



LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

LLNL-TR-814785

***Total Residual Radiation Source Term Produced
by the Hiroshima Detonation***

**Gregory D. Spriggs (LLNL) and
Stephen D. Egbert (SAIC)**

February 22, 2017

Disclaimer

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor Lawrence Livermore National Security, LLC, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or Lawrence Livermore National Security, LLC. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the Lawrence Livermore National Security, LLC, and shall not be used for advertising or product endorsement purposes.

Auspices Statement

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344

ABSTRACT

Residual radiation from a nuclear detonation consists of *fission products* and *activation products* produced by the excess neutrons released during the explosion. The ability to accurately predict nuclear fallout begins with a calculation of the residual radiation source term. The intent of this paper is to define the residual radiation source term for the Hiroshima detonation. The calculation was performed using the Livermore Weapon Activation Code (LWAC), which is a simplified three-region model that estimates the residual radiation associated with the fission products, the unburnt fuel, and activation products produced in the weapon components, the surrounding air, and the ground in the vicinity of ground zero. For the Hiroshima detonation, ~1200 radionuclides were produced. A time-dependent solution for the total activity of each of the major residual radiation source terms is provided in the Appendices. In addition, the time-dependent exposure rates produced by the activation rings are included in the report.

Table of Contents

INTRODUCTION.....	5
NUCLEAR FALLOUT REGIMES	7
NUCLEAR FALLOUT REGIME FOR HIROSHIMA	8
HIROSHIMA RESIDUAL RADIATION SOURCE	9
HIROSHIMA GROUND SOURCE	14
HIROSHIMA ACTIVATION RINGS	15
HIROSHIMA LOFTED GROUND SOURCE	19
CONCLUSIONS	22
REFERENCES.....	24
APPENDIX A. LIST OF RESIDUAL RADIONUCLIDES	25
APPENDIX B. AIR ACTIVATION SOURCE.....	126
APPENDIX C. BOMB COMPONENT ACTIVATION SOURCE	227
APPENDIX D. FISSION PRODUCT SOURCE	328
APPENDIX E. ACTINIDE SOURCE.....	429

Total Residual Radiation Source Term Produced by the Hiroshima Detonation

Gregory D. Spriggs and Stephen D. Egbert

Introduction

The residual radiation source term produced by a nuclear detonation can be divided into several categories:

- Fission products
- Unburnt nuclear fuel (e.g., U or Pu)
- Neutron-activated bomb components
- Neutron-activated air
- Neutron-activated soil in the vicinity of ground zero

In most cases, the fission product source term represents the vast majority of the residual radiation produced by a nuclear detonation. The fission products are usually located in the cap of the mushroom cloud. This radiation source term may or may not produce *local* fallout depending on the *scaled-height-of-burst* (SHOB¹). As a general rule-of-thumb, if the fireball does not touch the surface, then very little, if any, fission products will contribute to local fallout unless there is a significant amount of *rainout*.

Since a nuclear detonation does not burn all of the nuclear fuel within the weapon, there will always be *unburnt* and/or *transmuted* nuclear fuel that will be mixed in with the fission products. The residual radiation produced by the unburnt and/or transmuted fuel is usually negligible relative to the fission products, but can last for thousands of years and may result in the spread of hazardous actinides throughout the environment.

When fissions occur within a nuclear weapon, an average of ~2.6 neutrons are released per fission. Since it only takes one neutron to produce the next fission, an excess of ~1.6 neutrons are floating around in the system that can either be absorbed in the weapon components or leak from the weapon. For those neutrons that are absorbed in the weapon components, another residual radiation source is created by those absorptions that produce a radionuclide. As with the fission products and the unburnt fuel, this residual radiation source term is usually confined to the cap of the mushroom cloud.

The excess neutrons that leak from the weapon will diffuse through the atmosphere. If the detonation occurs well above the ground, the vast majority of the leakage neutrons will be absorbed in the atmosphere immediately surrounding the detonation point, thus creating another residual radiation source. The radionuclides in this source term are in the form of atmospheric gases. As such, they don't settle out of the

¹ SHOB is defined as the actual height-of-burst divided by the yield/air density to the 1/3 power.

atmosphere per se, but they can produce *sky-shine* that can create an exposure on the surface.

If the detonation occurs close to the ground, the neutrons that leak from the weapon will enter the ground in the vicinity of ground zero and will activate the soil, thus creating another residual radiation source term. This source term can be divided into two components: *lofted* and *fixed*.

The *lofted* component consists of radionuclides drawn off of the surface by the *draft* of the buoyant fireball produced by the detonation (see Figure 1). The exact amount of the ground source that is lofted is highly dependent on the type of surface (e.g., loose soil, gravel, asphalt, etc.) at ground zero and the SHOB. When the SHOB is relatively high or the surface is relatively rigid, only a small percentage of the activated soil is lofted. When the SHOB is relatively low or the surface is relatively loose, large craters will form and most of the neutron-activated soil is lofted.

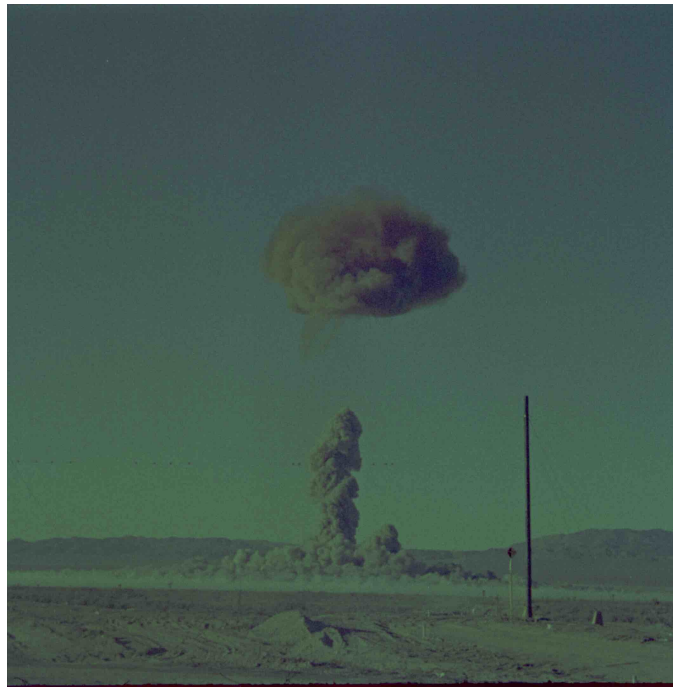


Figure 1. This is an example of a detonation (Baker_BJ) with a SHOB that is very similar to Hiroshima. The photo, taken at ~17 seconds after the detonation, shows the formation of the cap of the mushroom cloud, which contains fission products, unburnt fuel, and neutron-activated bomb components. It also shows the formation of the dust stem and the base, which contain neutron-activated soil.

The *fixed* component consists of those radionuclides that are not lofted during the detonation. Most of these radionuclides are contained within the first ~20 cm thick region just below the surface and they remain *fixed* at the position where they were created. The subsequent decay of these radionuclides produce *activation rings* (i.e, iso-contours of dose or exposure rates) centered about ground zero (see Figure 2).

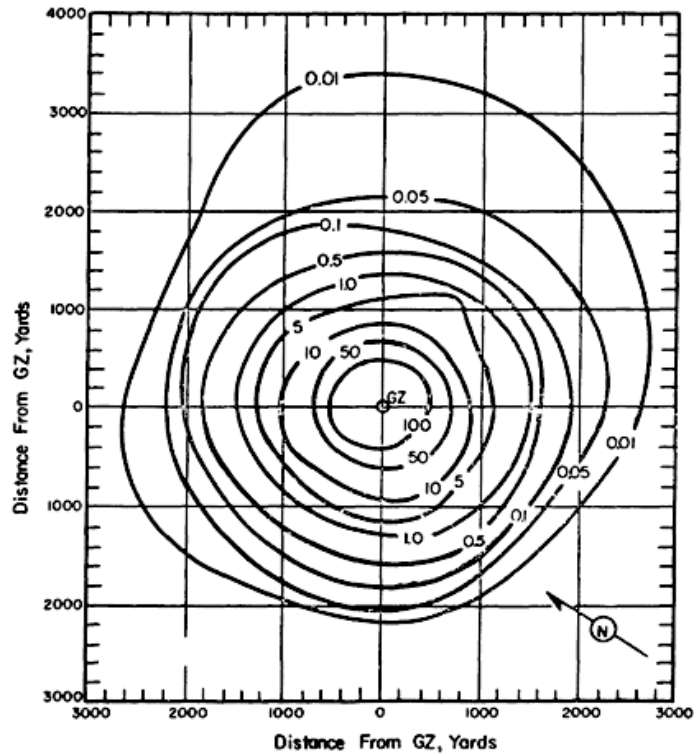


Figure 2. This is an example of activation rings produced by neutron-activation of the soil in the vicinity of ground zero.

Nuclear Fallout Regimes

The scaled-height-of-burst (SHOB) is defined as

$$SHOB = HOB \left(\frac{\rho_0}{Y} \right)^{1/3},$$

where HOB is the actual height-of-burst, and Y is the weapon yield (kt). This quantity is used to correlate a wide variety of nuclear weapon effects.

For nuclear fallout, the SHOB is used to define several different fallout regimes that are characterized by the unique distribution of the residual radiation source term within the mushroom cloud and the unique particle-size-distribution within each part of the cloud (see Figure 3). In general, if two detonations have similar SHOB's, then the formation of the cloud and the distribution of the residual radiation source term within the cloud will be similar.

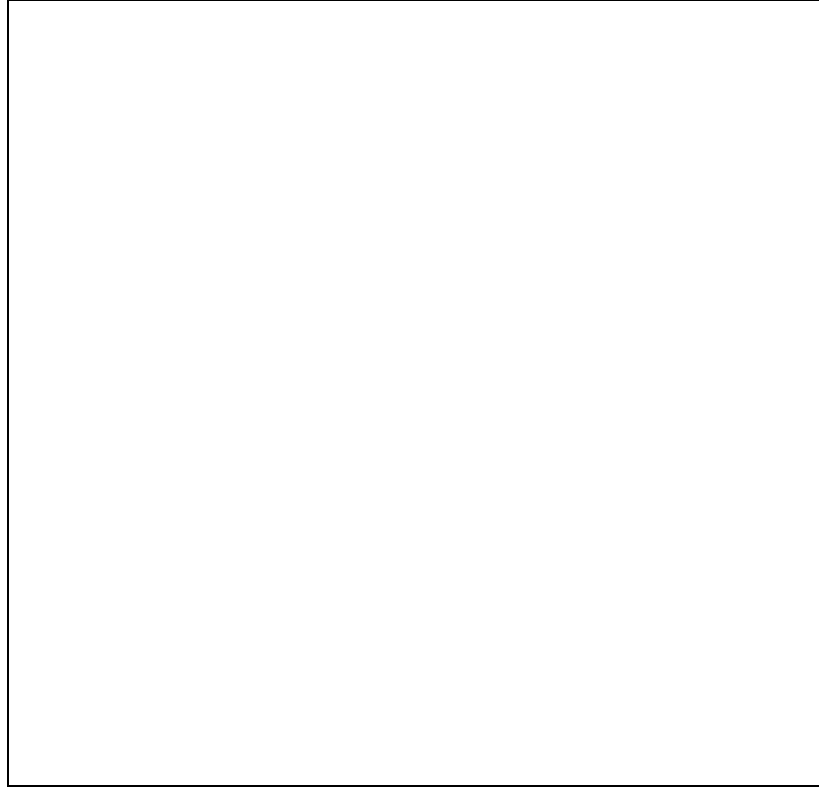


Figure 3. Nuclear Fallout Regimes (Spriggs, 2004).

Nuclear Fallout Regime for Hiroshima

In accordance to Young (2007), Hiroshima had a yield of ~ 16 KT and detonated at ~ 1969 ft (600 m) where the air density was 1.11 kg/m^3 . This corresponds to an SHOB of 809 *scaled feet* (247 *scaled meters*). This places the Hiroshima detonation in the lower end of Regime 2 (see Figure 3).

Regime 2 clouds are characterized by fireballs that do not interact with the surface. Furthermore, for all SHOB's greater than 450 scaled feet, a *gap* forms between the cap and the stem. This gap is an important indication that the residual radiation in the cap and the stem did not co-mingle during the condensation phase of the bomb debris. Hence, the residual radiation source terms associated with the fission products, unburnt fuel, and neutron-activated bomb components are located in the cap, and the residual radiation source term associated with the neutron-activated soil is located in the stem.

Regime 2 clouds also have very distinct particle-size distributions. Since there is no carrier material in the fireball during the condensation phase, the bomb debris condenses into very small particles with a mean size of ~ 200 nanometers. These small submicron-size particles make the cloud cap appear *white* in a photograph. In contrast, the mean particle size in the stem is nearly identical to the *native* particle-size distribution of the soil located in the vicinity of ground zero. These particles can range in size from a few microns (i.e., clays and silts) to several centimeters in diameter (i.e., gravel). As a

result, the stem will have a distinctively darker color associated with the color of the soil. As seen in Figure 4, the Hiroshima cloud, photographed several minutes after the detonation, exhibits a relatively large gap between a white cap and a darker stem. This is typical of a Regime 2 cloud.

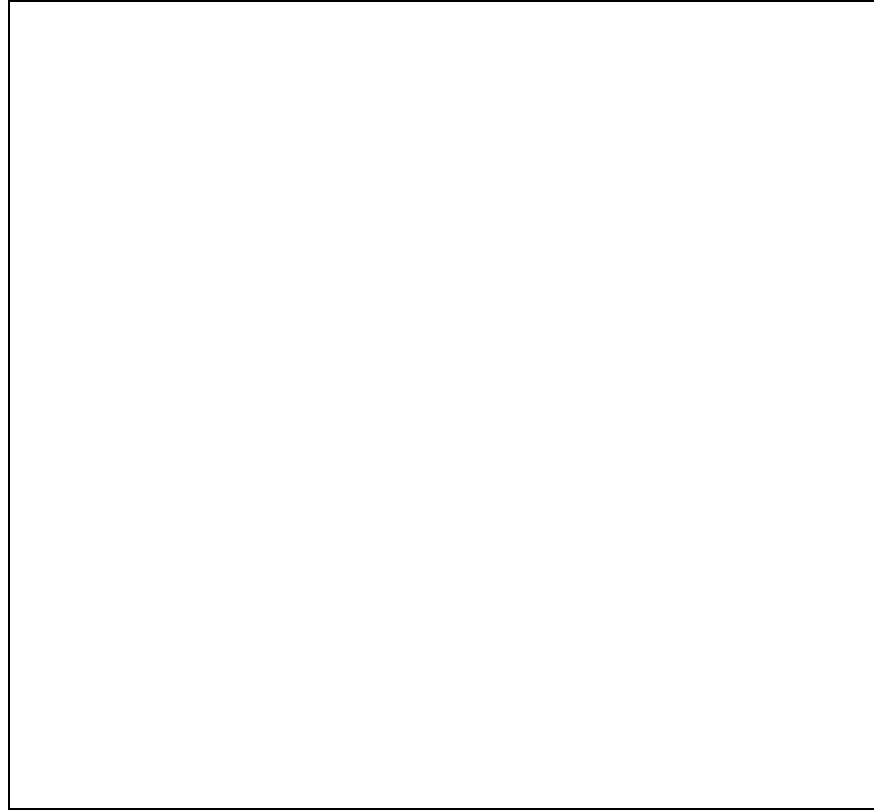


Figure 4. Photo of Hiroshima mushroom cloud several minutes after the detonation.

The most important characteristic of a Regime 2 cloud is the source of the local fallout. Even though the residual radiation source term in the cap is relatively large compared to the other source terms, the very low settling rates of the submicron-size particles keep the radiation lofted for several years. In contrast, it only takes a few minutes for the relatively larger particles in the stem to settle out. *As a result, local fallout from a Regime 2 detonation is caused primarily from lofted neutron-activated soil.*

Hiroshima Residual Radiation Source

The total residual radiation source term for Hiroshima was calculated using the Livermore Weapon Activation Code (LWAC) (Spriggs, 2010). In this calculation, a prompt fission spectrum with an average energy of 1.46 MeV (see Figure 5) was used to estimate the fission-product yield curve, which, in turn, was used to determine which fission product radionuclides would be formed. The same spectrum was used to calculate

the activation of the bomb components, which was assumed to be ~92% high-alloy steel and ~8% tungsten carbide.

The air and the soil in the vicinity of ground zero (GZ) were activated using a few-group representation of the leakage spectrum (Egbert, 2007). The average neutron energy for this spectrum was ~0.31 MeV (see Figure 5).

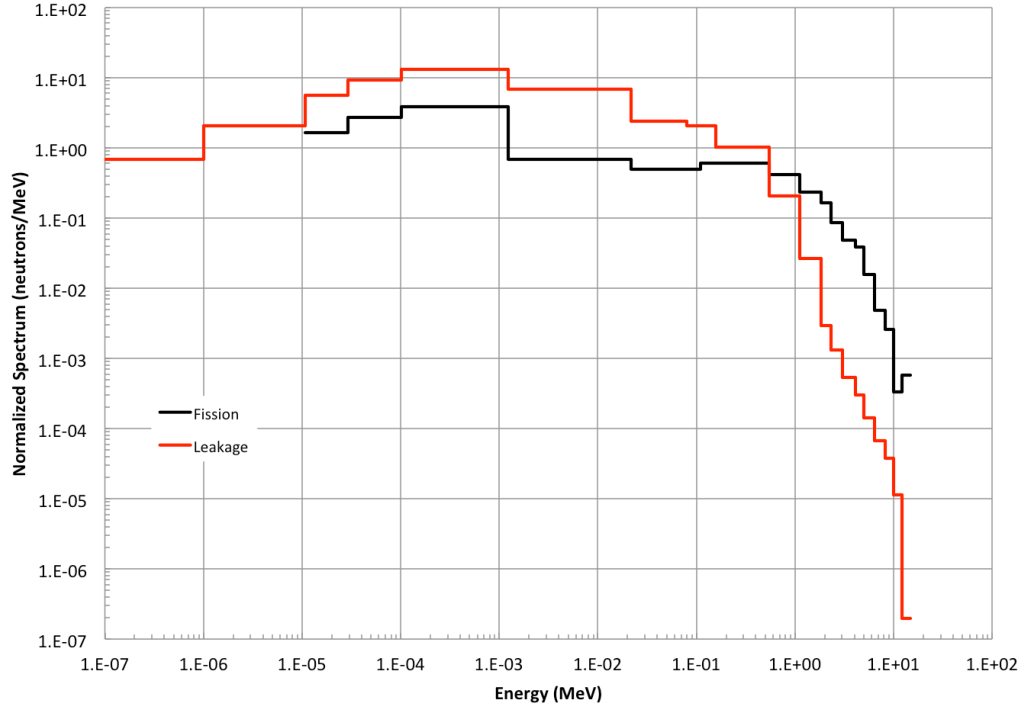


Figure 5. This is a plot of the neutron spectra (normalized to 1 neutron) that was used to estimate the residual radiation source term for the Hiroshima detonation. The average neutron energy of the prompt fission spectrum was 1.46 MeV and the average neutron energy of the leakage spectrum was 0.31 MeV. The prompt fission spectrum was used to estimate the fission-product yield curve, which is used to determine the radionuclides in the fission product source term. The leakage spectrum was used to calculate the air-activation source term and the ground-activation source term.

The parameters in the two-group, neutron-transport model used in LWAC were adjusted such that the total neutron fluence would agree with the ATR7 calculations performed by Egbert (2007). These results are in general agreement with the results reported in DS02 (Young, 2005), but do not include the angular dependence of the fluence. The actual value of the neutron fluence is relatively unimportant in the LWAC model. LWAC uses a *neutron balance scheme* to determine how many radionuclides are produced in the ground and then uses the *shape* of the neutron fluence to determine how those radionuclides are distributed along the ground surface. Hence, whether the LWAC calculation uses the ATR7 or DS02 neutron fluences is unimportant since they both have the same general shape.

A comparison between the ATR7 and LWAC results is shown in Figure 6. Note, that the curves in Figure 6 have been normalized to 1 neutron. To convert to an absolute

fluence, the y-axis should be multiplied by the total number of neutrons that leaked from the weapon. According to DS02 (Young, 2005), this number corresponds to $\sim 1.71 \times 10^{24}$, which represents $\sim 49\%$ of the initial excess neutrons produced by the detonation.

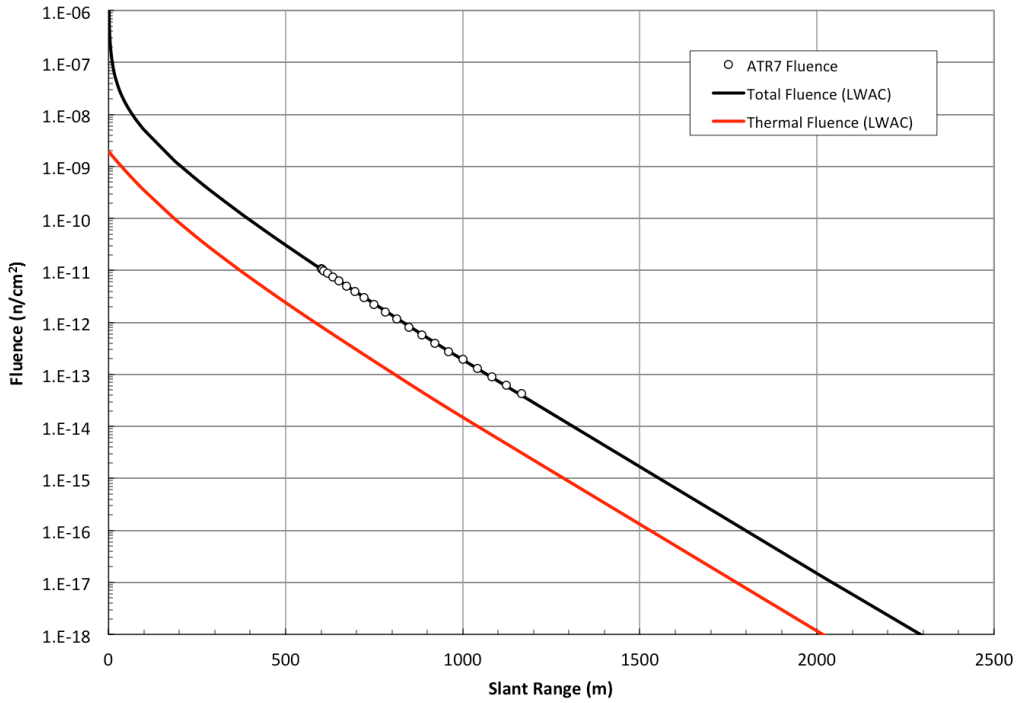


Figure 6. Plot of the total and thermal fluence predicted by the LWAC model compared to the total fluence calculated using ATR7 (Egbert, 2007) and reported in DS02 (Young, 2002).

