Attachment 2

RADCALC Printout

Radcalc for Windows 2.11 Date: 05-01-00 15:40

Performed By: Brent C. Satterthwaite

Checked By: Gene K. Kenemoto

File: ARA-02.RAD

========== Input Information ==========

Source from input:

Radionuclide:	Curies:	Becquerels:	Grams:
Co-60	8.74E-011	3.23E+000	7.73E-014
Nb-95	2.72E-013	1.01E-002	6.92E-018
Tc-99	6.39E-011	2.36E+000	3.74E-009
Ag-108m	2.30E-013	8.51E-003	8.82E-015
Cs-134	4.04E-013	1.49E-002	3.12E-016
Cs-137	1.78E-010	6.59E+000	2.05E-012
Eu-152	3.52E-011	1.30E+000	1.99E-013
Eu-154	2.27E-012	8.40E-002	8.40E-015
Ra-226	8.96E-011	3.32E+000	9.06E-011
Th-228	7.57E-013	2.80E-002	9.24E-016
Th-230	4.50E-012	1.67E-001	2.18E-010
Th-232	5.29E-013	1.96E-002	4.82E-006
Th-234	1.42E-010	5.25E+000	6.13E-015
U-234	1.25E-009	4.62E+001	2.01E-007
U-235	1.20E-010	4.44E+000	5.45E-005
U-238	1.90E-010	7.03E+000	5.65E-004
Np-237	7.12E-013	2.63E-002	1.01E-009
Pu-238	3.75E-013	1.39E-002	2.21E-014
Pu-239	1.50E-012	5.55E-002	2.42E-011
Total Activity:	2.17E-009	8.02E+001	
Total Minus Daughters:	2.17E-009	8.02E+001	

Waste Form: Normal
Physical Form: Solid
Container Type: 30 Gallon Drum

Package Void Volume: 0.000 cc
Waste Volume: 0.000 cc
Waste Mass: 1.00 g
Waste Void Volume: 0.000 cc

Date to begin source decay: 9:00 Apr. 19, 2000
Date container sealed: 9:00 Apr. 19, 2000
Date container received: 9:00 Apr. 19, 2000
Days to decay source before seal time: 0.00 days
Days container is sealed: 0.00 days

Entered G Values:

G Alpha	G Beta	G Gamma
0	0	0

Comments:
ARA-02

========== Calculated Results ==========

DECAY HEAT:
Heat Generated at seal time: 4.89E-011 Watts

TRANSPORTATION:
Note: Transportation classifications assume three significant figures.
Calculations are made at user-specified decay time.

Radioactive: Yes (2.17E+000 nCi/g)
Effective A2 for Mixture: 0.0453 Ci
Type Determination: A (from unity fraction 4.7894E-008)
Limited Quantity: Yes

LSA-I Determination: *Yes (from LSA-I unity fraction 0.047894)
LSA-II Determination: *Yes (from LSA-II unity fraction 0.00047894)
LSA-III Determination: *Yes (from LSA-III unity fraction 2.3947E-005)
LSA-III also requires a leach test.
*Per 49CFR173.403. The user must check to be sure that all other conditions for LSA are met as found in 49CFR173.403 and 49CFR173.427.

HRC Quantity Determination: No

Fissile Quantity: 5.45E-005 g
Fissile Excepted: Yes
15g fissile radionuclides or less per 49CFR173.453(a)

LSA Container Category: III (Container Category per Reg Guide 7.11)

TRU Waste: No (Transuranic Waste per DOE Order 5820.2a)

Reportable Quantity: No (from RQ unity fraction 1.80E-008)

Source at start of seal time:

