (cm2)
Surface area of fingers - resident adult, SAres-a (cm2)
Ingestion risk
External exposure risk
Total chain risk
Cumulative risk

Indoor_Worker_bprg_01OCT2019_Co Cs Eu H Sr at 20 pct RG_adjust HL FQa SAa_progeny with decay.pdf
Indoor_Worker_bprg_01OCT2019_Am Pu Ra Th U at 20 pct RG_adjust FQa SAa SAc_sec eq no decay.pdf
Indoor_Worker_bprg_01OCT2019_Co Cs Eu H Sr at RG_adjust HL FQa SAa_progeny with decay.pdf
Indoor_Worker_bprg_01OCT2019_Am Pu Ra Th U at RG_adjust FQa SAa SAc_sec eq no decay.pdf

Default	Am-241	Co-60	Eu-152	Eu-154	H-3	Cs-137	*Ba-137m*	Sr-90	*Y-90*
	100	5000	5000	5000	5000	5000		1000	
	0.45	22.52	22.52	22.52	22.52	22.52	22.52	4.50	4.50
	0.090	4.505	4.505	4.505	4.505	4.505	4.505	0.901	0.901
	1.0	1.0	1.0	1.0	1.0	1.0	*0.944*	1	*0.998*
	1.0	1.0	1.0	1.0	1.0	1.0	*1.0*	1	*1.0*
1	1	2	2	2	2		2		2
							30.2		28.8
.	0.0901	4.5045	4.5045	4.5045	4.5045	4.5045	4.2523	0.9009	0.8991
.	0.4505	22.523	22.523	22.523	22.523	22.5225	21.2613	4.5045	4.4955
1.00E-06								1.00E-04	
3								1.64	
49								11.5	
16								3.7	
	1.16E-06	1.36E-06	1.03E-06	1.23E-06	1.37E-08	1.54E-05	0.00E+00	4.92E-07	6.95E-07
	4.80E-08	8.21E-05	7.46E-05	6.08E-05	0.00E+00	5.41E-08	4.95E-05	7.23E-09	3.22E-07
	1.21E-06	8.35E-05	7.56E-05	6.20E-05	1.37E-08	*6.50E-05*		*1.52E-06*	
3.35E-04									



Pu-239	*U-235m*	U-235	*Th-231*	Ra-226	Th-232	
100		488		100	36.5	
0.45	0.45	2.20	2.20	0.45	0.16	
0.090	0.090	0.440	0.440	0.090	0.033	
1	*0.997*	1.0	*1.0*	1.0	1.0	
1	*1.0*	1.0	*1.0*	1.0	1.0	
1		1		1	1	4
0.0901	0.0898	0.4396	0.4396	0.0901	0.0329	
0.4505	0.4489	2.1982	2.1982	0.4505	0.1644	

1.54E-06	7.24E-14	3.06E-06	5.63E-08	2.97E-05	4.26E-06
5.28E-10	0.00E+00	1.74E-06	1.55E-07	3.91E-06	1.87E-06
1.54E-06		*5.01E-06*		3.36E-05	6.13E-06

BPRG Calculator [Scenario = Resident, Media = Dust, BPRG Type = Site-Specific, Risk Output = Yes, Units = pCi]

Output files:

DCGLw (dpm/100 cm^2)
DCGLw (pCi/cm^2)
Ingestion DCGLw (pCi/cm^2)
Yield
Equilibrium fraction
BPRG Output Option
Half-life (yr)
Ingestion Input Concentration (pCi/cm^2)
External Input Concentration (pCi/cm^2)
Target risk
Frequency of hand to mouth - adult, FQa
Surface area of fingers - resident child, SAres-c (cm2)
Surface area of fingers - resident adult, SAres-a (cm2)
Ingestion risk
External exposure risk (ground plane)
Total chain risk
Cumulative risk

Resident_bprg_01OCT2019_Co Cs Eu H Sr at 20 pct RG_adjust HL FQa SAa SAc_progeny with decay.pdf
Resident_bprg_01OCT2019_Am Pu Ra Th U at 20 pct RG_adjust FQa SAa SAc_sec eq no decay.pdf
Resident_bprg_01OCT2019_Co Cs Eu H Sr at RG_adjust HL FQa SAa SAc_progeny with decay.pdf
Resident_bprg_01OCT2019_Am Pu Ra Th U at RG_adjust FQa SAa SAc_sec eq no decay.pdf