A summary of the neutron economy for the Hiroshima detonation is given in Table 1. These results are based on an average of 2.626 neutrons released per fission and 1.4318×10^{23} fissions per kt. As can be noted from this table, the vast majority of the neutrons produced by the detonation were absorbed in either the fuel, in the bomb components, or in the surrounding air. Only a small fraction of the neutrons were absorbed in the ground beneath the detonation.

Table 1. Neutron Economy

<i>Component</i>	<i>Neutrons Absorbed</i>	<i>%</i>
Fissions process	2.291×10^{24}	38.08
Non-fission absorptions in fuel	2.406×10^{23}	4.00
Absorptions in Bomb Components	1.777×10^{24}	29.54
Absorptions in Air	1.705×10^{24}	28.34
Absorptions in Ground	2.929×10^{21}	~ 0.05
<i>Total Neutron Source</i>	6.016×10^{24}	~ 100.00

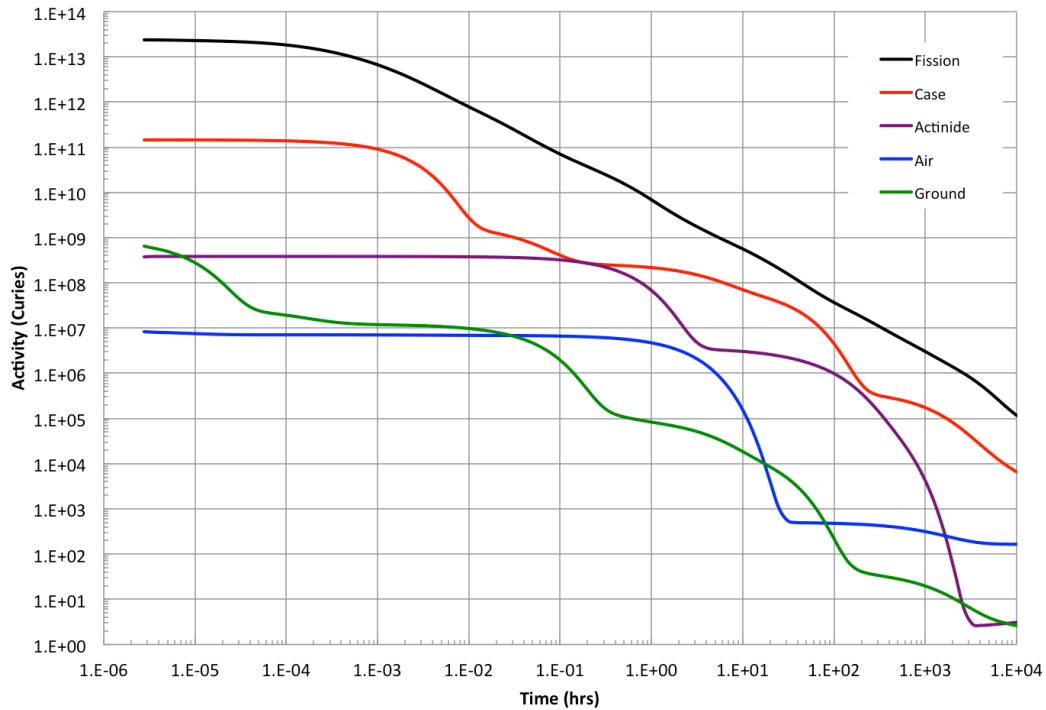


Figure 7. Plot of the residual radiation source term for each of the five major categories. These five curves represent the aggregate decay of ~1200 radionuclides.

The time-dependent, total activity of the radionuclides produced in each residual source term is shown in Figure 7. As can be noted, the fission product source term is, by far, the majority of the total residual radiation source term. The second highest source term is associated with the radionuclides produced in the bomb components. Little Boy was relatively massive with a total weight of ~8,900 pounds (Young, 2005). The third highest source term is associated with the actinides that were produced by non-fission absorptions in the fuel material. Most of these actinides were short-lived, thus resulting in a high initial activity.

Because of the relatively high height-of-burst, a significant fraction of the neutrons produced during the detonation were absorbed in the surrounding air. However, most of the radionuclides that were produced were long-lived. Hence, the initial activity of the air source was relatively low.

Very few neutrons from the detonation actually made it to the ground surface. And, most of the neutrons that made it to the surface were either scattered off of the surface back into the atmosphere where they were absorbed, or they were absorbed in the soil in reactions that did not lead to a radionuclide. Based on the reaction rates predicted by LWAC, only ~23% of the neutrons absorbed in the soil produced a radionuclide.

Figure 7 represents the total activity of ~1200 radionuclides produced during this detonation. The average gamma and beta energy per decay of these radionuclides is shown in Figures 8 and 9.

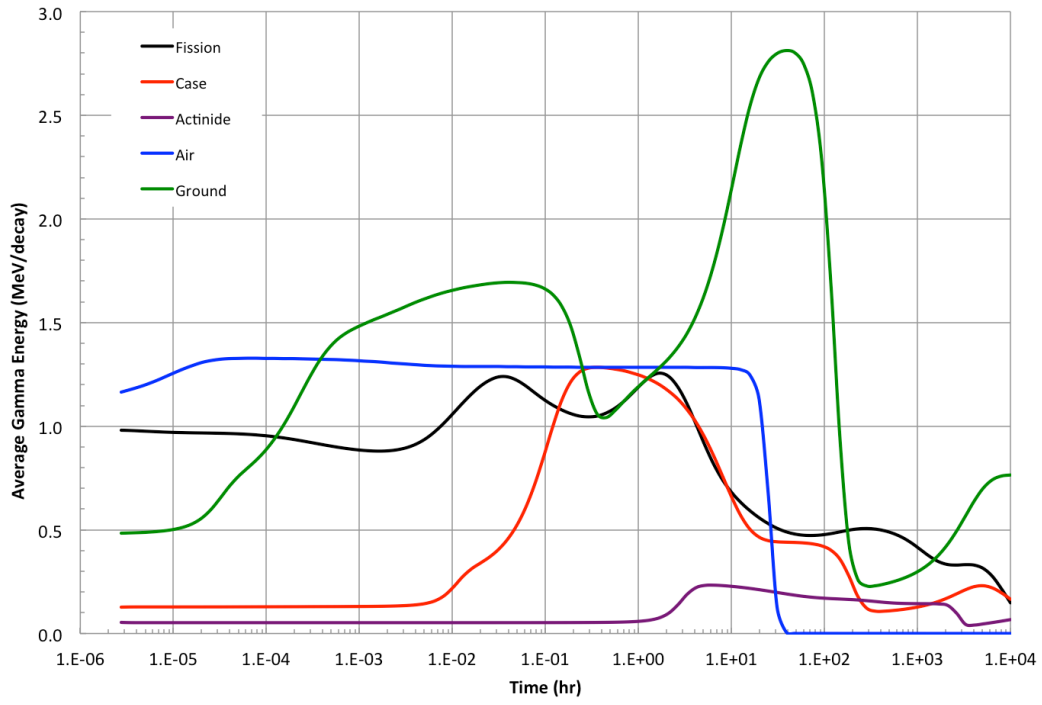


Figure 8. Plot of the average total gamma energy released per decay.

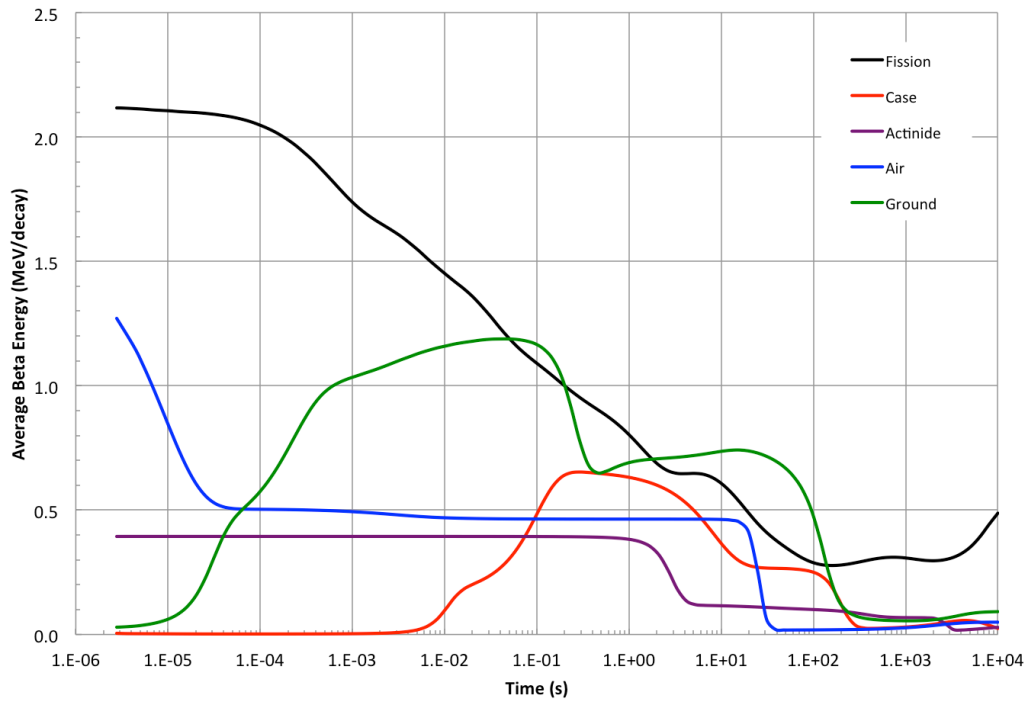


Figure 9. Plot of the average total beta energy released per decay.

Hiroshima Ground Source

Because the SHOB for Hiroshima was ~809 scaled feet, the residual radiation source terms for the fission products, the unburnt fuel, and the neutron-activated bomb components would not have contributed to the local fallout unless there had been a significant amount of rainout. Since the radionuclides produced in the air would have remained in the air (since they, too, are gases), they would not have contributed to the local fallout. The only source term that could have significantly contributed to the local fallout at Hiroshima would have been the *fixed* and the *lofted* activated soil.

When calculating the neutron-activated ground source for the Hiroshima detonation, we assumed the major chemical constituents listed in Table 2 (Santoro, et al.).

Table 2. Major Chemical Constituents of Hiroshima Soil (density = 1.7 gms/cc)

<i>Element</i>	<i>Z Number</i>	<i>Atomic Weight</i>	<i>Weight Fraction</i>
H	1	1.0080	3.04E-02
Li	3	6.9409	2.13E-05
B	5	10.8110	5.17E-06
C	6	12.0110	8.21E-03
N	7	14.0068	1.52E-04
O	8	15.9993	0.5897
Na	11	22.9898	1.22E-02
Mg	12	24.3051	1.93E-03
Al	13	26.9815	5.40E-02
Si	14	28.0855	0.2538
P	15	30.9738	1.28E-04
Cl	17	35.4527	8.74E-05
K	19	39.0983	2.73E-02
Ca	20	40.0780	6.16E-03
Sc	21	44.9559	3.80E-06
Ti	22	47.8784	1.19E-03
V	23	50.9440	1.70E-05
Cr	24	51.9961	1.56E-05
Mn	25	54.9380	3.55E-04
Fe	26	55.8438	1.35E-02
Co	27	58.9332	3.32E-05
Ni	28	58.6879	3.80E-06
Cu	29	63.5456	2.74E-05
Zn	30	65.3982	8.59E-05
Ga	31	69.7230	1.67E-05
As	33	74.9216	3.34E-06
Se	34	78.9773	9.12E-07
Rb	37	85.4679	1.75E-04
Sr	38	87.6167	6.69E-05
Y	39	88.9059	1.52E-05
Zr	40	91.2236	3.12E-05
Nb	41	92.9064	5.32E-06
Mo	42	95.9313	4.56E-07
Ag	47	107.8681	1.52E-07
Sb	51	121.7590	1.06E-06

Cs	55	132.9054	3.80E-06
Ba	56	137.3268	3.96E-04
La	57	138.9055	1.75E-05
Sm	62	150.3602	2.58E-06
Eu	63	151.9642	6.84E-07
Tb	65	158.9254	4.56E-07
Hf	72	178.4864	3.04E-06
Ta	73	180.9479	6.08E-07
Pb	82	207.2169	6.54E-05
Th	90	232.0380	1.01E-05
U	92	238.0289	2.13E-06

Hiroshima Activation Rings

The aggregate decay curves shown in Figure 7 include the *fixed* source and the *lofted* source. In general, the fixed source can produce a relatively high exposure rate in the vicinity of ground zero for many days following the detonation and, depending on the yield and the HOB, can produce an exposure rate that can be detected many years after a detonation. In the case of Hiroshima, the exposure rates associated with the activation rings was relatively high for the first few hours and then decayed to relatively low values thereafter. From a spatial standpoint, the maximum exposure rate is obtained at ground zero (GZ). The time-dependent decay of the exposure rate at GZ is plotted in Figure 10. As can be noted from this plot, the exposure rate immediately following the detonation was ~7128 R/hr. One hour later, the exposure rate had decayed to ~1.7 R/hr.

Figure 10 also shows the integrated exposure at ground zero as a function of time. As can be noted from this figure, the integrated exposure at GZ over the time interval from t=0 to 1000 hours corresponds to ~43 R.

The exposure rate at various distances from ground zero falls off in accordance to the normalized curve shown in Figure 11. By multiplying the values in Figure 10 by the values in Figure 11, the exposure rate at any point in time and at any point in space can be determined. Figures 12 and 13 are the results of this process.

The exposure rates at Hiroshima in the vicinity of ground zero were measured by Tybout (1946) ~60 days after the detonation and by Pace and Smith (1959) ~87 days after the detonation. A plot of the activation rings measured by Pace and Smith is shown in Figure 14. As can be seen from this figure, the rings are not symmetric about ground zero. The cause for this asymmetry is unknown. But, in all likelihood, this asymmetry is due to small changes in the soil chemistry in the vicinity of ground zero. As can be shown by running LWAC, it doesn't take much of a change in the sodium or aluminum content to produce rather large changes in the exposure rate. The soil chemistry that was used in this study was obtained from soil samples that were taken from ground zero after the detonation. As can be shown in Figure 15, the exposures rate calculated by LWAC for the regions close to ground zero are in excellent agreement with the values measured by Pace and Smith. However, at distances that are further away from ground zero, the measured data appears to have reached some sort of background value.

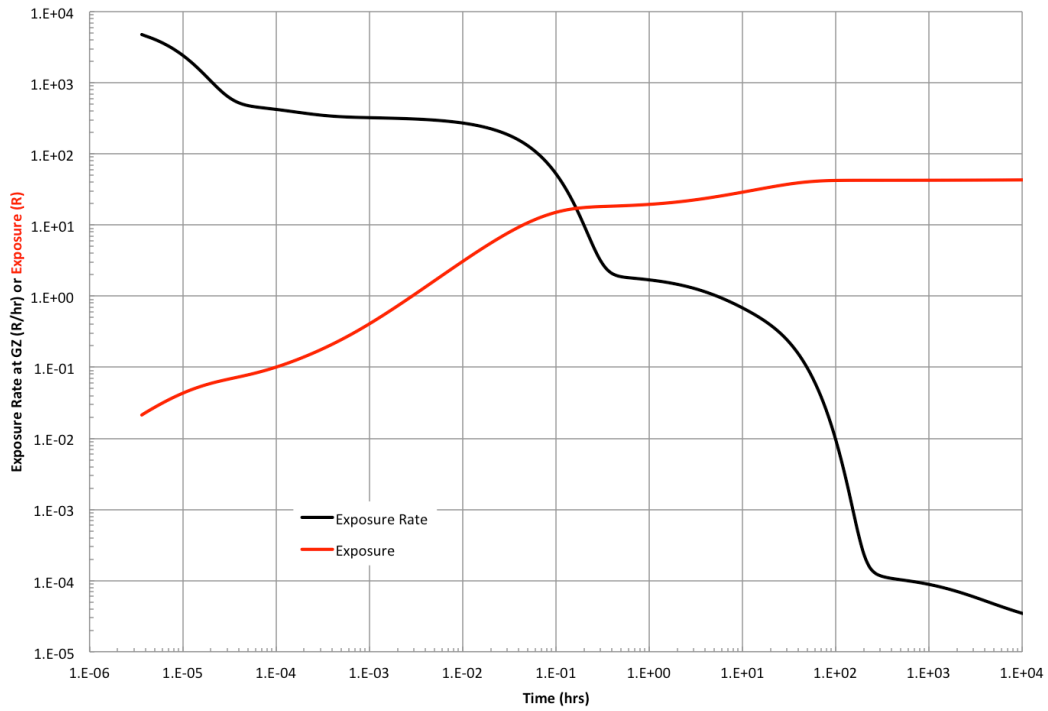


Figure 10. This is a plot of the time-dependent exposure rate and its integral at ground zero produced by the activation rings created from the detonation.

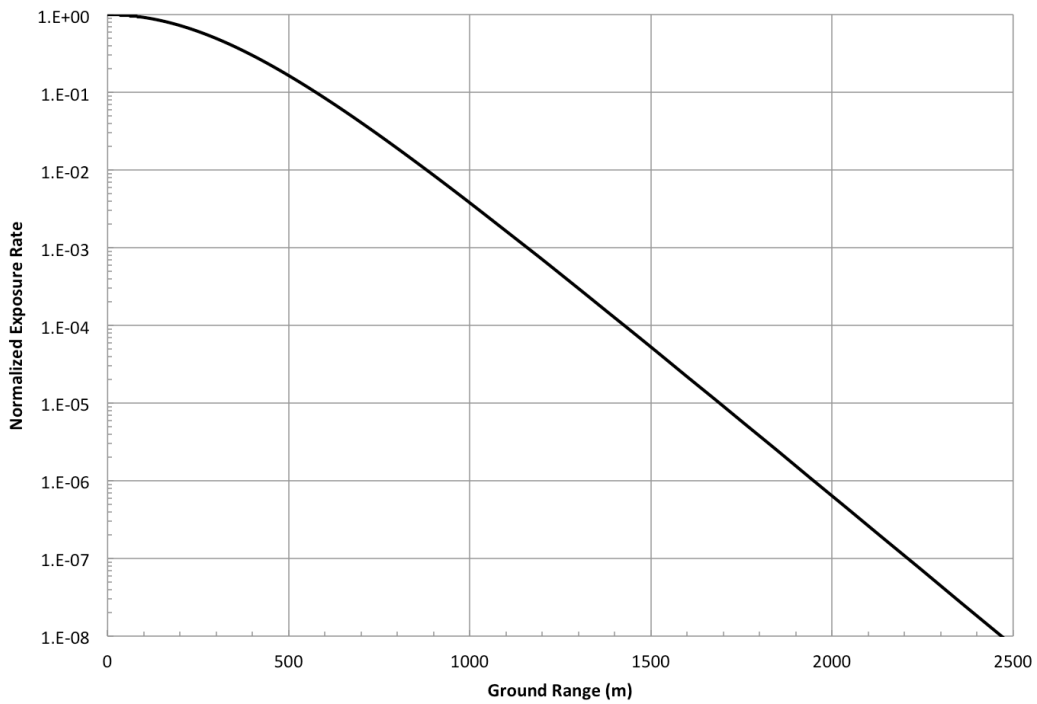


Figure 11. This is a plot of the normalized exposure rate as a function of distance from ground zero.

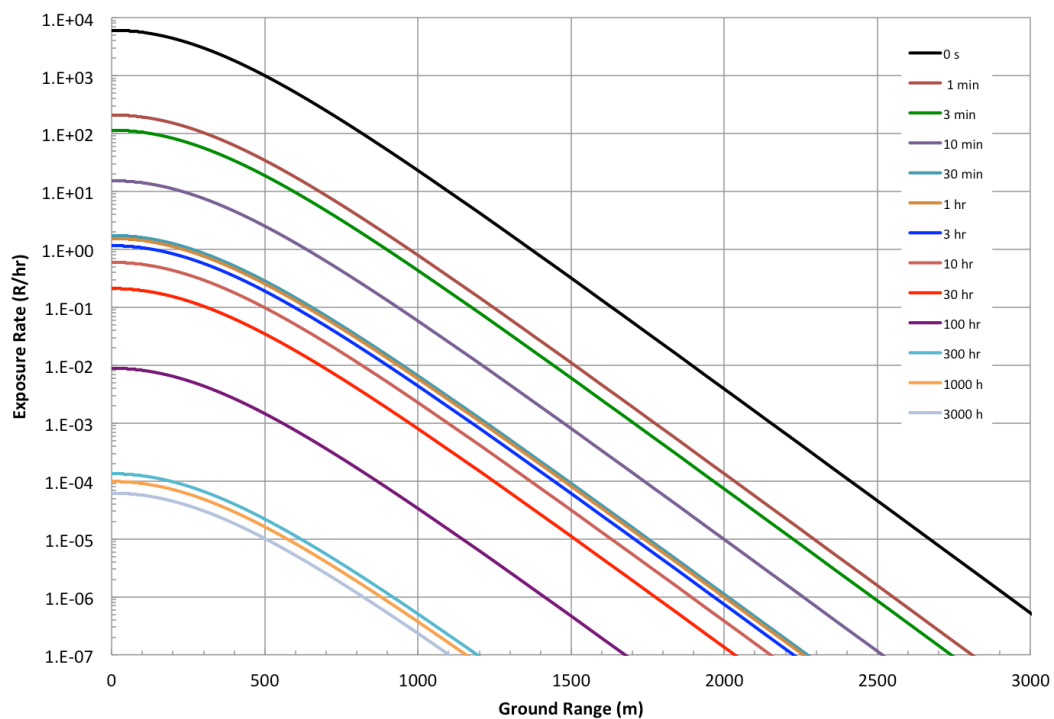


Figure 12. Exposure rate vs. distance vs. time for activation rings.