Radionuclide:	Curies:	Becquerels:	Grams:
Co-60	8.74E-011	3.23E+000	7.73E-014
Nb-95	2.72E-013	1.01E-002	6.92E-018
Tc-99	6.39E-011	2.36E+000	3.74E-009
Ag-108m	2.30E-013	8.51E-003	8.82E-015
Cs-134	4.04E-013	1.49E-002	3.12E-016
Cs-137	1.78E-010	6.59E+000	2.05E-012
Eu-152	3.52E-011	1.30E+000	1.99E-013
Eu-154	2.27E-012	8.40E-002	8.40E-015
Ra-226	8.96E-011	3.32E+000	9.06E-011
Th-228	7.57E-013	2.80E-002	9.24E-016
Th-230	4.50E-012	1.67E-001	2.18E-010
Th-232	5.29E-013	1.96E-002	4.82E-006
Th-234	1.42E-010	5.25E+000	6.13E-015
U-234	1.25E-009	4.62E+001	2.01E-007
U-235	1.20E-010	4.44E+000	5.45E-005
U-238	1.90E-010	7.03E+000	5.65E-004
Np-237	7.12E-013	2.63E-002	1.01E-009
Pu-238	3.75E-013	1.39E-002	2.21E-014
Pu-239	1.50E-012	5.55E-002	2.42E-011
Total Activity:	2.17E-009	8.02E+001	
Total Minus Daughters:	2.17E-009	8.02E+001	

Shipping Papers and Labels:

ISOTOPE	Number of A2s	Fraction of Total A2s	Cumulative Total A2s
* U-234	4.63E-008	9.67E-001	0.966645
Th-230	8.32E-010	1.74E-002	0.984012
Pu-239	2.77E-010	5.79E-003	0.989801
Ra-226	1.66E-010	3.46E-003	0.993259
Np-237	1.32E-010	2.75E-003	0.996007
Th-228	7.01E-011	1.46E-003	0.997471
Pu-238	6.93E-011	1.45E-003	0.998918
Th-234	2.62E-011	5.48E-004	0.999466
Cs-137	1.32E-011	2.75E-004	0.999741
Co-60	8.09E-012	1.69E-004	0.999910
Tc-99	2.63E-012	5.49E-005	0.999965
Eu-152	1.45E-012	3.02E-005	0.999995
Eu-154	1.68E-013	3.51E-006	0.999999
Cs-134	2.99E-014	6.25E-007	0.999999
Ag-108m	1.42E-014	2.96E-007	1.00000
Nb-95	1.01E-014	2.10E-007	1.00000
U-235	0.00E+000	0.00E+000	1.00000
Th-232	0.00E+000	0.00E+000	1.00000
U-238	0.00E+000	0.00E+000	1.00000

* Contains 95% of the total A2s and must be included per 49 CFR 173.433.

Liquid conversion

	pCi/L	Ci		3	Ci				
		in 1997	t1/2(years)	fraction	in2000		gallons		
Ag-108m	0	0	130	0.98413489	0				
co-60	18700	2.2085E-05	5.271	0.67406933	1.48868E-05		312		
Cs-134	213000	0.00025156	2.065	0.36539378	9.19169E-05			Conversion	
Cs-137	60900000	0.07192369	30.07	0.93319726	0.067118989			Factor from	
Eu-152	0	0	13.54	0.85766212	0			Gallons to Liters	
Eu-154	0	0	8.593	0.78510241	0		0.26418	Divide	
Zn-65	0	0	0.66794521	0.04448822	0				
Pu-238	1290	1.5235E-06	87.7	0.97657296	1.48782E-06				
Pu-239	2150	2.5392E-06	2.41E+04	0.99991374	2.53896E-06		1181.01295	Liters	
U-234	798	9.4245E-07	2.46E+05	0.99999155	9.4244E-07				
U-235	4.68	5.5271E-09	7.04E+08	1	5.52714E-09				
U-238	16	1.8896E-08	4.47E+09	1	1.88962E-08		density		
Am-241	1900	2.2439E-06	432.7	0.99520681	2.23317E-06		1		
	pCi/g						1181.01295	liters	
Sr-90	172000	0.20313423	28.78	0.93030977	0.188977755		1181012.95	grams	
H-3	301000	0.3554849	12.32	0.84472006	0.300285222				
								1E-12	