Default	Am-241	Co-60	Eu-152	Eu-154	H-3	Cs-137	*Ba-137m*	Sr-90	*Y-90*	Pu-239
	100	5000	5000	5000	5000	5000		1000		100
	0.45	22.52	22.52	22.52	22.52	22.52	22.52	4.50	4.50	0.45
	0.09	4.50	4.50	4.50	4.50	4.50	4.50	0.90	0.90	0.09
	1.0	1.0	1.0	1.0	1.0	1.0	*0.9*	1.0	*1.0*	1.0
	1.0	1.0	1.0	1.0	1.0	1.0	*1.0*	1.0	*1.0*	1.0
1	1.0	2.0	2.0	2.0	2.0		2.0		2.0	1.
							30.20		28.80	
.	*0.09*	*4.50*	*4.50*	*4.50*	*4.50*	*4.50*	*4.25*	*0.90*	*0.90*	*0.09*
.	0.45	22.52	22.52	22.52	22.52	22.52	21.26	4.50	4.50	0.45
1.00E-06								1.00E-04		
3								1.64		
49								11.5		
16								3.7		
	8.8E-06	2.6E-05	1.9E-05	2.5E-05	1.1E-07	7.6E-05	0.0E+00	3.1E-06	1.7E-05	1.1E-05
	2.10E-07	3.5E-04	3.2E-04	2.6E-04	0.0E+00	2.3E-07	2.1E-04	3.1E-08	1.4E-06	2.31E-09
	8.98E-06	3.72E-04	3.38E-04	2.83E-04	1.12E-07	*2.9E-04*		*2.2E-05*		*1.1E-05*
1.72E-03										

U-235m	U-235	*Th-231*	Ra-226	Th-232
	488		100	37
0.45	2.20	2.20	0.45	0.16
0.09	0.44	0.44	0.09	0.03
1.0	1.0	*1.0*	1.0	1.0
1.0	1.0	*1.0*	1.0	1.0
.0		1.0	1.0	1.0
0.09	*0.44*	*0.44*	*0.09*	*0.03*
0.45	2.20	2.20	0.45	0.16

7.9E-13	3.4E-05	1.4E-06	2.7E-04	5.0E-05
0.00E+00	7.61E-06	6.78E-07	1.71E-05	8.18E-06
	4.4E-05		2.88E-04	5.86E-05

		Default
BPRG Calculator [Scenario = Resident, Media = Dust, BPRG Type = Site-Specific, Risk Output = Yes, Units = pCi]	DCGLw (dpm/100 cm^2)	
	DCGLw (pCi/cm^2)	
	Ingestion DCGLw (pCi/cm^2)	
	Yield	
	Equilibrium fraction	
	BPRG Output Option	1
	Half-life (yr)	
	Ingestion Input Concentration (pCi/cm^2)	.
	External Input Concentration (pCi/cm^2)	.
	Target risk	1.00E-06
	Frequency of hand to mouth - adult, FQa	3
	Surface area of fingers - resident child, SAres-c (cm2)	49
	Surface area of fingers - resident adult, SAres-a (cm2)	16
	Ingestion risk	
	External exposure risk (ground plane)	
	Total chain risk	
	Cumulative risk	*4.15E-02*

Output files: Resident_bprg_01OCT2019_All ROCs_EPA defaults_sec eq no decay

Am-241	Co-60	Eu-152	Eu-154	H-3	Cs-137	*Ba-137m*	Sr-90	*Y-90*	Pu-239
100	5000	5000	5000	5000	5000		1000		100
0.45	22.52	22.52	22.52	22.52	22.52	22.52	4.50	4.50	0.45
0.45	22.52	22.52	22.52	22.52	22.52	22.52	4.50	4.50	0.45
1.0	1.0	1.0	1.0	1.0	1.0	*0.944*	1	*0.998*	1
1.0	1.0	1.0	1.0	1.0	1.0	*1.000*	1	*1.0*	1
1	1	1	1	1	1		1		1
0.4505	*22.5225*	*22.5225*	*22.5225*	*22.5225*	*22.5225*	*21.2613*	*4.5045*	*4.4955*	*0.4505*
0.4505	22.523	22.523	22.523	22.523	22.5225	21.2613	4.5045	4.4955	0.4505
							1.00E-04		