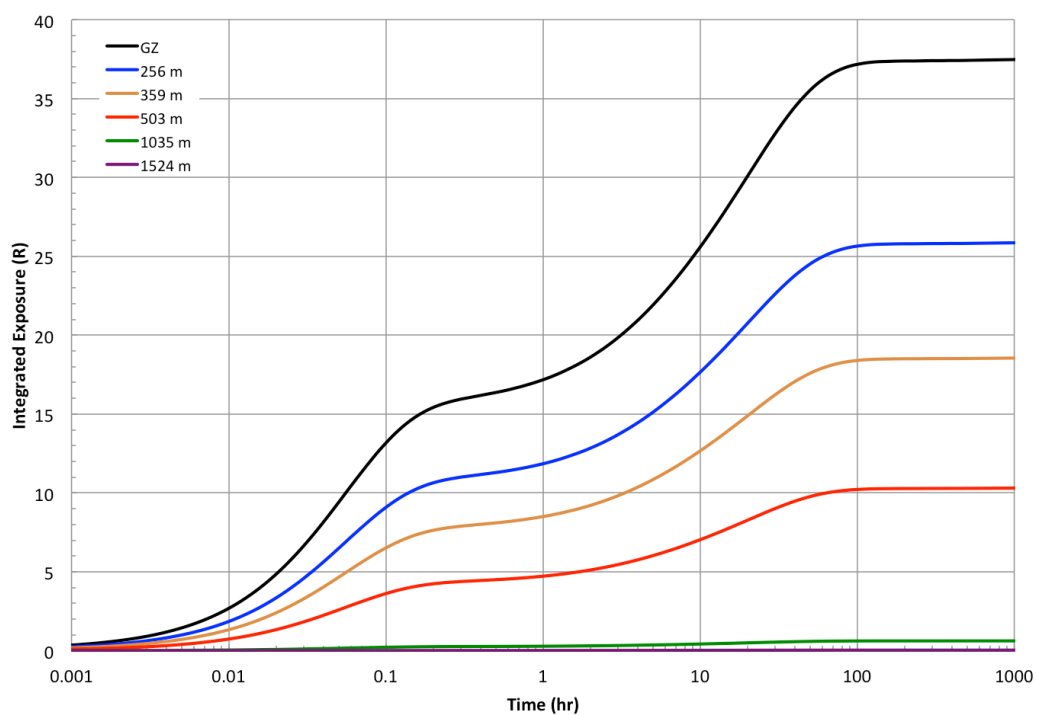


Figure 13. Plot of integrated exposure vs. time vs. distance from ground zero.

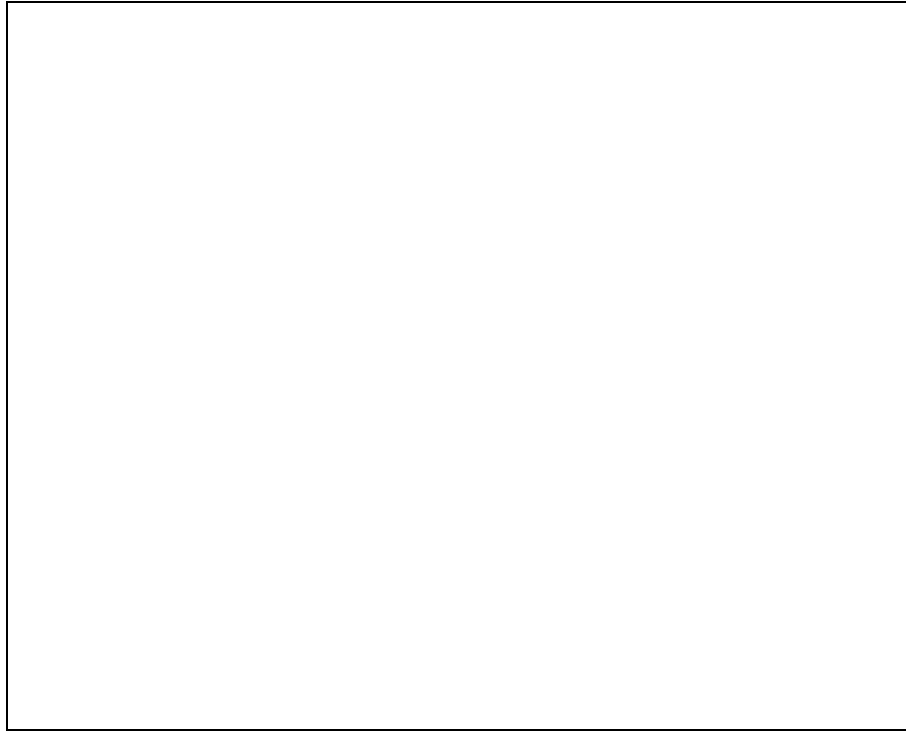


Figure 14. Exposure Rate contour map as measured by Pace and Smith (1959).

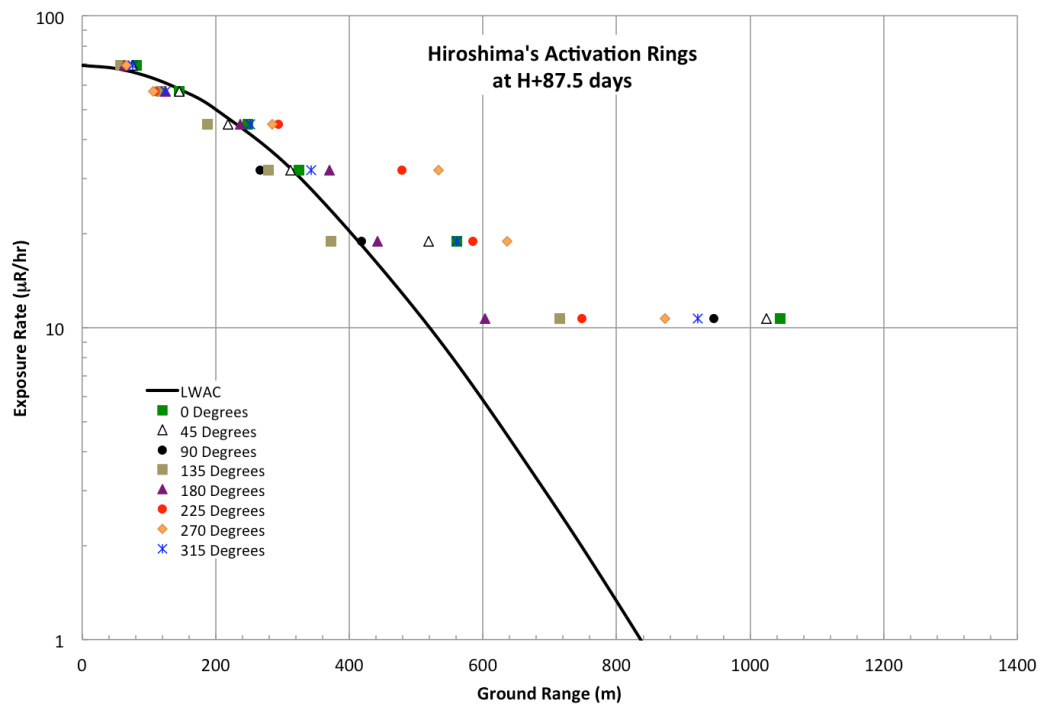


Figure 15. Comparison of measured data of Pace and Smith (1959) with LWAC prediction.

If the data from Tybout (1946), taken at ~60 days after the detonation, and from Pace and Smith (1959), taken at ~87.5 days after the detonation, are extrapolated back to H+1 hour, it can be noted that both sets of data are in general agreement with the LWAC prediction (see Figure 16). The data from Tybout, however, has more scatter to it at distances close to ground zero. And, both sets of data show the unexplained background measured at distances far removed from GZ.

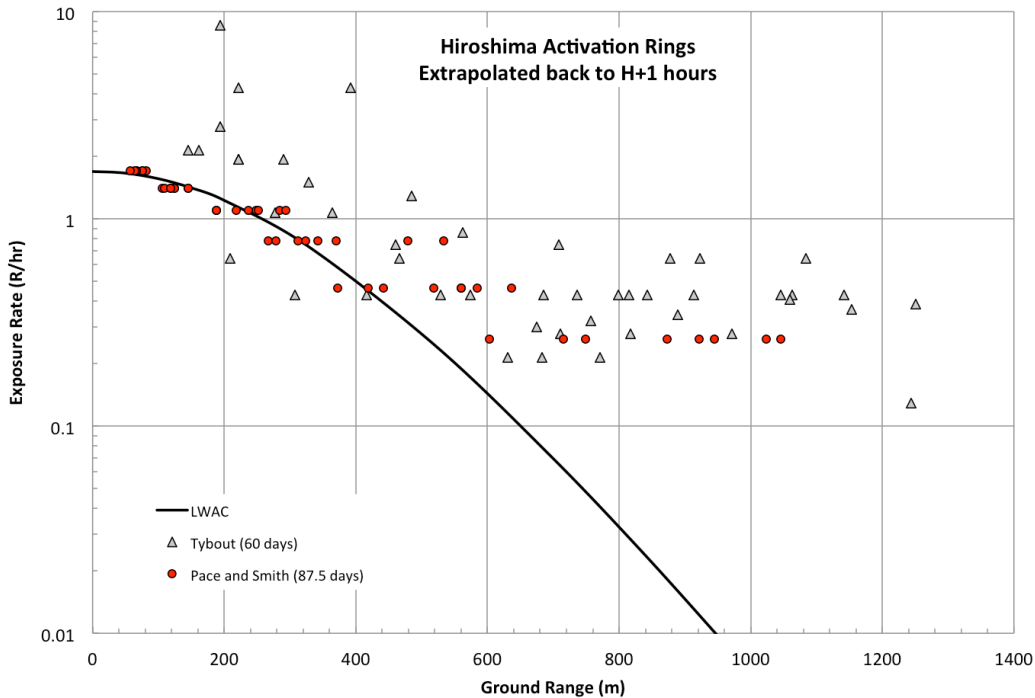


Figure 16. Comparison of LWAC prediction of exposure rates at H+1 hour after detonation with measured values of Tybout (1946) and Pace and Smith (1959) extrapolated back to H+1 using the LWAC calculated decay curve for the ground source.

Hiroshima Lofted Ground Source

Because of the relatively high height-of-burst (HOB), no surface crater was created by the Hiroshima detonation. However, some of the topsoil in the vicinity of GZ was lofted (see Figure 4). Based on experimental data obtained during the atmospheric testing era, it has been estimated that somewhere between 0.1 to 1% of the total residual ground source is lofted from a Regime 2/3 detonation. The exact amount that is lofted is very dependent on the condition of the surface and its moisture content.

Surprisingly, lofting some of the activated soil in the vicinity of ground zero does not significantly alter the magnitude of the activation rings. As seen in Figure 17, the concentration of the radionuclides varies as a function of depth into the soil with a maximum concentration occurring at ~2 cm below the surface. When a thin layer of

topsoil is removed, the gammas emitted by the radionuclides that are located deeper in the soil are more likely to escape from the surface since the amount of attenuating material has been decreased. Hence, the *ground shine* remains essentially unchanged.

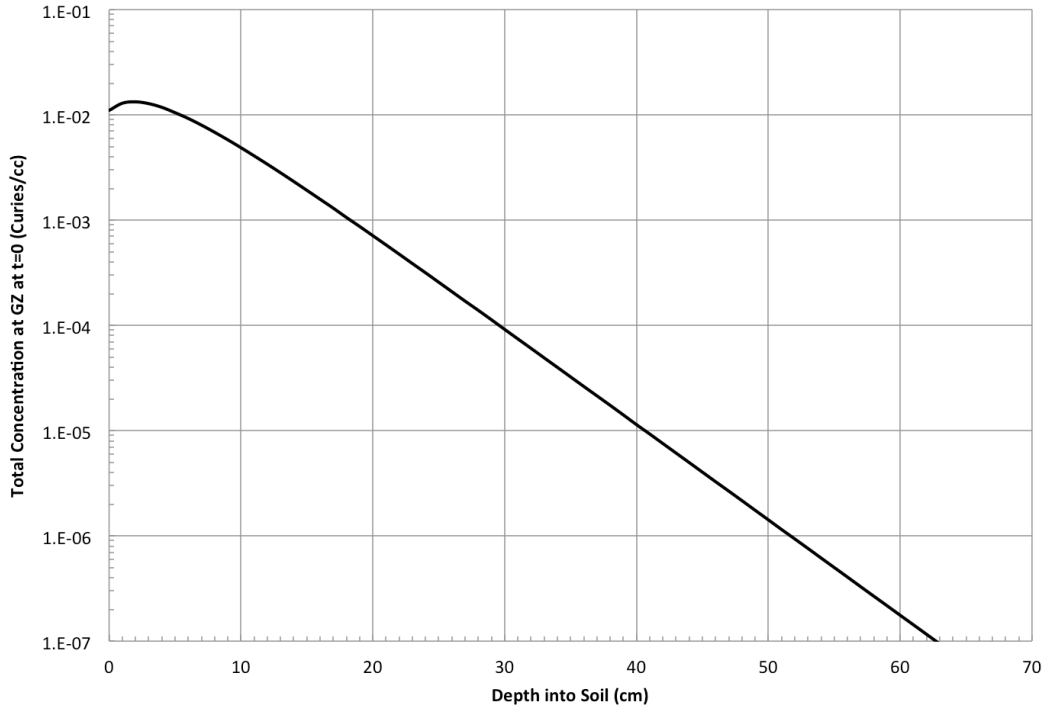


Figure 17. Plot of the total radionuclide concentration in the soil at GZ and $t = 0.0$ as a function of depth into the soil.

The cloud height (i.e., the top of the cap) is also an important parameter that greatly affects the amount of local fallout. The cloud height for Hiroshima has been previously estimated by Imanaka (2008). A new estimate has been made by these authors using a new code (OVERCAST) currently being developed at Lawrence Livermore National Laboratory. This prediction is shown in Figure 18. As can be noted, it took ~ 8 minutes for the Hiroshima cloud to reach its maximum height. As noted in Figure 7, the total ground activation source term at this point in time was $\sim 10^6$ Curies. Assuming that 1% was lofted, the total activity contained in the dirt stem would have been $\sim 10^4$ Curies. Although the heavier particles contained in the dirt stem would have already begun to *fallout* during the cloud rise, once the cloud reached its maximum, all of the particles would have begun to fall. Unfortunately, very little is known about the wind conditions at the time of the detonation. This makes a fallout calculation nearly impossible. However, a scoping calculation can be performed that can potentially bracket the magnitude of the exposure rates that would have been produced from the *dirt stem fallout* (assuming it landed somewhere downwind of the activation rings). In order to perform this calculation, the time-dependent exposure rate conversion factor (ECF) must be known. LWAC performs this calculation based on the total radionuclide inventory at any given point in time for each of the residual radiation source terms. These results are shown in Figure 19.

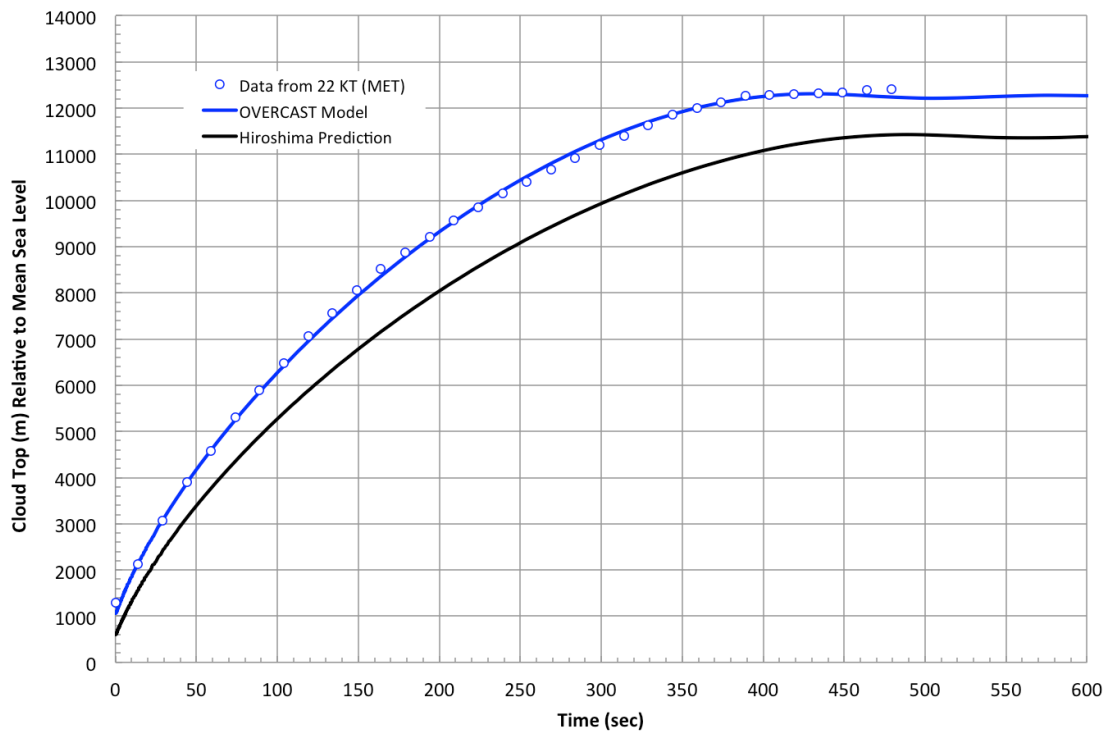


Figure 18. Predicted cloud rise for Hiroshima detonation assuming a standard atmosphere and a 16 KT yield.

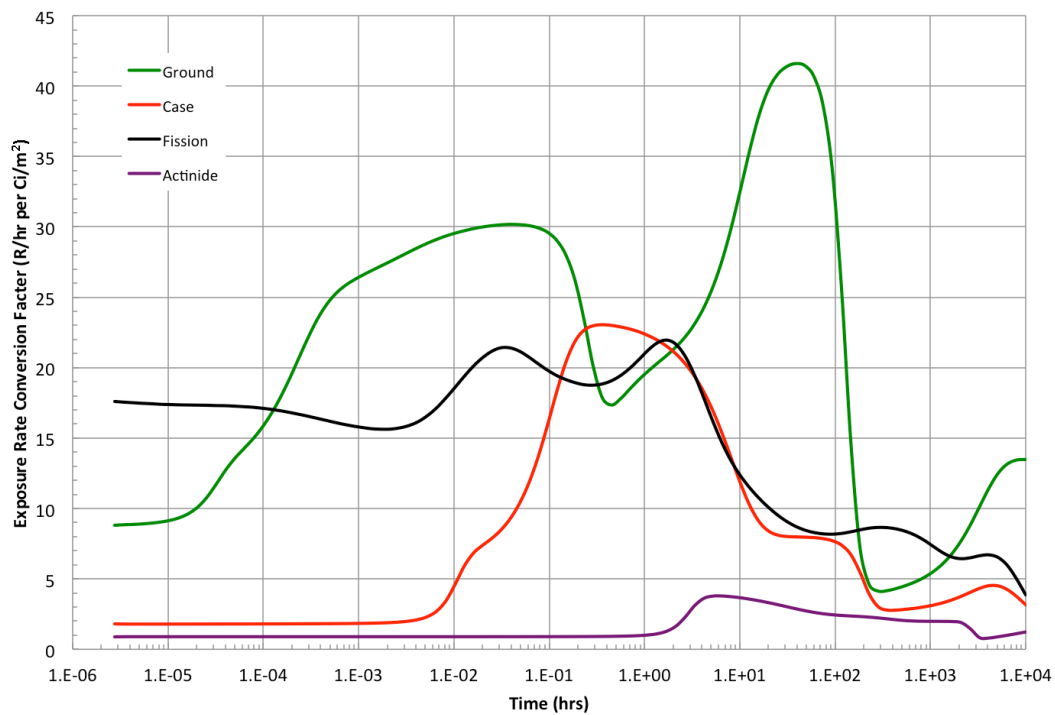


Figure 19. Plot of the time-dependent, exposure rate conversion factors (ECF) for activated soil at Hiroshima.

As can be seen from Figure 20, the exposure rate produced by fallout associated with the lofted ground source (assuming it landed downwind of the activation rings) is relatively small at times greater than about 8 minutes. This figure does not take into account any fallout dust that may have settled directly onto the skin of a Hiroshima survivor. There are many radionuclides contained in the activated ground source term that are strong beta emitters as well as gamma emitters. A list of the ground source radionuclides is contained in Appendix A.

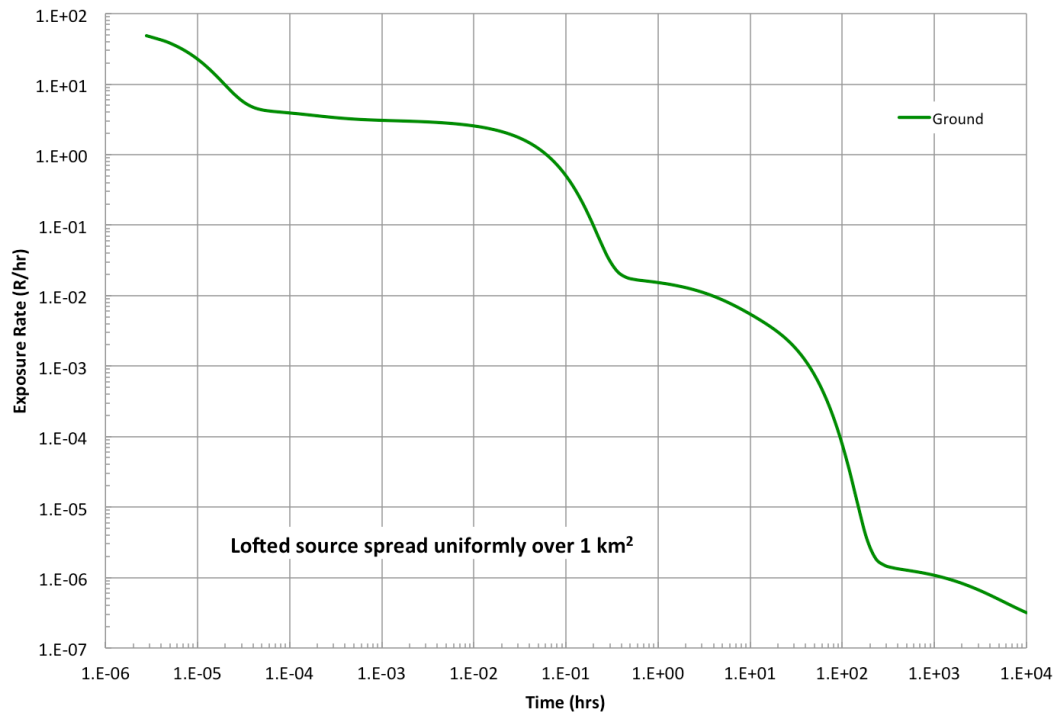


Figure 20. Plot of the time-dependent exposure rate that would be produced 1 meter above the surface if 1% of the total ground activation source term were lofted and then fell back to the surface uniformly over a 1 km² surface area.