Radcalc for Windows 2.11 Date: 05-01-00 15:54

Performed By: Brent C. Satterthwaite

Checked By: Gene Kanemoto

File: PBFLIQ1.RAD

========== Input Information ==========

Source from input:

Radionuclide:	Curies:	Becquerels:	Grams:
H-3	3.55E-001	1.31E+010	3.67E-005
Co-60	2.20E-005	8.15E+005	1.95E-008
Sr-90	2.03E-001	7.50E+009	1.44E-003
Cs-134	2.51E-004	9.29E+006	1.94E-007
Cs-137	7.19E-002	2.66E+009	8.27E-004
U-234	9.42E-007	3.49E+004	1.52E-004
U-235	5.53E-009	2.05E+002	2.51E-003
U-238	1.89E-008	6.98E+002	5.61E-002
Pu-238	1.52E-006	5.62E+004	8.94E-008
Pu-239	2.53E-006	9.37E+004	4.09E-005
Am-241	2.24E-006	8.28E+004	6.53E-007
Total Activity:	6.30E-001	2.33E+010	
Total Minus Daughters:	6.30E-001	2.33E+010	

Waste Form: Normal
Physical Form: Liquid
Container Type: 30 Gallon Drum

	Entered Values:	Metric Values:
Package Void Volume:	0.000 cc	0.000 cc
Waste Volume:	1.18 m^3	1.18E+006 cc
Waste Mass:	1.18E+003 kg	1.18E+006 g
Waste Void Volume:	0.000 cc	0.000 cc

Date to begin source decay: 13:00 Apr. 19, 1997
Date container sealed: 13:00 Apr. 19, 2000
Date container received: 13:00 Apr. 19, 2000
Days to decay source before seal time: 3.0 years
Days container is sealed: 0.00 days

Entered G Values:

G Alpha	G Beta	G Gamma
0	0	0

Comments:
PBF liquid rad Calculation

========== Calculated Results ==========

DECAY HEAT:
Heat Generated at seal time: 0.00160 Watts

TRANSPORTATION:
Note: Transportation classifications assume three significant figures.
Calculations are made at user-specified decay time.

Radioactive: Yes (6.86E+002 nCi/g)
Effective A2 for Mixture: 7.28 Ci
Type Determination: A (from unity fraction 0.076331)
Limited Quantity: No

LSA-I Determination: *Yes (from LSA-I unity fraction 0.064784)
LSA-II Determination: *Yes (from LSA-II unity fraction 0.0064548)
LSA-III Determination: Not Applicable
*Per 49CFR173.403. The user must check to be sure that all other conditions for LSA are met as found in 49CFR173.403 and 49CFR173.427.

HRC Quantity Determination: No

Fissile Quantity: 0.00255 g
Fissile Excepted: Yes
15g fissile radionuclides or less per 49CFR173.453(a)
5g fissile radionuclides per 10 liters or less per 49CFR173.453(d)

LSA Container Category: III (Container Category per Reg Guide 7.11

TRU Waste: No (Transuranic Waste per DOE Order 5820.2a)

Reportable Quantity: Yes (from RQ unity fraction 1.96)

Source at start of seal time:

Radionuclide:	Curies:	Becquerels:	Grams:	
H-3	3.00E-001	1.11E+010	3.10E-005	
Co-60	1.48E-005	5.49E+005	1.31E-008	
Sr-90	1.89E-001	6.98E+009	1.34E-003	
Y-90	1.89E-001	6.98E+009	3.47E-007	(Daughter)
Cs-134	9.15E-005	3.39E+006	7.07E-008	
Cs-137	6.71E-002	2.48E+009	7.71E-004	
Ba-137m	6.35E-002	2.35E+009	1.18E-010	(Daughter)
U-234	9.42E-007	3.49E+004	1.52E-004	
Th-230	2.55E-011	9.42E-001	1.23E-009	
Ra-226	1.65E-014	6.12E-004	1.67E-014	
Rn-222	1.64E-014	6.06E-004	1.06E-019	(Daughter)
Po-218	1.64E-014	6.06E-004	5.88E-023	(Daughter)
Pb-214	1.64E-014	6.06E-004	4.99E-022	(Daughter)
Bi-214	1.64E-014	6.06E-004	3.71E-022	(Daughter)
Po-214	1.64E-014	6.06E-004	5.10E-029	(Daughter)
Pb-210	4.95E-016	1.83E-005	6.48E-018	
Bi-210	4.85E-016	1.80E-005	3.91E-021	(Daughter)
Po-210	2.98E-016	1.10E-005	6.64E-020	
U-235	5.53E-009	2.05E+002	2.51E-003	
Th-231	5.53E-009	2.05E+002	1.04E-014	(Daughter)
Pa-231	3.50E-013	1.30E-002	7.42E-012	
Ac-227	1.62E-014	5.99E-004	2.24E-016	
Th-227	1.52E-014	5.63E-004	4.95E-019	
Ra-223	1.48E-014	5.46E-004	2.88E-019	
Po-215	1.48E-014	5.46E-004	5.01E-028	(Daughter)
Pb-211	1.48E-014	5.46E-004	5.98E-022	(Daughter)
Bi-211	1.48E-014	5.46E-004	3.54E-023	(Daughter)
Tl-207	1.47E-014	5.44E-004	7.73E-023	(Daughter)
U-238	1.89E-008	6.98E+002	5.61E-002	
Th-234	1.89E-008	6.98E+002	8.14E-013	

Pa-234m	1.89E-008	6.98E+002	2.74E-017 (1
Pu-238	1.48E-006	5.49E+004	8.73E-008
Pu-239	2.53E-006	9.37E+004	4.09E-005
Am-241	2.23E-006	8.24E+004	6.50E-007
Np-237	2.17E-012	8.03E-002	3.08E-009
Pa-233	2.09E-012	7.75E-002	1.01E-016
U-233	1.33E-017	4.91E-007	1.37E-015
Total Activity:	8.08E-001	2.99E+010	
Total Minus Daughters:	5.56E-001	2.06E+010	

Shipping Papers and Labels:

	ISOTOPE	Number of A2s	Fraction of Total A2s	Cumulative Total A2s
*	Sr-90	6.99E-002	9.16E-001	0.915555
*	Cs-137	4.97E-003	6.51E-002	0.980677
	Pu-239	4.68E-004	6.13E-003	0.986811
	Am-241	4.12E-004	5.40E-003	0.992206
	H-3	2.77E-004	3.64E-003	0.995841
	Pu-238	2.74E-004	3.59E-003	0.999436
	U-234	3.49E-005	4.57E-004	0.999893
	Cs-134	6.78E-006	8.88E-005	0.999982
	Co-60	1.37E-006	1.80E-005	1.00000
	Th-230	4.71E-009	6.16E-008	1.00000
	Th-234	3.48E-009	4.57E-008	1.00000
	Np-237	4.01E-010	5.26E-009	1.00000
	Pa-231	2.16E-010	2.83E-009	1.00000
	Ac-227	2.99E-011	3.92E-010	1.00000
	Pa-233	8.62E-014	1.13E-012	1.00000
	Th-227	5.63E-014	7.38E-013	1.00000
	Ra-226	3.06E-014	4.01E-013	1.00000
	Ra-223	1.82E-014	2.38E-013	1.00000
	Pb-210	2.04E-015	2.67E-014	1.00000
	Po-210	5.51E-016	7.23E-015	1.00000
	U-233	4.92E-016	6.44E-015	1.00000
	Bi-214	0.00E+000	0.00E+000	1.00000
	U-235	0.00E+000	0.00E+000	1.00000
	Th-231	0.00E+000	0.00E+000	1.00000
	Po-215	0.00E+000	0.00E+000	1.00000
	Pb-211	0.00E+000	0.00E+000	1.00000
	Bi-211	0.00E+000	0.00E+000	1.00000
	Tl-207	0.00E+000	0.00E+000	1.00000
	U-238	0.00E+000	0.00E+000	1.00000
	Rn-222	0.00E+000	0.00E+000	1.00000
	Pa-234m	0.00E+000	0.00E+000	1.00000
	Bi-210	0.00E+000	0.00E+000	1.00000
	Ba-137m	0.00E+000	0.00E+000	1.00000
	Y-90	0.00E+000	0.00E+000	1.00000
	Po-218	0.00E+000	0.00E+000	1.00000
	Po-214	0.00E+000	0.00E+000	1.00000
	Pb-214	0.00E+000	0.00E+000	1.00000