2.30E-03	2.8E-03	4.4E-03	1.8E-03	6.5E-06	3.1E-03	2.0E-03	2.45E-03
5.67E-06	1.2E-03	5.8E-04	6.2E-04	0.0E+00	2.8E-04	1.9E-06	6.46E-06
2.31E-03	3.98E-03	4.93E-03	2.45E-03	6.48E-06	*3.35E-03*	*1.95E-03*	*2.46E-03*

7.94E+00	1.83E+00	3.91E+00	3.66E+00	7.93E+00	2.35E+02	6.97E+00

U-235m	U-235	*Th-231*	Ra-226	Th-232
	488		100	36.5
0.45	2.20	2.20	0.45	0.16
0.45	2.20	2.20	0.45	0.16
0.997	1.0	*1.0*	1.0	1.00
1.0	1.0	*1.0*	1.0	1.00
	1		1	1
0.4489	*2.1982*	*2.1982*	*0.4505*	*0.1644*
0.4489	2.1982	2.1982	0.4505	0.1644

	1.03E-02	8.21E-03	1.53E-03
	3.15E-05	1.71E-05	8.18E-06
	1.03E-02	8.23E-03	1.54E-03
	6.98E+00	2.63E+00	2.01E+00

ROC	2006 AM Structures RG, Total (dpm/100 cm2)	Navy Structures CSM (Indoor Worker Du External Risk	Navy Structures CSM (Indoor Worker Du Ingestion Risk	Navy Structures CSM (Indoor Worker Du Total Risk	BPRG: Navy Structures CSM (Resident Dust) External Risk	BPRG: Navy Structures CSM (Resident Dust) Ingestion Risk	BPRG: Navy Structures CSM (Resident Dust) Total Risk	BPRG: EPA Structures CSM (Resident Dust) External Risk	BPRG: EPA Structures CSM (Resident Dust) Ingestion Risk	BPRG: EPA Structures CSM (Resident Dust) Total Risk	RESRAD BUILD: Residential, Total Risk (from Battelle rpt)	EPA BPRG: RESRAD	Navy BPRG: EPA BPRG	RGs at 1E-4, Default BPRG	RF RGs at 1E-4, Default BPRG
Am-241	100	*4.8E-08*	*1.2E-06*	1.2E-06	*2.1E-07*	*8.8E-06*	9.0E-06	*5.7E-06*	*2.3E-03*	2.3E-03	1.30E-06	1774	257	4.3	4.3
Cs-137	5000	*5.0E-05*	*1.5E-05*	6.5E-05	*2.1E-04*	*7.6E-05*	2.9E-04	*2.8E-04*	*3.1E-03*	3.4E-03	4.10E-05	82	12	149.1	162.9
Co-60	5000	*8.2E-05*	*1.4E-06*	8.3E-05	*3.5E-04*	*2.6E-05*	3.7E-04	*1.2E-03*	*2.8E-03*	4.0E-03	2.40E-05	166	11	125.6	181.8
Eu-152	5000	*7.5E-05*	*1.0E-06*	7.6E-05	*3.2E-04*	*1.9E-05*	3.4E-04	*5.8E-04*	*4.4E-03*	4.9E-03	3.60E-05	137	15	101.5	114.9
Eu-154	5000	*6.1E-05*	*1.2E-06*	6.2E-05	*2.6E-04*	*2.5E-05*	2.8E-04	*6.2E-04*	*1.8E-03*	2.4E-03	3.10E-05	79	9	204.4	273.2
H-3	5000	*0.0E+00*	*1.4E-08*	1.4E-08	*0.0E+00*	*1.1E-07*	1.1E-07	*0.0E+00*	*6.5E-06*	6.5E-06	1.20E-09	5400	58	77160.5	77160.5
Pu-239	100	*5.3E-10*	*1.5E-06*	1.5E-06	*2.3E-09*	*1.1E-05*	1.1E-05	*6.5E-06*	*2.5E-03*	2.5E-03	1.60E-06	1535	227	4.1	4.1
Ra-226	100	*3.9E-06*	*3.0E-05*	3.4E-05	*1.7E-05*	*2.7E-04*	2.9E-04	*1.7E-05*	*8.2E-03*	8.2E-03	3.00E-06	2742	29	1.2	1.2
Sr-90	1000	*3.3E-07*	*1.2E-06*	1.5E-06	*1.4E-06*	*2.0E-05*	2.2E-05	*1.9E-06*	*2.0E-03*	2.0E-03	2.50E-07	7808	89	51.2	51.3
Th-232	36.5	*1.9E-06*	*4.3E-06*	6.1E-06	*8.2E-06*	*5.0E-05*	5.9E-05	*8.2E-06*	*1.5E-03*	1.5E-03	3.40E-06	452	26	2.4	2.4
U-235	488	*1.9E-06*	*3.1E-06*	5.0E-06	*8.3E-06*	*3.6E-05*	4.4E-05	*3.2E-05*	*1.0E-02*	1.0E-02	3.30E-06	3131	235	4.7	4.7
		2.8E-04	6.0E-05	3.4E-04	1.2E-03	5.4E-04	1.7E-03	2.8E-03	3.9E-02	4.2E-02					