Conclusions

The vast majority of the local fallout at Hiroshima was produced by lofted activated soil. Based on test data from the Nevada Test Site, only a small fraction (between 0.1% and 1%) of the total soil activation source would have been lofted for a detonation at a SHOB of 247 scaled meters. When spread uniformly over 1 km² downwind of the activation rings, the exposure rate produced from the activated soil would have been on the order of 0.1 R/hr at ~10 minutes and would have rapidly decreased at greater times. Within 200 hours, the exposure rate decreases by a factor of ~10,000.

The activation rings produced from the Hiroshima detonation generated exposure rates on the order of ~51 R/hr at ground zero at 6 minutes following the detonation. Within 300 hours, the exposure rate at ground zero decreased to ~0.0001 R/hr. Hypothetically, a person who remained standing at GZ from the time of detonation to 1 hr after the detonation would have only received ~20 R from the ground activation source term. If standing at other distances from GZ, the integrated exposure would have dropped off very rapidly as a function of distance from GZ (see Table 3).

Table 3. Integrated Exposure Produced from
Activation Rings vs. Distance from GZ

<i>Distance (m) from GZ</i>	<i>Integrated Exposure (R) over 1 hr period following detonation</i>
0	~20
100	~17
300	~10
500	~3
700	~0.8
1000	~0.07
2000	~9x10 ⁻⁶

From these calculations, it would appear that ground activation (both *fixed* and *lofted*) would not have been a significant contributor to the exposure obtained by survivors at distances greater than 2000 m unless the lofted soil actually landed on their person.

References

- Egbert, Stephen D., George D. Kerr, Harry M. Cullings, *DS02 Fluence Spectra for Neutrons and Gamma Rays at Hiroshima and Nagasaki with Fluence-to-Kerma Coefficients and Transmission Factors for Sample Measurements*, Radiat. Environ. Biophys., June 2007.
- Imanaka, Tetsuji, *Initial Process of Atomic Bomb Cloud Formation and Radioactivity Distribution*, Research Reactor Institute, Japan, 2008.
- N. Pace and R. E. Smith, *Measurement of the Residual Radiation Intensity at the Hiroshima and Nagasaki Atomic Bomb Sites*, Atomic Bomb Casualty Commission (ABCC) Technical Report 26-59, (1959).
- Santoro, Robert T., et al., *Radiation Transport Calculations for Hiroshima and Nagasaki*, Chapter 3.
- Spriggs, Gregory D., Vince Jodoin, James. R. Furlong, *Livermore's Weapon Activation Code, LWAC: (Beta version LWAC39) Quick Start User's Manual*, Lawrence Livermore National Laboratory technical report, UCRL-SM-462471, November 2010.
- Spriggs, Gregory D., *Fallout Regimes*, Lawrence Livermore National Laboratory poster, UCRL-POST-21962, 2004.
- Tybout, Richard A., *Radiation in Hiroshima and Nagasaki*, AEC Report WO-170, April 6, 1940.
- Young, Robert W. and George D. Kerr, Editors, *Reassessment of the Atomic Bomb Radiation Dosimetry for Hiroshima and Nagasaki, Dosimetry System 2002*, Working Group Report, Hiroshima, Japan: Radiation Effects Research Foundation, 2005.

Appendix A. List of Residual Radionuclides

This appendix contains a list of the fifty most-active radionuclides vs. time produced from the Hiroshima detonation. The points in time were chosen to be equally spaced in the logarithmic plane from 1×10^{-6} hours to 1×10^4 hours.

The activities that are presented are integrals over all space. To obtain an estimate of the lofted ground source, multiply the activities by the fraction of the ground source that was lofted (typically, 0.1 to 1% for Regime 2 clouds).

The gamma and beta energies per decay listed in the table represent integrals over the emission spectrum for each radionuclide.

Ground Source

Point in time = 0.00000000 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01 s 0.99	9.3620E+17	8.6824E+08	0.4720	0.0008	0.0000	0.0000
Al-28	2.2420 m 0.13	8.1100E+19	1.1294E+07	1.7790	1.2470	0.0000	0.0000
Ta-182m	0.28300 s 1.06	1.1080E+17	7.3346E+06	0.0017	0.0122	0.0000	0.0000
Ba-136m	0.30840 s 0.62	9.1260E+16	5.5436E+06	1.9230	0.1070	0.0000	0.0000
Cl-38m	0.71500 s 0.42	6.9990E+16	1.8338E+06	0.6710	0.0000	0.0000	0.0000
Hf-179m	18.670 s 0.21	3.2990E+17	3.3103E+05	0.2370	0.0000	0.0000	0.0000
Hf-177m	1.0800 s 5.56	1.7580E+16	3.0494E+05	1.0640	0.2404	0.0000	0.0000
Sc-46m	18.700 s 0.37	1.9390E+17	1.9425E+05	0.0883	0.0523	0.0000	0.0000
Li-8	0.83800 s 0.72	6.8080E+15	1.5219E+05	0.0370	6.2000	0.0000	1.5700
Co-60m	10.470 m 0.38	3.2740E+18	9.7635E+04	0.0066	0.0536	0.0000	0.0000
B-12	0.20200E-01 s 0.10	5.5090E+13	5.1091E+04	0.0950	6.3550	0.0000	0.0000
Si-31	2.6200 h 0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.7610E+19	3.5492E+04	1.6910	0.8309	0.0000	0.0000
V-52	3.7450 m 0.13	2.9380E+17	2.4495E+04	1.4450	1.0680	0.0000	0.0000
Rb-86m	1.0170 m 0.33	5.8500E+16	1.7960E+04	0.5462	0.0099	0.0000	0.0000
Na-24	14.960 h 0.01	4.0170E+19	1.3973E+04	4.1240	0.5546	0.0000	0.0000
Se-77m	17.360 s 0.29	7.3910E+15	7976.	0.0888	0.0000	0.0000	0.0000
K-42	12.360 h 0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000	0.0000
F-20	11.030 s 0.27	3.7190E+15	6316.	1.6340	2.4810	0.0000	0.0000
Th-233	22.300 m 0.45	3.6020E+17	5043.	0.0369	0.4043	0.0000	0.0000
Ag-110	24.560 s 0.45	5.1540E+15	3931.	0.0340	1.1780	0.0000	0.0000
Mg-27	9.4580 m 0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000	0.0000
Cu-66	5.1000 m 0.20	5.9560E+16	3646.	0.0978	1.0670	0.0000	0.0000
U-239	23.470 m 0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000	0.0000
Ti-51	5.8000 m 0.52	3.9890E+16	2147.	0.3692	0.8684	0.0000	0.0000
N-16	7.1300 s 0.28	6.9580E+14	1828.	4.6030	2.6930	0.0000	0.0000
Ga-70	21.130 m 0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000	0.0000
Hf-178m	4.0000 s 7.50	3.0870E+14	1446.	1.0026	0.1430	0.0000	0.0000
O-19	26.910 s 0.30	1.8800E+15	1309.	0.9398	1.7770	0.0000	0.0000
Eu-154m	46.400 m 1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000	0.0000
Ne-23	37.200 s 0.54	2.5060E+15	1262.	0.1653	1.8960	0.0000	0.0000
Nb-94m	6.2600 m 0.16	2.5270E+16	1260.	0.0117	0.0349	0.0000	0.0000
Ca-49	8.7200 m 0.23	3.4340E+16	1230.	3.1700	0.8697	0.0000	0.0000
Pb-207m	0.80600 s 0.74	4.2730E+13	993.2	1.4990	0.0000	0.0000	0.0000
Cs-134m	2.9080 h 0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000	0.0000
Ba-137m	2.5520 m 0.04	7.5780E+15	927.1	0.5990	0.0652	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000	0.0000
Cl-38	37.200 m 0.27	6.9990E+16	587.4	1.5110	1.5200	0.0000	0.0000
Al-30	3.6500 s 1.64	1.1360E+14	583.1	3.4820	2.2990	0.0000	0.0000
Ba-139	1.3840 h 0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000	0.0000
Ag-108	2.4000 m 0.83	2.2780E+15	296.4	0.0195	0.6080	0.0011	0.0000
Al-29	6.5600 m 0.91	6.2090E+15	295.5	1.3790	0.9765	0.0000	0.0000
Sb-124m	1.5500 m 5.38	1.3050E+15	262.9	0.4400	0.1120	0.0000	0.0000
Ge-71m	0.20400E-01 s 0.83	2.2790E+11	209.3	0.1650	0.0000	0.0000	0.0000
C-15	2.4490 s 0.20	2.7230E+13	208.3	3.3580	2.9960	0.0000	0.0000
Rb-88	17.800 m 0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000	0.0000
Sb-122m	4.1900 m 2.15	2.5110E+15	187.1	0.0704	0.0920	0.0000	0.0000
Cu-64	12.700 h 0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490	0.0000
Zn-69	56.400 m 1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000	0.0000
Hf-180m	5.5000 h 1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 470
Total activity (Ci) = 8.95571E+08

Total number of decays = 0.0000
Asympt number of decays = 6.86756E+20
Percent of decays = 0.0000
Average chain length = 1.0247

Average gamma E (MeV) = 0.49403
Average beta E (MeV) = 1.89701E-02
Average alpha E (MeV) = 2.66808E-04

Composite Exposure Rate Conversion Factor = 9.01456547 R/hr per Ci/m2
Composite ECF per FGR table = 0.449296683 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.17539263 Rem/hr per Ci/m2

Ground Source

Point in time = 9.99999978E-03 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	6.6427E+17	6.1605E+08	0.4720	0.0008	0.0000	0.0000
Al-28	2.2420	m	0.13	8.1096E+19	1.1294E+07	1.7790	1.2470	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.0812E+17	7.1571E+06	0.0017	0.0122	0.0000	0.0000
Ba-136m	0.30840	s	0.62	8.9232E+16	5.4204E+06	1.9230	0.1070	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.9315E+16	1.8161E+06	0.6710	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2978E+17	3.3090E+05	0.2370	0.0000	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.7468E+16	3.0299E+05	1.0640	0.2404	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.9383E+17	1.9418E+05	0.0883	0.0523	0.0000	0.0000
Li-8	0.83800	s	0.72	6.7519E+15	1.5094E+05	0.0370	6.2000	0.0000	1.5700
Co-60m	10.470	m	0.38	3.2740E+18	9.7634E+04	0.0066	0.0536	0.0000	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000	0.0000
B-12	0.20200E-01	s	0.10	3.9088E+13	3.6251E+04	0.0950	6.3550	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000	0.0000
V-52	3.7450	m	0.13	2.9379E+17	2.4494E+04	1.4450	1.0680	0.0000	0.0000
Rb-86m	1.0170	m	0.33	5.8493E+16	1.7958E+04	0.5462	0.0099	0.0000	0.0000
Na-24	14.960	h	0.01	4.0441E+19	1.4067E+04	4.1240	0.5546	0.0000	0.0000
Se-77m	17.360	s	0.29	7.3880E+15	7973.	0.0888	0.0000	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000	0.0000
F-20	11.030	s	0.27	3.7167E+15	6313.	1.6340	2.4810	0.0000	0.0000
Th-233	22.300	m	0.45	3.6020E+17	5043.	0.0369	0.4043	0.0000	0.0000
Ag-110	24.560	s	0.45	5.1525E+15	3930.	0.0340	1.1780	0.0000	0.0000
Mg-27	9.4580	m	0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000	0.0000
Cu-66	5.1000	m	0.20	5.9559E+16	3646.	0.0978	1.0670	0.0000	0.0000
U-239	23.470	m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000	0.0000
Ti-51	5.8000	m	0.52	3.9889E+16	2147.	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	6.9512E+14	1826.	4.6030	2.6930	0.0000	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000	0.0000
Hf-178m	4.0000	s	7.50	3.0817E+14	1443.	1.0026	0.1430	0.0000	0.0000
O-19	26.910	s	0.30	1.8795E+15	1308.	0.9398	1.7770	0.0000	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5055E+15	1262.	0.1653	1.8960	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5270E+16	1260.	0.0117	0.0349	0.0000	0.0000
Ca-49	8.7200	m	0.23	3.4340E+16	1230.	3.1700	0.8697	0.0000	0.0000
Pb-207m	0.80600	s	0.74	4.2364E+13	984.7	1.4990	0.0000	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000	0.0000
Ba-137m	2.5520	m	0.04	7.5777E+15	927.1	0.5990	0.0652	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000	0.0000
Cl-38	37.200	m	0.27	7.0665E+16	593.1	1.5110	1.5200	0.0000	0.0000
Al-30	3.6500	s	1.64	1.1338E+14	581.9	3.4820	2.2990	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	2.1069E-03	563.9	0.0000	0.0000	0.0000	0.0460
Ba-139	1.3840	h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000	0.0000
Ag-108	2.4000	m	0.83	2.2779E+15	296.3	0.0195	0.6080	0.0011	0.0000
Al-29	6.5600	m	0.91	6.2089E+15	295.5	1.3790	0.9765	0.0000	0.0000
Sb-124m	1.5500	m	5.38	1.3049E+15	262.9	0.4400	0.1120	0.0000	0.0000
C-15	2.4490	s	0.20	2.7153E+13	207.7	3.3580	2.9960	0.0000	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000	0.0000
Sb-122m	4.1900	m	2.15	2.5109E+15	187.1	0.0704	0.0920	0.0000	0.0000
Ge-71m	0.20400E-01	s	0.83	1.6225E+11	149.0	0.1650	0.0000	0.0000	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490	0.0000
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155338D+20

Total number of nuclides = 653
Total activity (Ci) = 6.43042E+08

Total number of decays = 2.81980E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 4.10598E-02
Average chain length = 1.0247

Average gamma E (MeV) = 0.50254
Average beta E (MeV) = 2.59098E-02
Average alpha E (MeV) = 3.68565E-04

Composite Exposure Rate Conversion Factor = 9.16269112 R/hr per Ci/m2
Composite ECF per FGR table = 0.624325812 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.28170919 Rem/hr per Ci/m2

Ground Source

Point in time = 1.55975576E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	5.4818E+17	5.0839E+08	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1093E+19	1.1293E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	1.0665E+17	7.0597E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	8.8116E+16	5.3526E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.8940E+16	1.8063E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2971E+17	3.3083E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.7405E+16	3.0191E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9379E+17	1.9414E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.7207E+15	1.5024E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2739E+18	9.7633E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
B-12	0.20200E-01	s	0.10	3.2257E+13	2.9916E+04	0.0950	6.3550	0.0000
V-52	3.7450	m	0.13	2.9379E+17	2.4494E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8490E+16	1.7957E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.0556E+19	1.4107E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3864E+15	7971.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.7154E+15	6310.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6020E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1517E+15	3930.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9558E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9889E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.9475E+14	1825.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0787E+14	1442.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8792E+15	1308.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5053E+15	1262.	0.1653	1.8960	0.0000
Nb-94m	6.2600	m	0.16	2.5269E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4339E+16	1230.	3.1700	0.8697	0.0000
Pb-207m	0.80600	s	0.74	4.2161E+13	979.9	1.4990	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5775E+15	927.1	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Cl-38	37.200	m	0.27	7.1040E+16	596.3	1.5110	1.5200	0.0000
Al-30	3.6500	s	1.64	1.1326E+14	581.3	3.4820	2.2990	0.0000
Be-8	0.70000E-16	s	28.57	1.7387E-03	465.3	0.0000	0.0000	0.0460
Ba-139	1.3840	h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2778E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2088E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3048E+15	262.8	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.7110E+13	207.4	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5109E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0000
Ge-71m	0.20400E-01	s	0.83	1.3415E+11	123.2	0.1650	0.0000	0.0000
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155363D+20

Total number of nuclides = 656
Total activity (Ci) = 5.35201E+08

Total number of decays = 4.03636E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 5.87744E-02
Average chain length = 1.0247

Average gamma E (MeV) = 0.50859
Average beta E (MeV) = 3.08634E-02
Average alpha E (MeV) = 4.40777E-04

Composite Exposure Rate Conversion Factor = 9.26815510 R/hr per Ci/m2
Composite ECF per FGR table = 0.749190629 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.35738945 Rem/hr per Ci/m2

Ground Source

Point in time = 1.94798186E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	4.7981E+17	4.4498E+08	0.4720	0.0008	0.0000	0.0000
Al-28	2.2420	m	0.13	8.1092E+19	1.1293E+07	1.7790	1.2470	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.0564E+17	6.9929E+06	0.0017	0.0122	0.0000	0.0000
Ba-136m	0.30840	s	0.62	8.7351E+16	5.3061E+06	1.9230	0.1070	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.8681E+16	1.7995E+06	0.6710	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2966E+17	3.3079E+05	0.2370	0.0000	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.7362E+16	3.0115E+05	1.0640	0.2404	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.9376E+17	1.9411E+05	0.0883	0.0523	0.0000	0.0000
Li-8	0.83800	s	0.72	6.6992E+15	1.4976E+05	0.0370	6.2000	0.0000	1.5700
Co-60m	10.470	m	0.38	3.2739E+18	9.7633E+04	0.0066	0.0536	0.0000	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000	0.0000
B-12	0.20200E-01	s	0.10	2.8234E+13	2.6185E+04	0.0950	6.3550	0.0000	0.0000
V-52	3.7450	m	0.13	2.9378E+17	2.4493E+04	1.4450	1.0680	0.0000	0.0000
Rb-86m	1.0170	m	0.33	5.8487E+16	1.7956E+04	0.5462	0.0099	0.0000	0.0000
Na-24	14.960	h	0.01	4.0624E+19	1.4131E+04	4.1240	0.5546	0.0000	0.0000
Se-77m	17.360	s	0.29	7.3853E+15	7970.	0.0888	0.0000	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000	0.0000
F-20	11.030	s	0.27	3.7145E+15	6309.	1.6340	2.4810	0.0000	0.0000
Th-233	22.300	m	0.45	3.6020E+17	5043.	0.0369	0.4043	0.0000	0.0000
Ag-110	24.560	s	0.45	5.1512E+15	3929.	0.0340	1.1780	0.0000	0.0000
Mg-27	9.4580	m	0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000	0.0000
Cu-66	5.1000	m	0.20	5.9557E+16	3646.	0.0978	1.0670	0.0000	0.0000
U-239	23.470	m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000	0.0000
Ti-51	5.8000	m	0.52	3.9888E+16	2147.	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	6.9448E+14	1825.	4.6030	2.6930	0.0000	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000	0.0000
Hf-178m	4.0000	s	7.50	3.0766E+14	1441.	1.0026	0.1430	0.0000	0.0000
O-19	26.910	s	0.30	1.8791E+15	1308.	0.9398	1.7770	0.0000	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5051E+15	1262.	0.1653	1.8960	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5269E+16	1260.	0.0117	0.0349	0.0000	0.0000
Ca-49	8.7200	m	0.23	3.4339E+16	1230.	3.1700	0.8697	0.0000	0.0000
Pb-207m	0.80600	s	0.74	4.2020E+13	976.7	1.4990	0.0000	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000	0.0000
Ba-137m	2.5520	m	0.04	7.5773E+15	927.1	0.5990	0.0652	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000	0.0000
Cl-38	37.200	m	0.27	7.1299E+16	598.4	1.5110	1.5200	0.0000	0.0000
Al-30	3.6500	s	1.64	1.1318E+14	580.9	3.4820	2.2990	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	1.5218E-03	407.3	0.0000	0.0000	0.0000	0.0460
Ba-139	1.3840	h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000	0.0000
Ag-108	2.4000	m	0.83	2.2778E+15	296.3	0.0195	0.6080	0.0011	0.0000
Al-29	6.5600	m	0.91	6.2088E+15	295.5	1.3790	0.9765	0.0000	0.0000
Sb-124m	1.5500	m	5.38	1.3048E+15	262.8	0.4400	0.1120	0.0000	0.0000
C-15	2.4490	s	0.20	2.7080E+13	207.2	3.3580	2.9960	0.0000	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000	0.0000
Sb-122m	4.1900	m	2.15	2.5109E+15	187.1	0.0704	0.0920	0.0000	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490	0.0000
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000	0.0000
Ge-71m	0.20400E-01	s	0.83	1.1757E+11	108.0	0.1650	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 656
Total activity (Ci) = 4.71666E+08

Total number of decays = 4.75850E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 6.92896E-02
Average chain length = 1.0247

Average gamma E (MeV) = 0.51344
Average beta E (MeV) = 3.48393E-02
Average alpha E (MeV) = 4.98541E-04

Composite Exposure Rate Conversion Factor = 9.35267925 R/hr per Ci/m2
Composite ECF per FGR table = 0.849379003 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.41803598 Rem/hr per Ci/m2

Ground Source

Point in time = 2.43283808E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01 s	0.99	4.0627E+17	3.7678E+08	0.4720	0.0008	0.0000
Al-28	2.2420 m	0.13	8.1090E+19	1.1293E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300 s	1.06	1.0439E+17	6.9103E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840 s	0.62	8.6404E+16	5.2486E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500 s	0.42	6.8359E+16	1.7911E+06	0.6710	0.0000	0.0000
Hf-179m	18.670 s	0.21	3.2960E+17	3.3073E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800 s	5.56	1.7308E+16	3.0022E+05	1.0640	0.2404	0.0000
Sc-46m	18.700 s	0.37	1.9373E+17	1.9407E+05	0.0883	0.0523	0.0000
Li-8	0.83800 s	0.72	6.6724E+15	1.4916E+05	0.0370	6.2000	1.5700
Co-60m	10.470 m	0.38	3.2739E+18	9.7632E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.9378E+17	2.4493E+04	1.4450	1.0680	0.0000
B-12	0.20200E-01 s	0.10	2.3907E+13	2.2171E+04	0.0950	6.3550	0.0000
Rb-86m	1.0170 m	0.33	5.8484E+16	1.7955E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.0697E+19	1.4156E+04	4.1240	0.5546	0.0000
Se-77m	17.360 s	0.29	7.3838E+15	7968.	0.0888	0.0000	0.0000
K-42	12.360 h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030 s	0.27	3.7133E+15	6307.	1.6340	2.4810	0.0000
Th-233	22.300 m	0.45	3.6020E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560 s	0.45	5.1505E+15	3929.	0.0340	1.1780	0.0000
Mg-27	9.4580 m	0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.9557E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9888E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300 s	0.28	6.9416E+14	1824.	4.6030	2.6930	0.0000
Ga-70	21.130 m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000 s	7.50	3.0740E+14	1440.	1.0026	0.1430	0.0000
O-19	26.910 s	0.30	1.8788E+15	1308.	0.9398	1.7770	0.0000
Eu-154m	46.400 m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200 s	0.54	2.5049E+15	1261.	0.1653	1.8960	0.0000
Nb-94m	6.2600 m	0.16	2.5269E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.4339E+16	1230.	3.1700	0.8697	0.0000
Pb-207m	0.80600 s	0.74	4.1845E+13	972.6	1.4990	0.0000	0.0000
Cs-134m	2.9080 h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.5772E+15	927.0	0.5990	0.0652	0.0000
Eu-152m	9.2750 h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Cl-38	37.200 m	0.27	7.1621E+16	601.1	1.5110	1.5200	0.0000
Al-30	3.6500 s	1.64	1.1308E+14	580.4	3.4820	2.2990	0.0000
Ba-139	1.3840 h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000
Be-8	0.70000E-16 s	28.57	1.2886E-03	344.9	0.0000	0.0000	0.0460
Ag-108	2.4000 m	0.83	2.2777E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600 m	0.91	6.2087E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500 m	5.38	1.3048E+15	262.8	0.4400	0.1120	0.0000
C-15	2.4490 s	0.20	2.7043E+13	206.9	3.3580	2.9960	0.0000
Rb-88	17.800 m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.5108E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Ge-71m	0.20400E-01 s	0.83	9.9712E+10	91.57	0.1650	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 654
Total activity (Ci) = 4.03309E+08