* Contains 95% of the total A2s and must be included per 49 CFR 173.433.

Sludge conversion

	pCi/g in 1997	Ci in 1997	t1/2(years)		Ci in 2000	gallons	
Ag-108m	6800	1.38E-04	130	0.98413489	0.000135651		
Co-60	320000	6.49E-03	5.271	0.67406933	0.004372342	4.5	
Cs-134	38300	7.76E-04	2.065	0.36539378	0.000283674		Conversion
Cs-137	13300000	2.70E-01	30.07	0.93319726	0.251584937		Factor from
Eu-152	24900	5.05E-04	13.54	0.85766212	0.000432888		Gallons to Liters
Eu-154	9080	1.84E-04	8.593	0.78510241	0.000144501	0.26418	Divide
Zn-65	6560	1.33E-04	0.66794521	0.04448822	5.91573E-06		
Pu-238	28700	5.82E-04	87.7	0.97657296	0.000568128	1.70E+01	
Pu-239	28000	5.68E-04	2.41E+04	0.99991374	0.000567519		
U-234	38900	7.89E-04	2.46E+05	0.99999155	0.000788507	density	
U-235	229	4.64E-06	7.04E+08	1	0.000004642	1.19	
U-238	464	9.41E-06	4.47E+09	1	9.40541E-06		
Am-241	36400	7.38E-04	432.7	0.99520681	0.000734301		
						2.03E+04	g
Sr-90	638000	1.29E-02	28.78	0.93030977	0.012031168		
H-3	0		12.32	0.84472006		1.00E-12	

Radcalc for Windows 2.11 Date: 05-31-00 07:00

Performed By: Brent C. Satterthwaite

Checked By: Gene K Kanemoto

File: PBFSOL2.RAD

========== Input Information ==========

Source from input:

Radionuclide:	Curies:	Becquerels:	Grams:
Co-60	6.49E-003	2.40E+008	5.74E-006
Zn-65	1.33E-004	4.92E+006	1.61E-008
Sr-90	1.29E-002	4.77E+008	9.14E-005
Ag-108m	1.38E-004	5.11E+006	5.29E-006
Cs-134	7.76E-004	2.87E+007	6.00E-007
Cs-137	2.69E-001	9.95E+009	3.09E-003
Eu-152	5.05E-004	1.87E+007	2.86E-006
Eu-154	1.84E-004	6.81E+006	6.81E-007
U-234	7.88E-004	2.92E+007	1.27E-001
U-235	4.64E-006	1.72E+005	2.11E+000
U-238	9.40E-006	3.48E+005	2.80E+001
Pu-238	5.82E-004	2.15E+007	3.42E-005
Pu-239	5.68E-004	2.10E+007	9.16E-003
Am-241	7.38E-004	2.73E+007	2.15E-004
Total Activity:	2.93E-001	1.08E+010	
Total Minus Daughters:	2.93E-001	1.08E+010	

Waste Form: Normal
Physical Form: Liquid
Container Type: 30 Gallon Drum

Package Void Volume: 0.000 cc
Waste Volume: 1.70E+004 cc
Waste Mass: 2.02E+004 g
Waste Void Volume: 0.000 cc