Exceeds 1 x 10-2

Exceeds 1 x 10-3

Parameter	Default Value	Input Value (if not default)	
Select BPRG Type	Defaults	Site-specific	
Select Isotope Info Type	Database hierarchy defaults	User-provided for Cs, Co, Eu, H and Sr (to account for ingrowth of short half-life progeny of Cs and Sr)	
Select Risk Output	No	Yes	
Source and decay output	Secular equilibrium, without decay	Secular equilibrium (no decay)/Show individual progeny' for long-lived ROCs (Am, Pu, Ra, Th, U); 'Provide results for progeny (with decay)' for short-lived ROCs (Cs, Co, Eu, H, Sr)	
Radioactive Half-life			
Ba-137m	4.86E-06 yr	30.2 yr (accounts for continual ingrowth over exposure period)	
Y-90	7.32E-03 yr	28.8 yr (accounts for continual ingrowth over exposure period)	
Radionuclide concentrations (pCi/cm2)		Ingestion input concentrations are 20% of RG consistent with assumptions in	
Am-241	0.450	0.0901	0.090
Cs-137	22.523	4.505	4.505
Ba-137m (94.4%)	21.261	4.252	4.252
Co-60	22.523	4.505	4.505
Eu-152	22.523	4.505	4.505
Eu-154	22.523	4.505	4.505
H-3	22.523	4.505	4.505
Pu-329	0.450	0.0901	0.090
U-235m (99.7%)	0.450	0.0901	0.090
Ra-226+D	0.450	0.0901	0.090
Sr-90	4.505	0.9009	0.901
Y-90 (99.8%)	4.505	0.9009	0.901
Th-232+D	0.164	0.0329	0.033
U-235	2.198	0.4396	0.440
Th-231 (100%)	2.198	0.4396	0.440
Frequency of hand to mouth - adult, FQa	3	1.64 (Average for Age 7-26 from EPA 2000 page D-4). The BPRG default values for FQ (17 events/hr child and 3 events/hr adult) are based on the 2011 Exposure Factors Handbook Table 4-1. However, there is no data for adults	
Surface area of fingers - resident adult, SAres-a and indoor worker, Saiw	49 cm2	11.5 cm2 (Area of three fingertips from Sahmel et al.,2014 rather than full area of three fingers). The EPA default for saliva extraction factor is 50% based on pesticide studies in 1994. A 2014 study (Sahmel et al.) of transfer of lead to three fingers found the factor is 24% and is more applicable to the Navy contaminants. The authors note similar in 3rd para of their introduction. See	
Surface area of fingers - resident child, SAres-c	16 cm2	3.7 cm2 (Area of three fingertips calculated from ratio of adult fingertip to finger areas).	
Risks		Sum of ingestion and external exposure risks	
		Am risks from Am-241 only	
		Cs risks include Ba-137m (in secular equilbrium and half-life forced to that of	
		Co risks from Co-60 only	
		Eu risks from Eu-152 or Eu-154 only	
		H risks from H-3 only	
		Pu risks include U-235m	
		Ra and Th risks come from full secular equilibrium	

		Sr risks include Y-90 (in secular equilbrium and half-life forced to that of parent) U risks include Th-231	