Total number of decays = 5.54165E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 8.06931E-02
Average chain length = 1.0247

Average gamma E (MeV) = 0.52035
Average beta E (MeV) = 4.05123E-02
Average alpha E (MeV) = 5.80699E-04

Composite Exposure Rate Conversion Factor = 9.47309875 R/hr per Ci/m2
Composite ECF per FGR table = 0.992286026 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.50443602 Rem/hr per Ci/m2

Ground Source

Point in time = 3.03837620E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	3.3005E+17	3.0609E+08	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1087E+19	1.1292E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	1.0285E+17	6.8086E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	8.5236E+16	5.1776E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.7959E+16	1.7806E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2953E+17	3.3065E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.7241E+16	2.9905E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9368E+17	1.9403E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.6390E+15	1.4842E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2739E+18	9.7631E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9377E+17	2.4492E+04	1.4450	1.0680	0.0000
B-12	0.20200E-01	s	0.10	1.9421E+13	1.8012E+04	0.0950	6.3550	0.0000
Rb-86m	1.0170	m	0.33	5.8480E+16	1.7954E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.0773E+19	1.4183E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3820E+15	7966.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.7119E+15	6304.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6019E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1496E+15	3928.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1360E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9556E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9888E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.9375E+14	1823.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0708E+14	1438.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8785E+15	1308.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5046E+15	1261.	0.1653	1.8960	0.0000
Nb-94m	6.2600	m	0.16	2.5269E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4339E+16	1230.	3.1700	0.8697	0.0000
Pb-207m	0.80600	s	0.74	4.1628E+13	967.6	1.4990	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5770E+15	927.0	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Cl-38	37.200	m	0.27	7.2021E+16	604.5	1.5110	1.5200	0.0000
Al-30	3.6500	s	1.64	1.1295E+14	579.7	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2777E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2087E+15	295.5	1.3790	0.9765	0.0000
Be-8	0.70000E-16	s	28.57	1.0468E-03	280.2	0.0000	0.0000	0.0460
Sb-124m	1.5500	m	5.38	1.3047E+15	262.8	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6997E+13	206.5	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5108E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155342D+20

Total number of nuclides = 656
Total activity (Ci) = 3.32428E+08

Total number of decays = 6.36311E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 9.26547E-02
Average chain length = 1.0247

Average gamma E (MeV) = 0.53050
Average beta E (MeV) = 4.88517E-02
Average alpha E (MeV) = 7.00989E-04

Composite Exposure Rate Conversion Factor = 9.64980984 R/hr per Ci/m2
Composite ECF per FGR table = 1.20228171 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.63120031 Rem/hr per Ci/m2

Ground Source

Point in time = 3.79463360E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01 s	0.99	2.5461E+17	2.3613E+08	0.4720	0.0008	0.0000
Al-28	2.2420 m	0.13	8.1084E+19	1.1292E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300 s	1.06	1.0097E+17	6.6836E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840 s	0.62	8.3799E+16	5.0904E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500 s	0.42	6.7462E+16	1.7676E+06	0.6710	0.0000	0.0000
Hf-179m	18.670 s	0.21	3.2944E+17	3.3056E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800 s	5.56	1.7157E+16	2.9761E+05	1.0640	0.2404	0.0000
Sc-46m	18.700 s	0.37	1.9363E+17	1.9398E+05	0.0883	0.0523	0.0000
Li-8	0.83800 s	0.72	6.5976E+15	1.4749E+05	0.0370	6.2000	1.5700
Co-60m	10.470 m	0.38	3.2739E+18	9.7631E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.9377E+17	2.4492E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.8475E+16	1.7952E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.0848E+19	1.4209E+04	4.1240	0.5546	0.0000
B-12	0.20200E-01 s	0.10	1.4982E+13	1.3895E+04	0.0950	6.3550	0.0000
Se-77m	17.360 s	0.29	7.3798E+15	7964.	0.0888	0.0000	0.0000
K-42	12.360 h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030 s	0.27	3.7101E+15	6301.	1.6340	2.4810	0.0000
Th-233	22.300 m	0.45	3.6019E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560 s	0.45	5.1485E+15	3927.	0.0340	1.1780	0.0000
Mg-27	9.4580 m	0.13	1.1359E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.9555E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9887E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300 s	0.28	6.9324E+14	1821.	4.6030	2.6930	0.0000
Ga-70	21.130 m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000 s	7.50	3.0668E+14	1436.	1.0026	0.1430	0.0000
O-19	26.910 s	0.30	1.8782E+15	1308.	0.9398	1.7770	0.0000
Eu-154m	46.400 m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200 s	0.54	2.5042E+15	1261.	0.1653	1.8960	0.0000
Nb-94m	6.2600 m	0.16	2.5268E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.4338E+16	1230.	3.1700	0.8697	0.0000
Pb-207m	0.80600 s	0.74	4.1358E+13	961.3	1.4990	0.0000	0.0000
Cs-134m	2.9080 h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.5767E+15	927.0	0.5990	0.0652	0.0000
Eu-152m	9.2750 h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Cl-38	37.200 m	0.27	7.2517E+16	608.7	1.5110	1.5200	0.0000
Al-30	3.6500 s	1.64	1.1278E+14	578.9	3.4820	2.2990	0.0000
Ba-139	1.3840 h	0.34	9.1830E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000 m	0.83	2.2776E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600 m	0.91	6.2086E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500 m	5.38	1.3046E+15	262.8	0.4400	0.1120	0.0000
Be-8	0.70000E-16 s	28.57	8.0756E-04	216.1	0.0000	0.0000	0.0460
C-15	2.4490 s	0.20	2.6939E+13	206.1	3.3580	2.9960	0.0000
Rb-88	17.800 m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.5107E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155355D+20

Total number of nuclides = 657
Total activity (Ci) = 2.62234E+08

Total number of decays = 7.19086E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 0.10471
Average chain length = 1.0247

Average gamma E (MeV) = 0.54589
Average beta E (MeV) = 6.15403E-02
Average alpha E (MeV) = 8.83074E-04

Composite Exposure Rate Conversion Factor = 9.91806412 R/hr per Ci/m2
Composite ECF per FGR table = 1.52163756 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.82359934 Rem/hr per Ci/m2

Ground Source

Point in time = 4.73912507E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	1.8413E+17	1.7076E+08	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1080E+19	1.1292E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	9.8657E+16	6.5308E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	8.2039E+16	4.9835E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.6847E+16	1.7515E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2932E+17	3.3044E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.7053E+16	2.9581E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9356E+17	1.9391E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.5463E+15	1.4634E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2738E+18	9.7630E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9376E+17	2.4491E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8469E+16	1.7950E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.0918E+19	1.4233E+04	4.1240	0.5546	0.0000
B-12	0.20200E-01	s	0.10	1.0835E+13	1.0048E+04	0.0950	6.3550	0.0000
Se-77m	17.360	s	0.29	7.3770E+15	7961.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.7079E+15	6298.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6019E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1471E+15	3926.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1359E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9554E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0410E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9886E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.9260E+14	1820.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0618E+14	1434.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8777E+15	1307.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5038E+15	1261.	0.1653	1.8960	0.0000
Nb-94m	6.2600	m	0.16	2.5268E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4338E+16	1230.	3.1700	0.8697	0.0000
Pb-207m	0.80600	s	0.74	4.1024E+13	953.5	1.4990	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5764E+15	926.9	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	7.3132E+16	613.8	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.1258E+14	577.8	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1829E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2775E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2085E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3045E+15	262.8	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6867E+13	205.5	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.8	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5107E+15	187.1	0.0704	0.0920	0.0000
Be-8	0.70000E-16	s	28.57	5.8401E-04	156.3	0.0000	0.0000	0.0460
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 660
Total activity (Ci) = 1.96586E+08

Total number of decays = 7.98640E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 0.11629
Average chain length = 1.0247

Average gamma E (MeV) = 0.57012
Average beta E (MeV) = 8.15811E-02
Average alpha E (MeV) = 1.16879E-03

Composite Exposure Rate Conversion Factor = 10.3405333 R/hr per Ci/m2
Composite ECF per FGR table = 2.02573657 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.12654829 Rem/hr per Ci/m2

Ground Source

Point in time = 5.91870211E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	1.2284E+17	1.1392E+08	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1075E+19	1.1291E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	9.5848E+16	6.3448E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	7.9893E+16	4.8531E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.6087E+16	1.7315E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2918E+17	3.3030E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.6925E+16	2.9358E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9348E+17	1.9382E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.4827E+15	1.4492E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2738E+18	9.7628E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9375E+17	2.4490E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8461E+16	1.7948E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.0979E+19	1.4255E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3736E+15	7957.	0.0888	0.0000	0.0000
B-12	0.20200E-01	s	0.10	7.2284E+12	6704.	0.0950	6.3550	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.7052E+15	6293.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6019E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1454E+15	3925.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1359E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9552E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0409E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9885E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.9181E+14	1818.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0555E+14	1431.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8771E+15	1307.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200	s	0.54	2.5032E+15	1261.	0.1653	1.8960	0.0000
Nb-94m	6.2600	m	0.16	2.5267E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4337E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Pb-207m	0.80600	s	0.74	4.0609E+13	943.9	1.4990	0.0000	0.0000
Ba-137m	2.5520	m	0.04	7.5760E+15	926.9	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	7.3892E+16	620.2	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.1233E+14	576.5	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1829E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2774E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2084E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3044E+15	262.8	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6778E+13	204.8	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1160E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5106E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Be-8	0.70000E-16	s	28.57	3.8961E-04	104.3	0.0000	0.0000	0.0460
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 654
Total activity (Ci) = 1.39401E+08

Total number of decays = 8.71125E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 0.12685
Average chain length = 1.0247

Average gamma E (MeV) = 0.60962
Average beta E (MeV) = 0.11437
Average alpha E (MeV) = 1.63223E-03

Composite Exposure Rate Conversion Factor = 11.0291338 R/hr per Ci/m2
Composite ECF per FGR table = 2.84979010 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.62020969 Rem/hr per Ci/m2

Ground Source

Point in time = 7.39187896E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01 s	0.99	7.4096E+16	6.8718E+07	0.4720	0.0008	0.0000
Al-28	2.2420 m	0.13	8.1069E+19	1.1290E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300 s	1.06	9.2451E+16	6.1200E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840 s	0.62	7.7291E+16	4.6950E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500 s	0.42	6.5150E+16	1.7070E+06	0.6710	0.0000	0.0000
Hf-179m	18.670 s	0.21	3.2900E+17	3.3012E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800 s	5.56	1.6765E+16	2.9081E+05	1.0640	0.2404	0.0000
Sc-46m	18.700 s	0.37	1.9337E+17	1.9372E+05	0.0883	0.0523	0.0000
Li-8	0.83800 s	0.72	6.4042E+15	1.4317E+05	0.0370	6.2000	1.5700
Co-60m	10.470 m	0.38	3.2737E+18	9.7627E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.9373E+17	2.4489E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.8451E+16	1.7945E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1028E+19	1.4271E+04	4.1240	0.5546	0.0000
Se-77m	17.360 s	0.29	7.3692E+15	7952.	0.0888	0.0000	0.0000
K-42	12.360 h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030 s	0.27	3.7018E+15	6287.	1.6340	2.4810	0.0000
Th-233	22.300 m	0.45	3.6019E+17	5043.	0.0369	0.4043	0.0000
B-12	0.20200E-01 s	0.10	4.3601E+12	4044.	0.0950	6.3550	0.0000
Ag-110	24.560 s	0.45	5.1433E+15	3923.	0.0340	1.1780	0.0000
Mg-27	9.4580 m	0.13	1.1359E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.9550E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0409E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9884E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300 s	0.28	6.9082E+14	1815.	4.6030	2.6930	0.0000
Ga-70	21.130 m	0.14	1.0550E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000 s	7.50	3.0477E+14	1427.	1.0026	0.1430	0.0000
O-19	26.910 s	0.30	1.8764E+15	1306.	0.9398	1.7770	0.0000
Eu-154m	46.400 m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Ne-23	37.200 s	0.54	2.5026E+15	1260.	0.1653	1.8960	0.0000
Nb-94m	6.2600 m	0.16	2.5267E+16	1260.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.4337E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080 h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Pb-207m	0.80600 s	0.74	4.0098E+13	932.0	1.4990	0.0000	0.0000
Ba-137m	2.5520 m	0.04	7.5755E+15	926.8	0.5990	0.0652	0.0000
Cl-38	37.200 m	0.27	7.4828E+16	628.1	1.5110	1.5200	0.0000
Eu-152m	9.2750 h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500 s	1.64	1.1202E+14	574.9	3.4820	2.2990	0.0000
Ba-139	1.3840 h	0.34	9.1829E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000 m	0.83	2.2772E+15	296.3	0.0195	0.6080	0.0011
Al-29	6.5600 m	0.91	6.2082E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500 m	5.38	1.3043E+15	262.7	0.4400	0.1120	0.0000
C-15	2.4490 s	0.20	2.6666E+13	204.0	3.3580	2.9960	0.0000
Rb-88	17.800 m	0.56	1.1159E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.5105E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7958E+15	67.15	0.1040	0.5680	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155338D+20

Total number of nuclides = 654
Total activity (Ci) = 9.37806E+07

Total number of decays = 9.33641E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 0.13595
Average chain length = 1.0247

Average gamma E (MeV) = 0.67518
Average beta E (MeV) = 0.16908
Average alpha E (MeV) = 2.39684E-03

Composite Exposure Rate Conversion Factor = 12.1727371 R/hr per Ci/m2
Composite ECF per FGR table = 4.22356176 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 8.43978405 Rem/hr per Ci/m2

Ground Source

Point in time = 9.23173055E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	3.9411E+16	3.6550E+07	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1061E+19	1.1289E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	8.8377E+16	5.8503E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	7.4160E+16	4.5048E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.3998E+16	1.6768E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2877E+17	3.2989E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.6569E+16	2.8740E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9324E+17	1.9359E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.3075E+15	1.4101E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2737E+18	9.7625E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9372E+17	2.4488E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8439E+16	1.7941E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1062E+19	1.4283E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3638E+15	7947.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6975E+15	6280.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6018E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1406E+15	3921.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1359E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9548E+16	3646.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0409E+17	2715.	0.0521	0.3947	0.0000
B-12	0.20200E-01	s	0.10	2.3191E+12	2151.	0.0950	6.3550	0.0000
Ti-51	5.8000	m	0.52	3.9883E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.8958E+14	1812.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0549E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0380E+14	1423.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8755E+15	1306.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9340E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5266E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.5017E+15	1260.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4336E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5748E+15	926.8	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.9469E+13	917.4	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	7.5980E+16	637.7	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.1163E+14	572.9	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1829E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2770E+15	296.2	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2080E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3041E+15	262.7	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6528E+13	202.9	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1159E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5104E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7958E+15	67.15	0.1040	0.5680	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155355D+20

Total number of nuclides = 658
Total activity (Ci) = 6.11138E+07

Total number of decays = 9.85217E+17
Asympt number of decays = 6.86756E+20
Percent of decays = 0.14346
Average chain length = 1.0247

Average gamma E (MeV) = 0.78122
Average beta E (MeV) = 0.25818
Average alpha E (MeV) = 3.62243E-03

Composite Exposure Rate Conversion Factor = 14.0231676 R/hr per Ci/m2
Composite ECF per FGR table = 6.45800114 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 9.76529026 Rem/hr per Ci/m2

Ground Source

Point in time = 0.115295239 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24m	0.20200E-01	s	0.99	1.7914E+16	1.6613E+07	0.4720	0.0008	0.0000
Al-28	2.2420	m	0.13	8.1052E+19	1.1288E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	8.3541E+16	5.5301E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	7.0427E+16	4.2781E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.2588E+16	1.6399E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2849E+17	3.2961E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.6326E+16	2.8319E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9307E+17	1.9342E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.1887E+15	1.3835E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2736E+18	9.7622E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9370E+17	2.4486E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8423E+16	1.7937E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1084E+19	1.4291E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3571E+15	7939.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6922E+15	6271.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6018E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1373E+15	3919.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1358E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9544E+16	3645.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0409E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9881E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.8804E+14	1808.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0549E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0259E+14	1417.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8744E+15	1305.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9339E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5265E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.5006E+15	1259.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4335E+16	1229.	3.1700	0.8697	0.0000
B-12	0.20200E-01	s	0.10	1.0541E+12	977.6	0.0950	6.3550	0.0000
Cs-134m	2.9080	h	0.10	5.3020E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5740E+15	926.7	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.8697E+13	899.4	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	7.7389E+16	649.5	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.1114E+14	570.4	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1829E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2767E+15	296.2	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2077E+15	295.5	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3039E+15	262.7	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6356E+13	201.6	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1159E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5102E+15	187.1	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1010E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7957E+15	67.15	0.1040	0.5680	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 658
Total activity (Ci) = 4.05836E+07

Total number of decays = 1.02734E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.14959
Average chain length = 1.0247

Average gamma E (MeV) = 0.93301
Average beta E (MeV) = 0.38702
Average alpha E (MeV) = 5.35221E-03

Composite Exposure Rate Conversion Factor = 16.6736736 R/hr per Ci/m2
Composite ECF per FGR table = 9.68329334 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.6626368 Rem/hr per Ci/m2

Ground Source

Point in time = 0.143992454 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.1040E+19	1.1286E+07	1.7790	1.2470	0.0000
Na-24m	0.20200E-01	s	0.99	6.6915E+15	6.2058E+06	0.4720	0.0008	0.0000
Ta-182m	0.28300	s	1.06	7.7871E+16	5.1548E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	6.6028E+16	4.0109E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	6.0871E+16	1.5949E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2814E+17	3.2926E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.6028E+16	2.7802E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9287E+17	1.9322E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	6.0436E+15	1.3511E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2735E+18	9.7619E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9367E+17	2.4484E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8404E+16	1.7931E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1095E+19	1.4295E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3486E+15	7930.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6855E+15	6260.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6017E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1331E+15	3915.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1358E+17	3750.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9541E+16	3645.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0409E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9879E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.8613E+14	1803.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0549E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	3.0109E+14	1410.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8730E+15	1304.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9339E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5263E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4993E+15	1259.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4333E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3019E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5731E+15	926.5	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.7753E+13	877.5	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	7.9105E+16	664.0	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.1054E+14	567.3	3.4820	2.2990	0.0000
B-12	0.20200E-01	s	0.10	3.9376E+11	365.2	0.0950	6.3550	0.0000
Ba-139	1.3840	h	0.34	9.1828E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2764E+15	296.2	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2074E+15	295.4	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3036E+15	262.6	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.6143E+13	200.0	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1159E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5100E+15	187.0	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1009E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8920E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7956E+15	67.15	0.1040	0.5680	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
 Current number of atoms = 6.702196336155334D+20
 Difference in atom count = 1.70E+06
 Fractional difference = 2.54E-15

Total number of nuclides = 658
 Total activity (Ci) = 2.94772E+07

Total number of decays = 1.06364E+18
 Asympt number of decays = 6.86756E+20
 Percent of decays = 0.15488
 Average chain length = 1.0247

Average gamma E (MeV) = 1.0991
 Average beta E (MeV) = 0.53050
 Average alpha E (MeV) = 7.19595E-03

Composite Exposure Rate Conversion Factor = 19.5776730 R/hr per Ci/m2
 Composite ECF per FGR table = 13.2641001 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 13.7390518 Rem/hr per Ci/m2

Ground Source

Point in time = 0.179832458 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.1025E+19	1.1284E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	7.1326E+16	4.7216E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	6.0918E+16	3.7005E+06	1.9230	0.1070	0.0000
Na-24m	0.20200E-01	s	0.99	1.9562E+15	1.8142E+06	0.4720	0.0008	0.0000
Cl-38m	0.71500	s	0.42	5.8793E+16	1.5404E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2770E+17	3.2882E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.5664E+16	2.7170E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9261E+17	1.9296E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	5.8670E+15	1.3116E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2734E+18	9.7615E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9364E+17	2.4481E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8381E+16	1.7923E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1099E+19	1.4296E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3381E+15	7919.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6772E+15	6245.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6017E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1279E+15	3911.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1358E+17	3749.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9536E+16	3645.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0408E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9876E+16	2147.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.8374E+14	1796.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0549E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.9923E+14	1401.	1.0026	0.1430	0.0000
O-19	26.910	s	0.30	1.8713E+15	1303.	0.9398	1.7770	0.0000
Eu-154m	46.400	m	1.08	1.9339E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5262E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4976E+15	1258.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4332E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3019E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5718E+15	926.4	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.6607E+13	850.9	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	8.1183E+16	681.4	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0979E+14	563.5	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1828E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2760E+15	296.1	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2070E+15	295.4	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3033E+15	262.5	0.4400	0.1120	0.0000
C-15	2.4490	s	0.20	2.5879E+13	198.0	3.3580	2.9960	0.0000
Rb-88	17.800	m	0.56	1.1159E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5098E+15	187.0	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1009E+16	116.3	0.0003	0.3216	0.0000
B-12	0.20200E-01	s	0.10	1.1511E+11	106.8	0.0950	6.3550	0.0000
Hf-180m	5.5000	h	1.82	8.8919E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7956E+15	67.14	0.1040	0.5680	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 656
Total activity (Ci) = 2.42742E+07

Total number of decays = 1.09869E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.15998
Average chain length = 1.0247

Average gamma E (MeV) = 1.2228
Average beta E (MeV) = 0.64122
Average alpha E (MeV) = 8.48311E-03

Composite Exposure Rate Conversion Factor = 21.7441483 R/hr per Ci/m2
Composite ECF per FGR table = 16.0114994 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.2843876 Rem/hr per Ci/m2