Date to begin source decay: 14:00 Apr. 19, 1997
Date container sealed: 14:00 Apr. 19, 2000
Date container received: 14:00 Apr. 19, 2000
Days to decay source before seal time: 3.0 years
Days container is sealed: 0.00 days

Entered G Values:

G Alpha	G Beta	G Gamma
0	0	0

Comments:
PBF Rad Classification for sludge
Version 2 with 229 pci/g of U-235 per Wells letter of
5/25/00 @ 15:01 to gkk@inel.gov

========== Calculated Results ==========

DECAY HEAT:
Heat Generated at seal time: 0.00145 Watts

TRANSPORTATION:

Note: Transportation classifications assume three significant figures. Calculations are made at user-specified decay time.

Radioactive:	Yes (2.58E+004 nCi/g)
Effective A2 for Mixture:	0.680 Ci
Type Determination:	A (from unity fraction 0.39849)
Limited Quantity:	No
LSA-I Determination:	No (from LSA-I unity fraction 19.727)
LSA-II Determination:	No (from LSA-II unity fraction 1.9727)
LSA-III Determination:	Not Applicable
HRC Quantity Determination:	No
Fissile Quantity:	2.12 g
Fissile Excepted:	Yes

15g fissile radionuclides or less per 49CFR173.453(a)
5g fissile radionuclides per 10 liters or less per 49CFR173.453(d)

Container Category:	III (Container Category per Reg Guide 7.11)
TRU Waste:	No (Transuranic Waste per DOE Order 5820.2a)
Reportable Quantity:	No (from RQ unity fraction 0.567)

Source at start of seal time:

Radionuclide:	Curies:	Becquerels:	Grams:	
Co-60	4.37E-003	1.62E+008	3.87E-006	
Zn-65	5.90E-006	2.18E+005	7.16E-010	
Sr-90	1.20E-002	4.44E+008	8.51E-005	
Y-90	1.20E-002	4.45E+008	2.21E-008	(Daughter)
Ag-108m	1.36E-004	5.02E+006	5.21E-006	
Ag-108	1.21E-005	4.47E+005	1.64E-014	(Daughter)
Cs-134	2.83E-004	1.05E+007	2.19E-007	
Cs-137	2.51E-001	9.29E+009	2.89E-003	
Ba-137m	2.37E-001	8.78E+009	4.41E-010	(Daughter)
Eu-152	4.33E-004	1.60E+007	2.46E-006	
Eu-154	1.44E-004	5.35E+006	5.35E-007	
U-234	7.88E-004	2.92E+007	1.27E-001	
Th-230	2.13E-008	7.88E+002	1.03E-006	
Ra-226	1.38E-011	5.12E-001	1.40E-011	
Rn-222	1.37E-011	5.07E-001	8.90E-017	(Daughter)
Po-218	1.37E-011	5.07E-001	4.92E-020	(Daughter)
Pb-214	1.37E-011	5.06E-001	4.17E-019	(Daughter)
Bi-214	1.37E-011	5.06E-001	3.10E-019	(Daughter)
Po-214	1.37E-011	5.06E-001	4.26E-026	(Daughter)
Pb-210	4.14E-013	1.53E-002	5.42E-015	
Bi-210	4.06E-013	1.50E-002	3.27E-018	(Daughter)
Po-210	2.49E-013	9.23E-003	5.55E-017	
U-235	4.64E-006	1.72E+005	2.11E+000	
Th-231	4.64E-006	1.72E+005	8.73E-012	(Daughter)
Pa-231	2.94E-010	1.09E+001	6.23E-009	
Ac-227	1.36E-011	5.03E-001	1.88E-013	
Th-227	1.28E-011	4.73E-001	4.16E-016	
Ra-223	1.26E-011	4.65E-001	2.45E-016	

