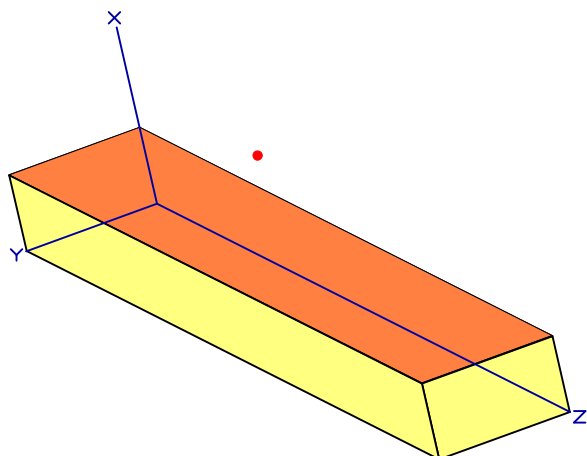


MicroShield v5.05 (5.05-00473)
American Ecology

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File Ref: _____
 Date: _____
 By: _____
 Checked: _____

Case Title: MKM excavator op
Description: DU, U-238-124pCi/g, U-234-20 pCi/g, U-235-5 pCi/g
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	152.4 cm	5 ft 0.0 in
Width	1.8e+3 cm	60 ft
Height	274.32 cm	9 ft

Dose Points

	<u>X</u>	<u>Y</u>	<u>Z</u>
# 1	3.54e+02 cm	137.16 cm	914.4 cm
	11 ft 7.2 in	4 ft 6.0 in	30 ft

Shields

<u>Shield Name</u>	<u>Dimension</u>	<u>Material</u>	<u>Density</u>
Source	2700.0 ft ³	Concrete	1.5
Shield 1	.041 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input

Grouping Method : Standard Indices

Number of Groups : 25

Lower Energy Cutoff : 0.015

Photons < 0.015 : Excluded

Library : Grove

<u>Nuclide</u>	<u>curies</u>	<u>becquerels</u>	<u>uCi/cm³</u>	<u>Bq/cm³</u>
Ac-227	7.5320e-010	2.7868e+001	9.8515e-012	3.6450e-007
Bi-210	3.4682e-013	1.2832e-002	4.5363e-015	1.6784e-010
Bi-211	6.6883e-010	2.4747e+001	8.7480e-012	3.2368e-007
Bi-214	1.7610e-011	6.5159e-001	2.3034e-013	8.5225e-009
Fr-223	1.0394e-011	3.8456e-001	1.3594e-013	5.0299e-009
Pa-231	2.4214e-008	8.9590e+002	3.1670e-010	1.1718e-005
Pa-234	2.2753e-005	8.4187e+005	2.9760e-007	1.1011e-002
Pa-234m	1.4221e-002	5.2617e+008	1.8600e-004	6.8820e+000
Pb-210	3.5725e-013	1.3218e-002	4.6727e-015	1.7289e-010
Pb-211	6.6883e-010	2.4747e+001	8.7480e-012	3.2368e-007
Pb-214	1.7611e-011	6.5162e-001	2.3035e-013	8.5229e-009
Po-210	1.7525e-013	6.4841e-003	2.2921e-015	8.4809e-011
Po-211	1.8259e-012	6.7559e-002	2.3882e-014	8.8363e-010
Po-214	1.7607e-011	6.5145e-001	2.3029e-013	8.5207e-009
Po-215	6.6891e-010	2.4750e+001	8.7490e-012	3.2371e-007
Po-218	1.7616e-011	6.5180e-001	2.3041e-013	8.5253e-009
Ra-223	6.6891e-010	2.4750e+001	8.7490e-012	3.2371e-007
Ra-226	1.7884e-011	6.6172e-001	2.3392e-013	8.6550e-009
Rn-219	6.6891e-010	2.4750e+001	8.7490e-012	3.2371e-007
Rn-222	1.7616e-011	6.5181e-001	2.3041e-013	8.5253e-009
Th-227	6.9031e-010	2.5541e+001	9.0289e-012	3.3407e-007
Th-230	4.1295e-008	1.5279e+003	5.4012e-010	1.9984e-005
Th-231	5.7342e-004	2.1216e+007	7.5000e-006	2.7750e-001
Th-234	1.4221e-002	5.2617e+008	1.8600e-004	6.8820e+000

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<u>Nuclide</u>	<u>curies</u>	<u>becquerels</u>	<u>µCi/cm³</u>	<u>Bq/cm³</u>
Tl-207	6.6700e-010	2.4679e+001	8.7240e-012	3.2279e-007
U-234	2.2937e-003	8.4868e+007	3.0001e-005	1.1100e+000
U-235	5.7342e-004	2.1216e+007	7.5000e-006	2.7750e-001
U-238	1.4221e-002	5.2617e+008	1.8600e-004	6.8820e+000

Buildup
The material reference is : Source

Integration Parameters

X Direction	20
Y Direction	20
Z Direction	20

Results

<u>Energy</u>	<u>Activity</u>	<u>Fluence Rate</u>	<u>Fluence Rate</u>	<u>Exposure Rate</u>	<u>Exposure Rate</u>
<u>MeV</u>	<u>photons/sec</u>	<u>MeV/cm²/sec</u>	<u>MeV/cm²/sec</u>	<u>mR/hr</u>	<u>mR/hr</u>
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.015	3.991e+04	2.807e-252	2.286e-30	2.408e-253	1.961e-31
0.02	3.190e+00	3.793e-121	2.875e-34	1.314e-122	9.959e-36
0.03	3.109e+06	5.995e-40	6.196e-28	5.941e-42	6.141e-30
0.04	1.032e+03	1.183e-23	4.664e-23	5.233e-26	2.063e-25
0.05	1.001e+05	3.480e-14	2.278e-13	9.271e-17	6.068e-16
0.06	2.070e+07	2.125e-08	1.937e-07	4.221e-11	3.847e-10
0.08	3.237e+06	3.035e-06	3.379e-05	4.802e-09	5.347e-08
0.1	3.455e+07	4.829e-04	5.308e-03	7.388e-07	8.121e-06
0.15	3.570e+06	5.752e-04	5.062e-03	9.473e-07	8.335e-06
0.2	1.327e+07	5.446e-03	4.035e-02	9.612e-06	7.122e-05
0.3	6.122e+04	6.502e-05	3.813e-04	1.233e-07	7.233e-07
0.4	5.170e+04	9.820e-05	4.891e-04	1.913e-07	9.530e-07
0.5	7.677e+04	2.245e-04	9.855e-04	4.407e-07	1.934e-06
0.6	3.137e+05	1.297e-03	5.133e-03	2.531e-06	1.002e-05
0.8	1.747e+06	1.241e-02	4.211e-02	2.361e-05	8.010e-05
1.0	5.585e+06	6.026e-02	1.829e-01	1.111e-04	3.371e-04
1.5	1.178e+05	2.694e-03	6.802e-03	4.533e-06	1.144e-05
2.0	1.520e+04	5.811e-04	1.320e-03	8.987e-07	2.041e-06
TOTALS:	8.654e+07	8.414e-02	2.908e-01	1.547e-04	5.320e-04