Ground Source

Point in time = 0.224593058 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.1006E+19	1.1281E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	6.3920E+16	4.2313E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	5.5088E+16	3.3463E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	5.6296E+16	1.4750E+06	0.6710	0.0000	0.0000
Na-24m	0.20200E-01	s	0.99	4.2109E+14	3.9052E+05	0.4720	0.0008	0.0000
Hf-179m	18.670	s	0.21	3.2716E+17	3.2828E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.5220E+16	2.6401E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9229E+17	1.9264E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	5.6538E+15	1.2639E+05	0.0370	6.2000	1.5700
Co-60m	10.470	m	0.38	3.2732E+18	9.7611E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9360E+17	2.4478E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8351E+16	1.7914E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3250E+15	7905.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6669E+15	6228.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6016E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1214E+15	3906.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1357E+17	3749.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9530E+16	3644.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0408E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9872E+16	2146.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.8077E+14	1789.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0549E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.9692E+14	1391.	1.0026	0.1430	0.0000
Eu-154m	46.400	m	1.08	1.9339E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8692E+15	1301.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5260E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4955E+15	1257.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4330E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3019E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5703E+15	926.2	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.5225E+13	818.7	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	8.3679E+16	702.3	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0886E+14	558.7	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1827E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2755E+15	296.0	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2065E+15	295.4	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3028E+15	262.4	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1158E+16	195.7	0.6370	2.0700	0.0000
C-15	2.4490	s	0.20	2.5553E+13	195.5	3.3580	2.9960	0.0000
Sb-122m	4.1900	m	2.15	2.5094E+15	187.0	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1009E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8919E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7954E+15	67.14	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8565E+15	61.09	0.0766	0.1090	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 660
Total activity (Ci) = 2.19245E+07

Total number of decays = 1.13664E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.16551
Average chain length = 1.0247

Average gamma E (MeV) = 1.2894
Average beta E (MeV) = 0.70628
Average alpha E (MeV) = 9.05086E-03

Composite Exposure Rate Conversion Factor = 22.9196453 R/hr per Ci/m2
Composite ECF per FGR table = 17.6061401 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1179314 Rem/hr per Ci/m2

Ground Source

Point in time = 0.280494660 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0983E+19	1.1278E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	5.5741E+16	3.6899E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	4.8584E+16	2.9512E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	5.3326E+16	1.3972E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2648E+17	3.2760E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.4684E+16	2.5470E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9189E+17	1.9224E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	5.3983E+15	1.2068E+05	0.0370	6.2000	0.0000
Co-60m	10.470	m	0.38	3.2730E+18	9.7605E+04	0.0066	0.0536	0.0000
Na-24m	0.20200E-01	s	0.99	6.1845E+13	5.7356E+04	0.4720	0.0008	0.0000
Si-31	2.6200	h	0.38	1.9520E+19	3.8770E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9355E+17	2.4474E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8314E+16	1.7903E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.3087E+15	7887.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6540E+15	6206.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6015E+17	5043.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1134E+15	3900.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1356E+17	3749.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9522E+16	3644.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0407E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9868E+16	2146.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.7708E+14	1779.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0548E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.9405E+14	1377.	1.0026	0.1430	0.0000
Eu-154m	46.400	m	1.08	1.9339E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8665E+15	1299.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5257E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4929E+15	1255.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4327E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3019E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5684E+15	926.0	0.5990	0.0652	0.0000
Pb-207m	0.80600	s	0.74	3.3572E+13	780.3	1.4990	0.0000	0.0000
Cl-38	37.200	m	0.27	8.6647E+16	727.2	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0771E+14	552.8	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1826E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2749E+15	296.0	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2059E+15	295.4	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3023E+15	262.3	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1158E+16	195.7	0.6370	2.0700	0.0000
C-15	2.4490	s	0.20	2.5152E+13	192.4	3.3580	2.9960	0.0000
Sb-122m	4.1900	m	2.15	2.5091E+15	187.0	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1009E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8919E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7953E+15	67.14	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8564E+15	61.08	0.0766	0.1090	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155355D+20

Total number of nuclides = 658
Total activity (Ci) = 2.05575E+07

Total number of decays = 1.18045E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.17189
Average chain length = 1.0247

Average gamma E (MeV) = 1.3272
Average beta E (MeV) = 0.74881
Average alpha E (MeV) = 9.21654E-03

Composite Exposure Rate Conversion Factor = 23.5923977 R/hr per Ci/m2
Composite ECF per FGR table = 18.6317196 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5899277 Rem/hr per Ci/m2

Ground Source

Point in time = 0.350310326 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0954E+19	1.1274E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	4.6980E+16	3.1099E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	4.1528E+16	2.5226E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	4.9837E+16	1.3058E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2564E+17	3.2675E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.4040E+16	2.4354E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9140E+17	1.9174E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	5.0954E+15	1.1391E+05	0.0370	6.2000	0.0000
Co-60m	10.470	m	0.38	3.2727E+18	9.7597E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9519E+19	3.8769E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7610E+19	3.5491E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9348E+17	2.4468E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8268E+16	1.7889E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.2883E+15	7865.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6380E+15	6179.	1.6340	2.4810	0.0000
Na-24m	0.20200E-01	s	0.99	5.6348E+12	5226.	0.4720	0.0008	0.0000
Th-233	22.300	m	0.45	3.6013E+17	5042.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.1033E+15	3893.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1355E+17	3749.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9513E+16	3643.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0406E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9862E+16	2146.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.7250E+14	1767.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0548E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.9052E+14	1361.	1.0026	0.1430	0.0000
Eu-154m	46.400	m	1.08	1.9338E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8631E+15	1297.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5254E+16	1260.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4897E+15	1254.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4324E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3019E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5660E+15	925.7	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	9.0135E+16	756.5	1.5110	1.5200	0.0000
Pb-207m	0.80600	s	0.74	3.1615E+13	734.8	1.4990	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0629E+14	545.5	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1826E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2742E+15	295.9	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2052E+15	295.3	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.3016E+15	262.2	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1157E+16	195.7	0.6370	2.0700	0.0000
C-15	2.4490	s	0.20	2.4660E+13	188.6	3.3580	2.9960	0.0000
Sb-122m	4.1900	m	2.15	2.5086E+15	186.9	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1009E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8919E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7951E+15	67.14	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8562E+15	61.08	0.0766	0.1090	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 660
Total activity (Ci) = 1.93819E+07

Total number of decays = 1.23198E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.17939
Average chain length = 1.0247

Average gamma E (MeV) = 1.3597
Average beta E (MeV) = 0.78893
Average alpha E (MeV) = 9.22704E-03

Composite Exposure Rate Conversion Factor = 24.1749039 R/hr per Ci/m2
Composite ECF per FGR table = 19.5933037 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.9958115 Rem/hr per Ci/m2

Ground Source

Point in time = 0.437503278 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0917E+19	1.1269E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	3.7946E+16	2.5119E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	3.4138E+16	2.0737E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	4.5797E+16	1.1999E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2458E+17	3.2569E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.3276E+16	2.3029E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9078E+17	1.9112E+05	0.0883	0.0523	0.0000
Li-8	0.83800	s	0.72	4.7409E+15	1.0598E+05	0.0370	6.2000	0.0000
Co-60m	10.470	m	0.38	3.2724E+18	9.7588E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9519E+19	3.8769E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7609E+19	3.5490E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9340E+17	2.4462E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8210E+16	1.7871E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.2630E+15	7838.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.6181E+15	6145.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6012E+17	5042.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.0908E+15	3883.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1354E+17	3748.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9501E+16	3643.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0406E+17	2715.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9855E+16	2146.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.6683E+14	1752.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0547E+17	1559.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.8616E+14	1340.	1.0026	0.1430	0.0000
Eu-154m	46.400	m	1.08	1.9338E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8589E+15	1294.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5250E+16	1259.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4857E+15	1252.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4320E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3018E+17	948.8	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5630E+15	925.3	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	9.4172E+16	790.4	1.5110	1.5200	0.0000
Pb-207m	0.80600	s	0.74	2.9331E+13	681.7	1.4990	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0454E+14	536.6	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1824E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2732E+15	295.7	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2042E+15	295.3	1.3790	0.9765	0.0000
Na-24m	0.20200E-01	s	0.99	2.8280E+11	262.3	0.4720	0.0008	0.0000
Sb-124m	1.5500	m	5.38	1.3008E+15	262.0	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1157E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5080E+15	186.9	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	2.4059E+13	184.0	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1008E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8919E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7949E+15	67.13	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8560E+15	61.08	0.0766	0.1090	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155339D+20

Total number of nuclides = 658
Total activity (Ci) = 1.81960E+07

Total number of decays = 1.29253E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.18821
Average chain length = 1.0247

Average gamma E (MeV) = 1.3954
Average beta E (MeV) = 0.83407
Average alpha E (MeV) = 9.14451E-03

Composite Exposure Rate Conversion Factor = 24.8169079 R/hr per Ci/m2
Composite ECF per FGR table = 20.6794567 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 17.4428539 Rem/hr per Ci/m2

Ground Source

Point in time = 0.546398699 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0872E+19	1.1263E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	2.9062E+16	1.9238E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	2.6726E+16	1.6235E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	4.1209E+16	1.0797E+06	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2328E+17	3.2438E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.2380E+16	2.1474E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.9001E+17	1.9035E+05	0.0883	0.0523	0.0000
Co-60m	10.470	m	0.38	3.2720E+18	9.7576E+04	0.0066	0.0536	0.0000
Li-8	0.83800	s	0.72	4.3325E+15	9.6854E+04	0.0370	6.2000	0.0000
Si-31	2.6200	h	0.38	1.9519E+19	3.8769E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7609E+19	3.5490E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9331E+17	2.4453E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8138E+16	1.7849E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.2315E+15	7804.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.5935E+15	6103.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6010E+17	5042.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.0751E+15	3871.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1352E+17	3748.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9486E+16	3642.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0405E+17	2714.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9847E+16	2145.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.5980E+14	1734.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0547E+17	1558.	0.0087	0.6440	0.0000
Hf-178m	4.0000	s	7.50	2.8081E+14	1315.	1.0026	0.1430	0.0000
Eu-154m	46.400	m	1.08	1.9337E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8537E+15	1290.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5245E+16	1259.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4806E+15	1249.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4315E+16	1229.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3018E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5593E+15	924.9	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	9.8757E+16	828.9	1.5110	1.5200	0.0000
Pb-207m	0.80600	s	0.74	2.6709E+13	620.8	1.4990	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	1.0240E+14	525.6	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1823E+16	345.3	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2720E+15	295.6	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2030E+15	295.2	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.2997E+15	261.8	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1156E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5072E+15	186.8	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	2.3328E+13	178.5	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.1008E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8918E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7946E+15	67.13	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8558E+15	61.07	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155357D+20

Total number of nuclides = 658
Total activity (Ci) = 1.70040E+07

Total number of decays = 1.36335E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.19852
Average chain length = 1.0247

Average gamma E (MeV) = 1.4358
Average beta E (MeV) = 0.88526
Average alpha E (MeV) = 8.94268E-03

Composite Exposure Rate Conversion Factor = 25.5414562 R/hr per Ci/m2
Composite ECF per FGR table = 21.9195099 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 17.9479332 Rem/hr per Ci/m2

Ground Source

Point in time = 0.682398140 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0815E+19	1.1255E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	2.0829E+16	1.3788E+06	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	1.9687E+16	1.1959E+06	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	3.6119E+16	9.4635E+05	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.2165E+17	3.2274E+05	0.2370	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.1345E+16	1.9679E+05	1.0640	0.2404	0.0000
Sc-46m	18.700	s	0.37	1.8906E+17	1.8940E+05	0.0883	0.0523	0.0000
Co-60m	10.470	m	0.38	3.2715E+18	9.7561E+04	0.0066	0.0536	0.0000
Li-8	0.83800	s	0.72	3.8716E+15	8.6550E+04	0.0370	6.2000	1.5700
Si-31	2.6200	h	0.38	1.9519E+19	3.8768E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7609E+19	3.5490E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9318E+17	2.4443E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.8048E+16	1.7821E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.1923E+15	7761.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.5629E+15	6051.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6007E+17	5041.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.0557E+15	3856.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1351E+17	3747.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9468E+16	3641.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0403E+17	2714.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9836E+16	2144.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.5114E+14	1711.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0546E+17	1558.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9337E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8472E+15	1286.	0.9398	1.7770	0.0000
Hf-178m	4.0000	s	7.50	2.7427E+14	1285.	1.0026	0.1430	0.0000
Nb-94m	6.2600	m	0.16	2.5238E+16	1259.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4743E+15	1246.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4309E+16	1228.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3018E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5546E+15	924.3	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	1.0384E+17	871.6	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Pb-207m	0.80600	s	0.74	2.3761E+13	552.3	1.4990	0.0000	0.0000
Al-30	3.6500	s	1.64	9.9793E+13	512.2	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1821E+16	345.2	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2705E+15	295.4	0.0195	0.6080	0.0011
Al-29	6.5600	m	0.91	6.2015E+15	295.2	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.2984E+15	261.5	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1155E+16	195.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5063E+15	186.8	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	2.2447E+13	171.7	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1007E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8918E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7943E+15	67.13	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8555E+15	61.07	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 661
Total activity (Ci) = 1.58590E+07

Total number of decays = 1.44589E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.21054
Average chain length = 1.0247

Average gamma E (MeV) = 1.4798
Average beta E (MeV) = 0.94093
Average alpha E (MeV) = 8.56818E-03

Composite Exposure Rate Conversion Factor = 26.3281956 R/hr per Ci/m2
Composite ECF per FGR table = 23.2799854 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 18.4973145 Rem/hr per Ci/m2

Ground Source

Point in time = 0.852248371 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0745E+19	1.1245E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	1.3740E+16	9.0956E+05	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	1.3440E+16	8.1641E+05	1.9230	0.1070	0.0000
Cl-38m	0.71500	s	0.42	3.0635E+16	8.0267E+05	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.1963E+17	3.2072E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.8787E+17	1.8821E+05	0.0883	0.0523	0.0000
Hf-177m	1.0800	s	5.56	1.0174E+16	1.7647E+05	1.0640	0.2404	0.0000
Co-60m	10.470	m	0.38	3.2709E+18	9.7543E+04	0.0066	0.0536	0.0000
Li-8	0.83800	s	0.72	3.3641E+15	7.5206E+04	0.0370	6.2000	0.0000
Si-31	2.6200	h	0.38	1.9519E+19	3.8768E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7609E+19	3.5489E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9303E+17	2.4430E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.7936E+16	1.7787E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.1437E+15	7709.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6522.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.5251E+15	5987.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6004E+17	5041.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.0315E+15	3838.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1348E+17	3746.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9445E+16	3639.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0401E+17	2714.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9822E+16	2144.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.4048E+14	1683.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0545E+17	1558.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9336E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8392E+15	1280.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5230E+16	1258.	0.0117	0.0349	0.0000
Hf-178m	4.0000	s	7.50	2.6632E+14	1247.	1.0026	0.1430	0.0000
Ne-23	37.200	s	0.54	2.4665E+15	1242.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4301E+16	1228.	3.1700	0.8697	0.0000
Cs-134m	2.9080	h	0.10	5.3017E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5488E+15	923.6	0.5990	0.0652	0.0000
Cl-38	37.200	m	0.27	1.0932E+17	917.6	1.5110	1.5200	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	9.6625E+13	495.9	3.4820	2.2990	0.0000
Pb-207m	0.80600	s	0.74	2.0532E+13	477.2	1.4990	0.0000	0.0000
Ba-139	1.3840	h	0.34	9.1819E+16	345.2	0.0454	0.8990	0.0000
Ag-108	2.4000	m	0.83	2.2687E+15	295.1	0.0195	0.6080	0.0000
Al-29	6.5600	m	0.91	6.1997E+15	295.1	1.3790	0.9765	0.0000
Sb-124m	1.5500	m	5.38	1.2967E+15	261.2	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1154E+16	195.6	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5051E+15	186.7	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	2.1394E+13	163.7	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.1007E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8917E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7939E+15	67.12	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8551E+15	61.06	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 660
Total activity (Ci) = 1.48215E+07

Total number of decays = 1.54210E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.22455
Average chain length = 1.0247

Average gamma E (MeV) = 1.5248
Average beta E (MeV) = 0.99774
Average alpha E (MeV) = 7.96632E-03

Composite Exposure Rate Conversion Factor = 27.1325703 R/hr per Ci/m2
Composite ECF per FGR table = 24.6841488 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 19.0604172 Rem/hr per Ci/m2

Ground Source

Point in time = 1.06437480 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0656E+19	1.1232E+07	1.7790	1.2470	0.0000
Cl-38m	0.71500	s	0.42	2.4941E+16	6.5348E+05	0.6710	0.0000	0.0000
Ta-182m	0.28300	s	1.06	8.1725E+15	5.4099E+05	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	8.3434E+15	5.0682E+05	1.9230	0.1070	0.0000
Hf-179m	18.670	s	0.21	3.1712E+17	3.1820E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.8640E+17	1.8674E+05	0.0883	0.0523	0.0000
Hf-177m	1.0800	s	5.56	8.8786E+15	1.5401E+05	1.0640	0.2404	0.0000
Co-60m	10.470	m	0.38	3.2702E+18	9.7520E+04	0.0066	0.0536	0.0000
Li-8	0.83800	s	0.72	2.8227E+15	6.3103E+04	0.0370	6.2000	1.5700
Si-31	2.6200	h	0.38	1.9518E+19	3.8767E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7609E+19	3.5489E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9284E+17	2.4414E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.7797E+16	1.7744E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.0835E+15	7644.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.4784E+15	5908.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.6000E+17	5040.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	5.0015E+15	3815.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1345E+17	3745.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9417E+16	3638.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0399E+17	2714.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9806E+16	2143.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.2740E+14	1648.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0544E+17	1558.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9335E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8292E+15	1273.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5220E+16	1258.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4568E+15	1237.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4292E+16	1228.	3.1700	0.8697	0.0000
Hf-178m	4.0000	s	7.50	2.5671E+14	1202.	1.0026	0.1430	0.0000
Cl-38	37.200	m	0.27	1.1501E+17	965.3	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.3016E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5416E+15	922.7	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	9.2810E+13	476.3	3.4820	2.2990	0.0000
Pb-207m	0.80600	s	0.74	1.7108E+13	397.6	1.4990	0.0000	0.0000
Ba-139	1.3840	h	0.34	9.1816E+16	345.2	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	6.1974E+15	295.0	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2664E+15	294.8	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2947E+15	260.8	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1152E+16	195.6	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5036E+15	186.6	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	2.0147E+13	154.1	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0650E+17	125.6	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.1006E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8917E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7934E+15	67.11	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8546E+15	61.05	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 659
Total activity (Ci) = 1.39429E+07

Total number of decays = 1.65474E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.24095
Average chain length = 1.0247

Average gamma E (MeV) = 1.5676
Average beta E (MeV) = 1.0510
Average alpha E (MeV) = 7.10552E-03

Composite Exposure Rate Conversion Factor = 27.8933563 R/hr per Ci/m2
Composite ECF per FGR table = 26.0207043 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 19.5948906 Rem/hr per Ci/m2

Ground Source

Point in time = 1.32929909 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0546E+19	1.1217E+07	1.7790	1.2470	0.0000
Cl-38m	0.71500	s	0.42	1.9292E+16	5.0546E+05	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.1401E+17	3.1509E+05	0.2370	0.0000	0.0000
Ta-182m	0.28300	s	1.06	4.2712E+15	2.8274E+05	0.0017	0.0122	0.0000
Ba-136m	0.30840	s	0.62	4.5999E+15	2.7942E+05	1.9230	0.1070	0.0000
Sc-46m	18.700	s	0.37	1.8458E+17	1.8491E+05	0.0883	0.0523	0.0000
Hf-177m	1.0800	s	5.56	7.4903E+15	1.2993E+05	1.0640	0.2404	0.0000
Co-60m	10.470	m	0.38	3.2692E+18	9.7492E+04	0.0066	0.0536	0.0000
Li-8	0.83800	s	0.72	2.2673E+15	5.0685E+04	0.0370	6.2000	0.0000
Si-31	2.6200	h	0.38	1.9518E+19	3.8767E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7608E+19	3.5488E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9260E+17	2.4394E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.7623E+16	1.7691E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	7.0089E+15	7564.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.4210E+15	5810.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.5995E+17	5040.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	4.9642E+15	3787.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1342E+17	3744.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9381E+16	3635.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0397E+17	2713.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9785E+16	2142.	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	6.1145E+14	1607.	4.6030	2.6930	0.0000
Ga-70	21.130	m	0.14	1.0542E+17	1558.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9334E+17	1301.	0.0842	0.0000	0.0000
O-19	26.910	s	0.30	1.8167E+15	1265.	0.9398	1.7770	0.0000
Nb-94m	6.2600	m	0.16	2.5208E+16	1257.	0.0117	0.0349	0.0000
Ne-23	37.200	s	0.54	2.4447E+15	1231.	0.1653	1.8960	0.0000
Ca-49	8.7200	m	0.23	3.4280E+16	1227.	3.1700	0.8697	0.0000
Hf-178m	4.0000	s	7.50	2.4519E+14	1148.	1.0026	0.1430	0.0000
Cl-38	37.200	m	0.27	1.2065E+17	1013.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.3015E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5325E+15	921.6	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	8.8256E+13	453.0	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1813E+16	345.2	0.0454	0.8990	0.0000
Pb-207m	0.80600	s	0.74	1.3623E+13	316.6	1.4990	0.0000	0.0000
Al-29	6.5600	m	0.91	6.1945E+15	294.8	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2635E+15	294.5	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2921E+15	260.3	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1150E+16	195.6	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.5018E+15	186.4	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	1.8692E+13	143.0	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0649E+17	125.6	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.1005E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8916E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7927E+15	67.10	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8540E+15	61.03	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155343D+20

Total number of nuclides = 658
Total activity (Ci) = 1.32520E+07

Total number of decays = 1.78774E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.26032
Average chain length = 1.0247

Average gamma E (MeV) = 1.6047
Average beta E (MeV) = 1.0960
Average alpha E (MeV) = 6.00484E-03

Composite Exposure Rate Conversion Factor = 28.5494061 R/hr per Ci/m2
Composite ECF per FGR table = 27.1722202 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.0581818 Rem/hr per Ci/m2