Po-215	1.26E-011	4.65E-001	4.26E-025	(Daughter)
Pb-211	1.26E-011	4.65E-001	5.09E-019	(Daughter)
Bi-211	1.26E-011	4.65E-001	3.02E-020	(Daughter)
Tl-207	1.25E-011	4.64E-001	6.58E-020	(Daughter)
Fr-223	1.88E-013	6.94E-003	4.85E-021	(Daughter)
U-238	9.40E-006	3.48E+005	2.80E+001	
Th-234	9.40E-006	3.48E+005	4.06E-010	
Pa-234m	9.40E-006	3.48E+005	1.37E-014	(Daughter)
Pu-238	5.68E-004	2.10E+007	3.34E-005	
Pu-239	5.68E-004	2.10E+007	9.16E-003	
Am-241	7.34E-004	2.72E+007	2.14E-004	
Np-237	7.16E-010	2.65E+001	1.02E-006	
Pa-233	6.90E-010	2.55E+001	3.33E-014	
U-233	4.38E-015	1.62E-004	4.51E-013	
Th-229	4.00E-019	1.48E-008	1.88E-018	
Total Activity:	5.21E-001	1.93E+010		
Total Minus Daughters:	2.71E-001	1.00E+010		

Shipping Papers and Labels:

ISOTOPE	Number of A2s	Fraction of Total A2s	Cumulative Total A2s
* Am-241	1.36E-001	3.41E-001	0.340681
* Pu-238	1.05E-001	2.64E-001	0.604321
* Pu-239	1.05E-001	2.63E-001	0.867768
* U-234	2.92E-002	7.32E-002	0.941006
* Cs-137	1.86E-002	4.67E-002	0.987660
Sr-90	4.45E-003	1.12E-002	0.998823
Co-60	4.05E-004	1.02E-003	0.999839
Cs-134	2.10E-005	5.26E-005	0.999892
Eu-152	1.78E-005	4.48E-005	0.999937
Eu-154	1.07E-005	2.69E-005	0.999964
Ag-108m	8.38E-006	2.10E-005	0.999985
Th-230	3.93E-006	9.87E-006	0.999995
Th-234	1.74E-006	4.36E-006	0.999999
Pa-231	1.82E-007	4.56E-007	1.00000
Np-237	1.32E-007	3.32E-007	1.00000
Zn-65	1.09E-007	2.74E-007	1.00000
Ac-227	2.51E-008	6.31E-008	1.00000
Th-227	4.73E-011	1.19E-010	1.00000
Pa-233	2.84E-011	7.13E-011	1.00000
Ra-226	2.56E-011	6.41E-011	1.00000
Ra-223	1.55E-011	3.89E-011	1.00000
Pb-210	1.70E-012	4.27E-012	1.00000
Po-210	4.61E-013	1.16E-012	1.00000
U-233	1.62E-013	4.07E-013	1.00000
Th-229	4.93E-016	1.24E-015	1.00000
Pb-214	0.00E+000	0.00E+000	1.00000
Bi-214	0.00E+000	0.00E+000	1.00000
Bi-210	0.00E+000	0.00E+000	1.00000
Po-215	0.00E+000	0.00E+000	1.00000
Pb-211	0.00E+000	0.00E+000	1.00000

Bi-211	0.00E+000	0.00E+000	1.00000
Tl-207	0.00E+000	0.00E+000	1.00000
Fr-223	0.00E+000	0.00E+000	1.00000
U-238	0.00E+000	0.00E+000	1.00000
Y-90	0.00E+000	0.00E+000	1.00000
Pa-234m	0.00E+000	0.00E+000	1.00000
Po-218	0.00E+000	0.00E+000	1.00000
Ag-108	0.00E+000	0.00E+000	1.00000
Ba-137m	0.00E+000	0.00E+000	1.00000
Rn-222	0.00E+000	0.00E+000	1.00000
Po-214	0.00E+000	0.00E+000	1.00000
Th-231	0.00E+000	0.00E+000	1.00000
U-235	0.00E+000	0.00E+000	1.00000

* Contains 95% of the total A2s and must be included per 49 CFR 173.433.