Ground Source

Point in time = 1.66016436 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0409E+19	1.1198E+07	1.7790	1.2470	0.0000
Cl-38m	0.71500	s	0.42	1.3998E+16	3.6677E+05	0.6710	0.0000	0.0000
Hf-179m	18.670	s	0.21	3.1018E+17	3.1124E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.8233E+17	1.8266E+05	0.0883	0.0523	0.0000
Ba-136m	0.30840	s	0.62	2.1867E+15	1.3283E+05	1.9230	0.1070	0.0000
Ta-182m	0.28300	s	1.06	1.8994E+15	1.2573E+05	0.0017	0.0122	0.0000
Hf-177m	1.0800	s	5.56	6.0573E+15	1.0507E+05	1.0640	0.2404	0.0000
Co-60m	10.470	m	0.38	3.2680E+18	9.7456E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9518E+19	3.8766E+04	0.0018	0.5952	0.0000
Li-8	0.83800	s	0.72	1.7244E+15	3.8550E+04	0.0370	6.2000	0.0000
Mn-56	2.5820	h	0.19	1.7608E+19	3.5487E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9230E+17	2.4370E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.7407E+16	1.7625E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1101E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360	s	0.29	6.9170E+15	7464.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5490E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.3506E+15	5691.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.5989E+17	5039.	0.0369	0.4043	0.0000
Ag-110	24.560	s	0.45	4.9181E+15	3751.	0.0340	1.1780	0.0000
Mg-27	9.4580	m	0.13	1.1337E+17	3743.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9336E+16	3633.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0393E+17	2713.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9758E+16	2140.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0540E+17	1558.	0.0087	0.6440	0.0000
N-16	7.1300	s	0.28	5.9210E+14	1556.	4.6030	2.6930	0.0000
Eu-154m	46.400	m	1.08	1.9332E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5193E+16	1257.	0.0117	0.0349	0.0000
O-19	26.910	s	0.30	1.8013E+15	1254.	0.9398	1.7770	0.0000
Ca-49	8.7200	m	0.23	3.4265E+16	1227.	3.1700	0.8697	0.0000
Ne-23	37.200	s	0.54	2.4297E+15	1224.	0.1653	1.8960	0.0000
Hf-178m	4.0000	s	7.50	2.3152E+14	1084.	1.0026	0.1430	0.0000
Cl-38	37.200	m	0.27	1.2593E+17	1057.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.3014E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.5213E+15	920.2	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	8.2882E+13	425.4	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1809E+16	345.2	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	6.1909E+15	294.7	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2599E+15	294.0	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2890E+15	259.6	0.4400	0.1120	0.0000
Pb-207m	0.80600	s	0.74	1.0249E+13	238.2	1.4990	0.0000	0.0000
Rb-88	17.800	m	0.56	1.1148E+16	195.5	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.4995E+15	186.3	0.0704	0.0920	0.0000
C-15	2.4490	s	0.20	1.7021E+13	130.2	3.3580	2.9960	0.0000
Cu-64	12.700	h	0.02	3.0649E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1003E+16	116.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8915E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7919E+15	67.09	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8532E+15	61.02	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155343D+20

Total number of nuclides = 660
Total activity (Ci) = 1.27469E+07

Total number of decays = 1.94659E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.28345
Average chain length = 1.0247

Average gamma E (MeV) = 1.6339
Average beta E (MeV) = 1.1298
Average alpha E (MeV) = 4.74814E-03

Composite Exposure Rate Conversion Factor = 29.0629482 R/hr per Ci/m2
Composite ECF per FGR table = 28.0593929 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.4234734 Rem/hr per Ci/m2

Ground Source

Point in time = 2.07338262 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	8.0238E+19	1.1174E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	3.0546E+17	3.0650E+05	0.2370	0.0000	0.0000
Cl-38m	0.71500 s	0.42	9.3777E+15	2.4571E+05	0.6710	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.7956E+17	1.7988E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2665E+18	9.7412E+04	0.0066	0.0536	0.0000
Hf-177m	1.0800 s	5.56	4.6462E+15	8.0594E+04	1.0640	0.2404	0.0000
Ba-136m	0.30840 s	0.62	8.6387E+14	5.2475E+04	1.9230	0.1070	0.0000
Ta-182m	0.28300 s	1.06	6.9034E+14	4.5698E+04	0.0017	0.0122	0.0000
Si-31	2.6200 h	0.38	1.9517E+19	3.8764E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7607E+19	3.5486E+04	1.6910	0.8309	0.0000
Li-8	0.83800 s	0.72	1.2252E+15	2.7390E+04	0.0370	6.2000	1.5700
V-52	3.7450 m	0.13	2.9193E+17	2.4339E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.7138E+16	1.7542E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1100E+19	1.4297E+04	4.1240	0.5546	0.0000
Se-77m	17.360 s	0.29	6.8038E+15	7342.	0.0888	0.0000	0.0000
K-42	12.360 h	0.02	1.5489E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030 s	0.27	3.2647E+15	5545.	1.6340	2.4810	0.0000
Th-233	22.300 m	0.45	3.5981E+17	5038.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	1.1331E+17	3741.	0.8914	0.7010	0.0000
Ag-110	24.560 s	0.45	4.8611E+15	3708.	0.0340	1.1780	0.0000
Cu-66	5.1000 m	0.20	5.9281E+16	3629.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0389E+17	2712.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9726E+16	2139.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0538E+17	1557.	0.0087	0.6440	0.0000
N-16	7.1300 s	0.28	5.6878E+14	1494.	4.6030	2.6930	0.0000
Eu-154m	46.400 m	1.08	1.9330E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.5173E+16	1256.	0.0117	0.0349	0.0000
O-19	26.910 s	0.30	1.7822E+15	1241.	0.9398	1.7770	0.0000
Ca-49	8.7200 m	0.23	3.4246E+16	1226.	3.1700	0.8697	0.0000
Ne-23	37.200 s	0.54	2.4110E+15	1214.	0.1653	1.8960	0.0000
Cl-38	37.200 m	0.27	1.3053E+17	1096.	1.5110	1.5200	0.0000
Hf-178m	4.0000 s	7.50	2.1553E+14	1009.	1.0026	0.1430	0.0000
Cs-134m	2.9080 h	0.10	5.3013E+17	948.7	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.5072E+15	918.5	0.5990	0.0652	0.0000
Eu-152m	9.2750 h	0.10	1.0910E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500 s	1.64	7.6626E+13	393.3	3.4820	2.2990	0.0000
Ba-139	1.3840 h	0.34	9.1804E+16	345.2	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.1864E+15	294.4	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.2554E+15	293.4	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.2850E+15	258.8	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1145E+16	195.5	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4967E+15	186.0	0.0704	0.0920	0.0000
Pb-207m	0.80600 s	0.74	7.1838E+12	167.0	1.4990	0.0000	0.0000
Cu-64	12.700 h	0.02	3.0649E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.1002E+16	116.3	0.0003	0.3216	0.0000
C-15	2.4490 s	0.20	1.5142E+13	115.8	3.3580	2.9960	0.0000
Hf-180m	5.5000 h	1.82	8.8914E+16	84.13	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7909E+15	67.08	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8523E+15	61.00	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155357D+20

Total number of nuclides = 661
Total activity (Ci) = 1.23977E+07

Total number of decays = 2.13854E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.31140
Average chain length = 1.0247

Average gamma E (MeV) = 1.6551
Average beta E (MeV) = 1.1523
Average alpha E (MeV) = 3.46854E-03

Composite Exposure Rate Conversion Factor = 29.4328480 R/hr per Ci/m2
Composite ECF per FGR table = 28.6715221 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.6891003 Rem/hr per Ci/m2

Ground Source

Point in time = 2.58945155 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.0025E+19	1.1145E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	2.9966E+17	3.0068E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.7615E+17	1.7647E+05	0.0883	0.0523	0.0000
Cl-38m	0.71500	s	0.42	5.6862E+15	1.4898E+05	0.6710	0.0000	0.0000
Co-60m	10.470	m	0.38	3.2647E+18	9.7356E+04	0.0066	0.0536	0.0000
Hf-177m	1.0800	s	5.56	3.3362E+15	5.7870E+04	1.0640	0.2404	0.0000
Si-31	2.6200	h	0.38	1.9516E+19	3.8763E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7607E+19	3.5485E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9146E+17	2.4300E+04	1.4450	1.0680	0.0000
Li-8	0.83800	s	0.72	7.9951E+14	1.7873E+04	0.0370	6.2000	0.0000
Rb-86m	1.0170	m	0.33	5.6804E+16	1.7439E+04	0.5462	0.0099	0.0000
Ba-136m	0.30840	s	0.62	2.7084E+14	1.6452E+04	1.9230	0.1070	0.0000
Na-24	14.960	h	0.01	4.1100E+19	1.4297E+04	4.1240	0.5546	0.0000
Ta-182m	0.28300	s	1.06	1.9504E+14	1.2911E+04	0.0017	0.0122	0.0000
Se-77m	17.360	s	0.29	6.6650E+15	7192.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5489E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.1605E+15	5368.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.5972E+17	5036.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.1324E+17	3738.	0.8914	0.7010	0.0000
Ag-110	24.560	s	0.45	4.7908E+15	3654.	0.0340	1.1780	0.0000
Cu-66	5.1000	m	0.20	5.9212E+16	3625.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0384E+17	2712.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.9685E+16	2136.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0535E+17	1557.	0.0087	0.6440	0.0000
N-16	7.1300	s	0.28	5.4095E+14	1421.	4.6030	2.6930	0.0000
Eu-154m	46.400	m	1.08	1.9328E+17	1301.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5150E+16	1254.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4222E+16	1225.	3.1700	0.8697	0.0000
O-19	26.910	s	0.30	1.7587E+15	1224.	0.9398	1.7770	0.0000
Ne-23	37.200	s	0.54	2.3880E+15	1203.	0.1653	1.8960	0.0000
Cl-38	37.200	m	0.27	1.3420E+17	1126.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.3011E+17	948.6	0.0268	0.1090	0.0000
Hf-178m	4.0000	s	7.50	1.9709E+14	923.1	1.0026	0.1430	0.0000
Ba-137m	2.5520	m	0.04	7.4897E+15	916.3	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0909E+18	612.1	0.3070	0.5070	0.0000
Al-30	3.6500	s	1.64	6.9473E+13	356.6	3.4820	2.2990	0.0000
Ba-139	1.3840	h	0.34	9.1797E+16	345.2	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	6.1808E+15	294.2	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2498E+15	292.7	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2801E+15	257.9	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1141E+16	195.4	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.4931E+15	185.8	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0649E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.1000E+16	116.3	0.0003	0.3216	0.0000
Pb-207m	0.80600	s	0.74	4.6090E+12	107.1	1.4990	0.0000	0.0000
C-15	2.4490	s	0.20	1.3084E+13	100.1	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	8.8912E+16	84.12	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7896E+15	67.06	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8512E+15	60.97	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3400E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155367D+20
Difference in atom count = -1.57E+06
Fractional difference = -2.35E-15

Total number of nuclides = 660
Total activity (Ci) = 1.21602E+07

Total number of decays = 2.37277E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.34550
Average chain length = 1.0247

Average gamma E (MeV) = 1.6698
Average beta E (MeV) = 1.1660
Average alpha E (MeV) = 2.30762E-03

Composite Exposure Rate Conversion Factor = 29.6862774 R/hr per Ci/m2
Composite ECF per FGR table = 29.0574932 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.8729401 Rem/hr per Ci/m2

Ground Source

Point in time = 3.23397112 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	7.9760E+19	1.1108E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	2.9258E+17	2.9357E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.7200E+17	1.7231E+05	0.0883	0.0523	0.0000
Co-60m	10.470	m	0.38	3.2623E+18	9.7287E+04	0.0066	0.0536	0.0000
Cl-38m	0.71500	s	0.42	3.0442E+15	7.9760E+04	0.6710	0.0000	0.0000
Si-31	2.6200	h	0.38	1.9515E+19	3.8761E+04	0.0018	0.5952	0.0000
Hf-177m	1.0800	s	5.56	2.2060E+15	3.8266E+04	1.0640	0.2404	0.0000
Mn-56	2.5820	h	0.19	1.7606E+19	3.5483E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.9088E+17	2.4252E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.6390E+16	1.7312E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1100E+19	1.4296E+04	4.1240	0.5546	0.0000
Li-8	0.83800	s	0.72	4.6914E+14	1.0488E+04	0.0370	6.2000	1.5700
Se-77m	17.360	s	0.29	6.4957E+15	7010.	0.0888	0.0000	0.0000
K-42	12.360	h	0.02	1.5489E+19	6521.	0.2786	1.4310	0.0000
F-20	11.030	s	0.27	3.0350E+15	5155.	1.6340	2.4810	0.0000
Th-233	22.300	m	0.45	3.5960E+17	5035.	0.0369	0.4043	0.0000
Ba-136m	0.30840	s	0.62	6.3620E+13	3865.	1.9230	0.1070	0.0000
Mg-27	9.4580	m	0.13	1.1315E+17	3735.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.9125E+16	3620.	0.0978	1.0670	0.0000
Ag-110	24.560	s	0.45	4.7044E+15	3588.	0.0340	1.1780	0.0000
U-239	23.470	m	0.21	2.0378E+17	2711.	0.0521	0.3947	0.0000
Ta-182m	0.28300	s	1.06	4.0228E+13	2663.	0.0017	0.0122	0.0000
Ti-51	5.8000	m	0.52	3.9634E+16	2134.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0531E+17	1556.	0.0087	0.6440	0.0000
N-16	7.1300	s	0.28	5.0810E+14	1335.	4.6030	2.6930	0.0000
Eu-154m	46.400	m	1.08	1.9324E+17	1300.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5120E+16	1253.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4193E+16	1224.	3.1700	0.8697	0.0000
O-19	26.910	s	0.30	1.7297E+15	1204.	0.9398	1.7770	0.0000
Ne-23	37.200	s	0.54	2.3595E+15	1188.	0.1653	1.8960	0.0000
Cl-38	37.200	m	0.27	1.3682E+17	1148.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.3009E+17	948.6	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.4679E+15	913.7	0.5990	0.0652	0.0000
Hf-178m	4.0000	s	7.50	1.7626E+14	825.5	1.0026	0.1430	0.0000
Eu-152m	9.2750	h	0.10	1.0909E+18	612.1	0.3070	0.5070	0.0000
Ba-139	1.3840	h	0.34	9.1789E+16	345.1	0.0454	0.8990	0.0000
Al-30	3.6500	s	1.64	6.1470E+13	315.5	3.4820	2.2990	0.0000
Al-29	6.5600	m	0.91	6.1737E+15	293.8	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2428E+15	291.8	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2739E+15	256.6	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.1137E+16	195.3	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.4887E+15	185.5	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0648E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0997E+16	116.2	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8910E+16	84.12	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.0903E+13	83.40	3.3580	2.9960	0.0000
Sm-155	22.300	m	0.90	4.7880E+15	67.04	0.1040	0.5680	0.0000
Pb-207m	0.80600	s	0.74	2.6478E+12	61.54	1.4990	0.0000	0.0000
Ba-131m	14.600	m	1.37	2.8497E+15	60.94	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3399E+17	49.45	2.7080	0.5028	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155356D+20

Total number of nuclides = 662
Total activity (Ci) = 1.19919E+07

Total number of decays = 2.66058E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.38741
Average chain length = 1.0247

Average gamma E (MeV) = 1.6799
Average beta E (MeV) = 1.1741
Average alpha E (MeV) = 1.37307E-03

Composite Exposure Rate Conversion Factor = 29.8577366 R/hr per Ci/m2
Composite ECF per FGR table = 29.2876835 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.9982109 Rem/hr per Ci/m2

Ground Source

Point in time = 4.03891134 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.9430E+19	1.1062E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	2.8396E+17	2.8493E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.6694E+17	1.6724E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2594E+18	9.7201E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9514E+19	3.8759E+04	0.0018	0.5952	0.0000
Cl-38m	0.71500 s	0.42	1.3950E+15	3.6550E+04	0.6710	0.0000	0.0000
Mn-56	2.5820 h	0.19	1.7605E+19	3.5481E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.9016E+17	2.4191E+04	1.4450	1.0680	0.0000
Hf-177m	1.0800 s	5.56	1.3160E+15	2.2827E+04	1.0640	0.2404	0.0000
Rb-86m	1.0170 m	0.33	5.5877E+16	1.7155E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1099E+19	1.4296E+04	4.1240	0.5546	0.0000
Se-77m	17.360 s	0.29	6.2902E+15	6788.	0.0888	0.0000	0.0000
K-42	12.360 h	0.02	1.5489E+19	6521.	0.2786	1.4310	0.0000
Li-8	0.83800 s	0.72	2.4107E+14	5389.	0.0370	6.2000	0.0000
Th-233	22.300 m	0.45	3.5945E+17	5033.	0.0369	0.4043	0.0000
F-20	11.030 s	0.27	2.8853E+15	4901.	1.6340	2.4810	0.0000
Mg-27	9.4580 m	0.13	1.1304E+17	3732.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.9018E+16	3613.	0.0978	1.0670	0.0000
Ag-110	24.560 s	0.45	4.5987E+15	3508.	0.0340	1.1780	0.0000
U-239	23.470 m	0.21	2.0369E+17	2710.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9570E+16	2130.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0527E+17	1555.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9321E+17	1300.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.5082E+16	1251.	0.0117	0.0349	0.0000
N-16	7.1300 s	0.28	4.6985E+14	1235.	4.6030	2.6930	0.0000
Ca-49	8.7200 m	0.23	3.4157E+16	1223.	3.1700	0.8697	0.0000
O-19	26.910 s	0.30	1.6942E+15	1179.	0.9398	1.7770	0.0000
Ne-23	37.200 s	0.54	2.3243E+15	1171.	0.1653	1.8960	0.0000
Cl-38	37.200 m	0.27	1.3843E+17	1162.	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.3006E+17	948.5	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.4407E+15	910.3	0.5990	0.0652	0.0000
Hf-178m	4.0000 s	7.50	1.5331E+14	718.0	1.0026	0.1430	0.0000
Ba-136m	0.30840 s	0.62	1.0421E+13	633.0	1.9230	0.1070	0.0000
Eu-152m	9.2750 h	0.10	1.0909E+18	612.1	0.3070	0.5070	0.0000
Ta-182m	0.28300 s	1.06	5.6016E+12	370.8	0.0017	0.0122	0.0000
Ba-139	1.3840 h	0.34	9.1778E+16	345.1	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.1650E+15	293.4	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.2341E+15	290.7	0.0195	0.6080	0.0011
Al-30	3.6500 s	1.64	5.2756E+13	270.8	3.4820	2.2990	0.0000
Sb-124m	1.5500 m	5.38	1.2663E+15	255.1	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1131E+16	195.2	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4832E+15	185.0	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0648E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0994E+16	116.2	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8907E+16	84.12	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7860E+15	67.01	0.1040	0.5680	0.0000
C-15	2.4490 s	0.20	8.6813E+12	66.41	3.3580	2.9960	0.0000
Ba-131m	14.600 m	1.37	2.8479E+15	60.90	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3399E+17	49.45	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.6345E+14	40.88	0.0033	1.1010	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155353D+20

Total number of nuclides = 663
Total activity (Ci) = 1.18617E+07

Total number of decays = 3.01565E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.43912
Average chain length = 1.0247

Average gamma E (MeV) = 1.6867
Average beta E (MeV) = 1.1790
Average alpha E (MeV) = 7.13310E-04

Composite Exposure Rate Conversion Factor = 29.9746799 R/hr per Ci/m2
Composite ECF per FGR table = 29.4216194 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.0836945 Rem/hr per Ci/m2

Ground Source

Point in time = 5.04420424 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	7.9019E+19	1.1004E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	2.7356E+17	2.7449E+05	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	1.6083E+17	1.6112E+05	0.0883	0.0523	0.0000
Co-60m	10.470	m	0.38	3.2558E+18	9.7093E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9513E+19	3.8756E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7603E+19	3.5478E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.8926E+17	2.4117E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170	m	0.33	5.5242E+16	1.6960E+04	0.5462	0.0099	0.0000
Na-24	14.960	h	0.01	4.1099E+19	1.4296E+04	4.1240	0.5546	0.0000
Cl-38m	0.71500	s	0.42	5.2641E+14	1.3792E+04	0.6710	0.0000	0.0000
Hf-177m	1.0800	s	5.56	6.9030E+14	1.1974E+04	1.0640	0.2404	0.0000
K-42	12.360	h	0.02	1.5489E+19	6521.	0.2786	1.4310	0.0000
Se-77m	17.360	s	0.29	6.0427E+15	6521.	0.0888	0.0000	0.0000
Th-233	22.300	m	0.45	3.5926E+17	5030.	0.0369	0.4043	0.0000
F-20	11.030	s	0.27	2.7087E+15	4601.	1.6340	2.4810	0.0000
Mg-27	9.4580	m	0.13	1.1290E+17	3727.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.8883E+16	3605.	0.0978	1.0670	0.0000
Ag-110	24.560	s	0.45	4.4701E+15	3410.	0.0340	1.1780	0.0000
U-239	23.470	m	0.21	2.0359E+17	2708.	0.0521	0.3947	0.0000
Li-8	0.83800	s	0.72	1.0496E+14	2346.	0.0370	6.2000	1.5700
Ti-51	5.8000	m	0.52	3.9491E+16	2126.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0521E+17	1555.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9316E+17	1300.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.5036E+16	1249.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.4111E+16	1221.	3.1700	0.8697	0.0000
Cl-38	37.200	m	0.27	1.3926E+17	1169.	1.5110	1.5200	0.0000
O-19	26.910	s	0.30	1.6509E+15	1149.	0.9398	1.7770	0.0000
Ne-23	37.200	s	0.54	2.2812E+15	1149.	0.1653	1.8960	0.0000
N-16	7.1300	s	0.28	4.2611E+14	1120.	4.6030	2.6930	0.0000
Cs-134m	2.9080	h	0.10	5.3002E+17	948.5	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	7.4069E+15	906.2	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0909E+18	612.0	0.3070	0.5070	0.0000
Hf-178m	4.0000	s	7.50	1.2880E+14	603.2	1.0026	0.1430	0.0000
Ba-139	1.3840	h	0.34	9.1766E+16	345.0	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	6.1541E+15	292.9	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.2234E+15	289.2	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.2568E+15	253.2	0.4400	0.1120	0.0000
Al-30	3.6500	s	1.64	4.3588E+13	223.7	3.4820	2.2990	0.0000
Rb-88	17.800	m	0.56	1.1124E+16	195.1	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.4763E+15	184.5	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0648E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0990E+16	116.2	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8904E+16	84.12	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7835E+15	66.97	0.1040	0.5680	0.0000
Ba-136m	0.30840	s	0.62	1.0880E+12	66.09	1.9230	0.1070	0.0000
Ba-131m	14.600	m	1.37	2.8456E+15	60.86	0.0766	0.1090	0.0000
C-15	2.4490	s	0.20	6.5316E+12	49.96	3.3580	2.9960	0.0000
Ga-72	14.100	h	0.07	1.3399E+17	49.45	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	4.6193E+14	40.74	0.0033	1.1010	0.0000
Ta-182m	0.28300	s	1.06	4.7749E+11	31.61	0.0017	0.0122	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 658
Total activity (Ci) = 1.17490E+07

Total number of decays = 3.45466E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.50304
Average chain length = 1.0247

Average gamma E (MeV) = 1.6914
Average beta E (MeV) = 1.1822
Average alpha E (MeV) = 3.13545E-04

Composite Exposure Rate Conversion Factor = 30.0564842 R/hr per Ci/m2
Composite ECF per FGR table = 29.4997368 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.1429939 Rem/hr per Ci/m2

Ground Source

Point in time = 6.29971647 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.8510E+19	1.0934E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	2.6110E+17	2.6199E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.5352E+17	1.5380E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2513E+18	9.6958E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9511E+19	3.8752E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7602E+19	3.5475E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.8815E+17	2.4023E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.4460E+16	1.6720E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1098E+19	1.4296E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5488E+19	6521.	0.2786	1.4310	0.0000
Se-77m	17.360 s	0.29	5.7473E+15	6202.	0.0888	0.0000	0.0000
Hf-177m	1.0800 s	5.56	3.0838E+14	5349.	1.0640	0.2404	0.0000
Th-233	22.300 m	0.45	3.5903E+17	5027.	0.0369	0.4043	0.0000
F-20	11.030 s	0.27	2.5032E+15	4252.	1.6340	2.4810	0.0000
Cl-38m	0.71500 s	0.42	1.5586E+14	4084.	0.6710	0.0000	0.0000
Mg-27	9.4580 m	0.13	1.1273E+17	3721.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.8716E+16	3595.	0.0978	1.0670	0.0000
Ag-110	24.560 s	0.45	4.3145E+15	3291.	0.0340	1.1780	0.0000
U-239	23.470 m	0.21	2.0347E+17	2707.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9393E+16	2121.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0514E+17	1554.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9310E+17	1299.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4978E+16	1246.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.4055E+16	1219.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3957E+17	1171.	1.5110	1.5200	0.0000
Ne-23	37.200 s	0.54	2.2284E+15	1122.	0.1653	1.8960	0.0000
O-19	26.910 s	0.30	1.5984E+15	1113.	0.9398	1.7770	0.0000
N-16	7.1300 s	0.28	3.7715E+14	990.9	4.6030	2.6930	0.0000
Cs-134m	2.9080 h	0.10	5.2998E+17	948.4	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.3649E+15	901.1	0.5990	0.0652	0.0000
Li-8	0.83800 s	0.72	3.7154E+13	830.6	0.0370	6.2000	1.5700
Eu-152m	9.2750 h	0.10	1.0909E+18	612.0	0.3070	0.5070	0.0000
Hf-178m	4.0000 s	7.50	1.0362E+14	485.3	1.0026	0.1430	0.0000
Ba-139	1.3840 h	0.34	9.1750E+16	345.0	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.1405E+15	292.3	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.2100E+15	287.5	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.2451E+15	250.8	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1114E+16	195.0	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4678E+15	183.9	0.0704	0.0920	0.0000
Al-30	3.6500 s	1.64	3.4341E+13	176.3	3.4820	2.2990	0.0000
Cu-64	12.700 h	0.02	3.0647E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0985E+16	116.2	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8900E+16	84.11	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7804E+15	66.93	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8428E+15	60.79	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3399E+17	49.45	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.6004E+14	40.58	0.0033	1.1010	0.0000
C-15	2.4490 s	0.20	4.5781E+12	35.02	3.3580	2.9960	0.0000
Y-90m	3.1890 h	0.31	1.9003E+16	31.01	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155356D+20

Total number of nuclides = 654
Total activity (Ci) = 1.16386E+07

Total number of decays = 3.99780E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.58213
Average chain length = 1.0247

Average gamma E (MeV) = 1.6950
Average beta E (MeV) = 1.1847
Average alpha E (MeV) = 1.12046E-04

Composite Exposure Rate Conversion Factor = 30.1186829 R/hr per Ci/m2
Composite ECF per FGR table = 29.5492821 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.1873608 Rem/hr per Ci/m2

Ground Source

Point in time = 7.86772490 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.7878E+19	1.0846E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	2.4633E+17	2.4718E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.4485E+17	1.4511E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2457E+18	9.6791E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9509E+19	3.8748E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7600E+19	3.5471E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.8676E+17	2.3907E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.3499E+16	1.6425E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1097E+19	1.4296E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5488E+19	6521.	0.2786	1.4310	0.0000
Se-77m	17.360 s	0.29	5.3985E+15	5826.	0.0888	0.0000	0.0000
Th-233	22.300 m	0.45	3.5873E+17	5023.	0.0369	0.4043	0.0000
F-20	11.030 s	0.27	2.2683E+15	3853.	1.6340	2.4810	0.0000
Mg-27	9.4580 m	0.13	1.1251E+17	3714.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.8508E+16	3582.	0.0978	1.0670	0.0000
Ag-110	24.560 s	0.45	4.1277E+15	3149.	0.0340	1.1780	0.0000
U-239	23.470 m	0.21	2.0331E+17	2705.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9270E+16	2114.	0.3692	0.8684	0.0000
Hf-177m	1.0800 s	5.56	1.1273E+14	1955.	1.0640	0.2404	0.0000
Ga-70	21.130 m	0.14	1.0505E+17	1552.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9302E+17	1299.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4906E+16	1242.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.3984E+16	1217.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3963E+17	1172.	1.5110	1.5200	0.0000
Ne-23	37.200 s	0.54	2.1643E+15	1090.	0.1653	1.8960	0.0000
O-19	26.910 s	0.30	1.5351E+15	1069.	0.9398	1.7770	0.0000
Cs-134m	2.9080 h	0.10	5.2992E+17	948.3	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.3129E+15	894.7	0.5990	0.0652	0.0000
Cl-38m	0.71500 s	0.42	3.4085E+13	893.1	0.6710	0.0000	0.0000
N-16	7.1300 s	0.28	3.2382E+14	850.8	4.6030	2.6930	0.0000
Eu-152m	9.2750 h	0.10	1.0908E+18	612.0	0.3070	0.5070	0.0000
Hf-178m	4.0000 s	7.50	7.8966E+13	369.8	1.0026	0.1430	0.0000
Ba-139	1.3840 h	0.34	9.1730E+16	344.9	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.1236E+15	291.5	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.1933E+15	285.3	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.2307E+15	247.9	0.4400	0.1120	0.0000
Li-8	0.83800 s	0.72	1.0156E+13	227.0	0.0370	6.2000	1.5700
Rb-88	17.800 m	0.56	1.1103E+16	194.8	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4571E+15	183.1	0.0704	0.0920	0.0000
Al-30	3.6500 s	1.64	2.5497E+13	130.9	3.4820	2.2990	0.0000
Cu-64	12.700 h	0.02	3.0646E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0978E+16	116.1	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8896E+16	84.11	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7765E+15	66.88	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8393E+15	60.72	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3399E+17	49.45	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.5770E+14	40.37	0.0033	1.1010	0.0000
Y-90m	3.1890 h	0.31	1.9001E+16	31.01	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.4062E+16	26.11	0.3215	0.0674	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 656
Total activity (Ci) = 1.15179E+07

Total number of decays = 4.66948E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.67993
Average chain length = 1.0247

Average gamma E (MeV) = 1.6981
Average beta E (MeV) = 1.1870
Average alpha E (MeV) = 3.09505E-05

Composite Exposure Rate Conversion Factor = 30.1741028 R/hr per Ci/m2
Composite ECF per FGR table = 29.5888367 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.2262421 Rem/hr per Ci/m2

Ground Source

Point in time = 9.82601738 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.7096E+19	1.0737E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	2.2906E+17	2.2984E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.3471E+17	1.3495E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2387E+18	9.6582E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9506E+19	3.8742E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7597E+19	3.5466E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.8503E+17	2.3763E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.2322E+16	1.6063E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1096E+19	1.4295E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5488E+19	6521.	0.2786	1.4310	0.0000
Se-77m	17.360 s	0.29	4.9925E+15	5388.	0.0888	0.0000	0.0000
Th-233	22.300 m	0.45	3.5837E+17	5018.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	1.1224E+17	3705.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.8249E+16	3566.	0.0978	1.0670	0.0000
F-20	11.030 s	0.27	2.0057E+15	3406.	1.6340	2.4810	0.0000
Ag-110	24.560 s	0.45	3.9058E+15	2979.	0.0340	1.1780	0.0000
U-239	23.470 m	0.21	2.0312E+17	2702.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.9117E+16	2106.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0493E+17	1551.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9293E+17	1298.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4816E+16	1238.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.3896E+16	1214.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3957E+17	1171.	1.5110	1.5200	0.0000
Ne-23	37.200 s	0.54	2.0867E+15	1051.	0.1653	1.8960	0.0000
O-19	26.910 s	0.30	1.4596E+15	1016.	0.9398	1.7770	0.0000
Cs-134m	2.9080 h	0.10	5.2986E+17	948.2	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.2483E+15	886.8	0.5990	0.0652	0.0000
N-16	7.1300 s	0.28	2.6769E+14	703.3	4.6030	2.6930	0.0000
Eu-152m	9.2750 h	0.10	1.0908E+18	612.0	0.3070	0.5070	0.0000
Hf-177m	1.0800 s	5.56	3.2077E+13	556.4	1.0640	0.2404	0.0000
Ba-139	1.3840 h	0.34	9.1705E+16	344.8	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.1025E+15	290.5	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.1728E+15	282.7	0.0195	0.6080	0.0011
Hf-178m	4.0000 s	7.50	5.6243E+13	263.4	1.0026	0.1430	0.0000
Sb-124m	1.5500 m	5.38	1.2128E+15	244.3	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1089E+16	194.5	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4439E+15	182.1	0.0704	0.0920	0.0000
Cl-38m	0.71500 s	0.42	5.1060E+12	133.8	0.6710	0.0000	0.0000
Cu-64	12.700 h	0.02	3.0645E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0971E+16	116.1	0.0003	0.3216	0.0000
Al-30	3.6500 s	1.64	1.7579E+13	90.22	3.4820	2.2990	0.0000
Hf-180m	5.5000 h	1.82	8.8889E+16	84.10	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7716E+15	66.81	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8349E+15	60.63	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3398E+17	49.45	2.7080	0.5028	0.0000
Li-8	0.83800 s	0.72	2.0104E+12	44.94	0.0370	6.2000	1.5700
Cr-55	3.5400 m	0.85	4.5478E+14	40.11	0.0033	1.1010	0.0000
Y-90m	3.1890 h	0.31	1.8999E+16	31.00	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.4061E+16	26.10	0.3215	0.0674	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155343D+20

Total number of nuclides = 657
Total activity (Ci) = 1.13769E+07

Total number of decays = 5.49888E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 0.80070
Average chain length = 1.0247

Average gamma E (MeV) = 1.7013
Average beta E (MeV) = 1.1894
Average alpha E (MeV) = 6.20319E-06

Composite Exposure Rate Conversion Factor = 30.2317047 R/hr per Ci/m2
Composite ECF per FGR table = 29.6291904 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.2662525 Rem/hr per Ci/m2

Ground Source

Point in time = 12.2717333 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.6131E+19	1.0602E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	2.0918E+17	2.0989E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.2304E+17	1.2326E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2300E+18	9.6322E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9502E+19	3.8735E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7594E+19	3.5459E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.8289E+17	2.3585E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	5.0888E+16	1.5623E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1095E+19	1.4295E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5487E+19	6520.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.5792E+17	5011.	0.0369	0.4043	0.0000
Se-77m	17.360 s	0.29	4.5280E+15	4886.	0.0888	0.0000	0.0000
Mg-27	9.4580 m	0.13	1.1191E+17	3694.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.7927E+16	3546.	0.0978	1.0670	0.0000
F-20	11.030 s	0.27	1.7199E+15	2921.	1.6340	2.4810	0.0000
Ag-110	24.560 s	0.45	3.6453E+15	2781.	0.0340	1.1780	0.0000
U-239	23.470 m	0.21	2.0287E+17	2699.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.8927E+16	2096.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0479E+17	1549.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9281E+17	1297.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4704E+16	1232.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.3786E+16	1210.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3947E+17	1171.	1.5110	1.5200	0.0000
Ne-23	37.200 s	0.54	1.9938E+15	1004.	0.1653	1.8960	0.0000
O-19	26.910 s	0.30	1.3705E+15	954.1	0.9398	1.7770	0.0000
Cs-134m	2.9080 h	0.10	5.2977E+17	948.0	0.0268	0.1090	0.0000
Ba-137m	2.5520 m	0.04	7.1685E+15	877.0	0.5990	0.0652	0.0000
Eu-152m	9.2750 h	0.10	1.0907E+18	612.0	0.3070	0.5070	0.0000
N-16	7.1300 s	0.28	2.1104E+14	554.5	4.6030	2.6930	0.0000
Ba-139	1.3840 h	0.34	9.1673E+16	344.7	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.0763E+15	289.2	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.1473E+15	279.4	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.1909E+15	239.9	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1071E+16	194.2	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4275E+15	180.9	0.0704	0.0920	0.0000
Hf-178m	4.0000 s	7.50	3.6814E+13	172.4	1.0026	0.1430	0.0000
Cu-64	12.700 h	0.02	3.0644E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0961E+16	116.0	0.0003	0.3216	0.0000
Hf-177m	1.0800 s	5.56	6.6758E+12	115.8	1.0640	0.2404	0.0000
Hf-180m	5.5000 h	1.82	8.8882E+16	84.10	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7656E+15	66.72	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8294E+15	60.51	0.0766	0.1090	0.0000
Al-30	3.6500 s	1.64	1.1048E+13	56.70	3.4820	2.2990	0.0000
Ga-72	14.100 h	0.07	1.3398E+17	49.45	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.5117E+14	39.79	0.0033	1.1010	0.0000
Y-90m	3.1890 h	0.31	1.8996E+16	31.00	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.4058E+16	26.10	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8619E+17	24.06	2.3200	0.5340	0.0000
Br-82m	6.0900 m	1.15	3.8689E+14	19.84	0.0028	0.0306	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
 Current number of atoms = 6.702196336155332D+20
 Difference in atom count = 1.84E+06
 Fractional difference = 2.74E-15

Total number of nuclides = 657
 Total activity (Ci) = 1.12077E+07

Total number of decays = 6.52070E+18
 Asympt number of decays = 6.86756E+20
 Percent of decays = 0.94949
 Average chain length = 1.0247

Average gamma E (MeV) = 1.7049
 Average beta E (MeV) = 1.1921
 Average alpha E (MeV) = 8.33669E-07

Composite Exposure Rate Conversion Factor = 30.2962532 R/hr per Ci/m2
 Composite ECF per FGR table = 29.6748314 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 21.3109531 Rem/hr per Ci/m2

Ground Source

Point in time = 15.3261919 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.4942E+19	1.0437E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	1.8675E+17	1.8739E+05	0.2370	0.0000	0.0000
Sc-46m	18.700 s	0.37	1.0986E+17	1.1006E+05	0.0883	0.0523	0.0000
Co-60m	10.470 m	0.38	3.2191E+18	9.5998E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9498E+19	3.8727E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7590E+19	3.5451E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.8023E+17	2.3364E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	4.9153E+16	1.5090E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1093E+19	1.4294E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5486E+19	6520.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.5735E+17	5003.	0.0369	0.4043	0.0000
Se-77m	17.360 s	0.29	4.0081E+15	4325.	0.0888	0.0000	0.0000
Mg-27	9.4580 m	0.13	1.1149E+17	3681.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.7528E+16	3522.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0257E+17	2695.	0.0521	0.3947	0.0000
Ag-110	24.560 s	0.45	3.3442E+15	2551.	0.0340	1.1780	0.0000
F-20	11.030 s	0.27	1.4195E+15	2411.	1.6340	2.4810	0.0000
Ti-51	5.8000 m	0.52	3.8691E+16	2083.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	1.0462E+17	1546.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9266E+17	1296.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4565E+16	1225.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.3650E+16	1205.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3934E+17	1169.	1.5110	1.5200	0.0000
Ne-23	37.200 s	0.54	1.8835E+15	948.5	0.1653	1.8960	0.0000
Cs-134m	2.9080 h	0.10	5.2966E+17	947.8	0.0268	0.1090	0.0000
O-19	26.910 s	0.30	1.2668E+15	881.9	0.9398	1.7770	0.0000
Ba-137m	2.5520 m	0.04	7.0701E+15	865.0	0.5990	0.0652	0.0000
Eu-152m	9.2750 h	0.10	1.0907E+18	611.9	0.3070	0.5070	0.0000
N-16	7.1300 s	0.28	1.5682E+14	412.0	4.6030	2.6930	0.0000
Ba-139	1.3840 h	0.34	9.1634E+16	344.5	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.0437E+15	287.7	1.3790	0.9765	0.0000
Ag-108	2.4000 m	0.83	2.1160E+15	275.3	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.1641E+15	234.5	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1050E+16	193.8	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.4071E+15	179.4	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0643E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0949E+16	116.0	0.0003	0.3216	0.0000
Hf-178m	4.0000 s	7.50	2.1685E+13	101.6	1.0026	0.1430	0.0000
Hf-180m	5.5000 h	1.82	8.8872E+16	84.09	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7581E+15	66.62	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8226E+15	60.36	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3397E+17	49.44	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.4669E+14	39.40	0.0033	1.1010	0.0000
Al-30	3.6500 s	1.64	6.1854E+12	31.75	3.4820	2.2990	0.0000
Y-90m	3.1890 h	0.31	1.8992E+16	30.99	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.4055E+16	26.09	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8619E+17	24.06	2.3200	0.5340	0.0000
Br-82m	6.0900 m	1.15	3.8465E+14	19.72	0.0028	0.0306	0.0000
Sm-153	1.9280 d	0.01	1.5639E+17	17.59	0.0617	0.2700	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 656
Total activity (Ci) = 1.10034E+07

Total number of decays = 7.77572E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 1.1322
Average chain length = 1.0247

Average gamma E (MeV) = 1.7089
Average beta E (MeV) = 1.1952
Average alpha E (MeV) = 6.85489E-08

Composite Exposure Rate Conversion Factor = 30.3694496 R/hr per Ci/m2
Composite ECF per FGR table = 29.7267036 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.3616371 Rem/hr per Ci/m2

Ground Source

Point in time = 19.1409130 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	7.3483E+19	1.0233E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	1.6209E+17	1.6264E+05	0.2370	0.0000	0.0000
Co-60m	10.470 m	0.38	3.2056E+18	9.5594E+04	0.0066	0.0536	0.0000
Sc-46m	18.700 s	0.37	9.5378E+16	9.5550E+04	0.0883	0.0523	0.0000
Si-31	2.6200 h	0.38	1.9493E+19	3.8716E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7585E+19	3.5441E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.7695E+17	2.3090E+04	1.4450	1.0680	0.0000
Rb-86m	1.0170 m	0.33	4.7068E+16	1.4450E+04	0.5462	0.0099	0.0000
Na-24	14.960 h	0.01	4.1091E+19	1.4294E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5485E+19	6520.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.5665E+17	4993.	0.0369	0.4043	0.0000
Se-77m	17.360 s	0.29	3.4418E+15	3714.	0.0888	0.0000	0.0000
Mg-27	9.4580 m	0.13	1.1097E+17	3664.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	5.7033E+16	3492.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	2.0219E+17	2690.	0.0521	0.3947	0.0000
Ag-110	24.560 s	0.45	3.0029E+15	2291.	0.0340	1.1780	0.0000
Ti-51	5.8000 m	0.52	3.8398E+16	2067.	0.3692	0.8684	0.0000
F-20	11.030 s	0.27	1.1169E+15	1897.	1.6340	2.4810	0.0000
Ga-70	21.130 m	0.14	1.0440E+17	1543.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.9248E+17	1295.	0.0842	0.0000	0.0000
Nb-94m	6.2600 m	0.16	2.4393E+16	1217.	0.0117	0.0349	0.0000
Ca-49	8.7200 m	0.23	3.3480E+16	1199.	3.1700	0.8697	0.0000
Cl-38	37.200 m	0.27	1.3917E+17	1168.	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.2953E+17	947.6	0.0268	0.1090	0.0000
Ne-23	37.200 s	0.54	1.7542E+15	883.4	0.1653	1.8960	0.0000
Ba-137m	2.5520 m	0.04	6.9490E+15	850.2	0.5990	0.0652	0.0000
O-19	26.910 s	0.30	1.1483E+15	799.4	0.9398	1.7770	0.0000
Eu-152m	9.2750 h	0.10	1.0906E+18	611.9	0.3070	0.5070	0.0000
Ba-139	1.3840 h	0.34	9.1586E+16	344.4	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	6.0032E+15	285.7	1.3790	0.9765	0.0000
N-16	7.1300 s	0.28	1.0823E+14	284.4	4.6030	2.6930	0.0000
Ag-108	2.4000 m	0.83	2.0775E+15	270.3	0.0195	0.6080	0.0011
Sb-124m	1.5500 m	5.38	1.1315E+15	227.9	0.4400	0.1120	0.0000
Rb-88	17.800 m	0.56	1.1022E+16	193.3	0.6370	2.0700	0.0000
Sb-122m	4.1900 m	2.15	2.3819E+15	177.5	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0641E+17	125.6	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0933E+16	115.9	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8860E+16	84.08	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.7487E+15	66.49	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.8141E+15	60.18	0.0766	0.1090	0.0000
Hf-178m	4.0000 s	7.50	1.1197E+13	52.44	1.0026	0.1430	0.0000
Ga-72	14.100 h	0.07	1.3396E+17	49.44	2.7080	0.5028	0.0000
Cr-55	3.5400 m	0.85	4.4116E+14	38.91	0.0033	1.1010	0.0000
Y-90m	3.1890 h	0.31	1.8988E+16	30.98	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.4052E+16	26.09	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8618E+17	24.06	2.3200	0.5340	0.0000
Br-82m	6.0900 m	1.15	3.8188E+14	19.58	0.0028	0.0306	0.0000
Sm-153	1.9280 d	0.01	1.5639E+17	17.59	0.0617	0.2700	0.0000
Xe-135m	15.290 m	0.33	7.6151E+14	15.55	0.4320	0.0984	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 657
Total activity (Ci) = 1.07578E+07

Total number of decays = 9.31135E+18
Asympt number of decays = 6.86756E+20
Percent of decays = 1.3558
Average chain length = 1.0247

Average gamma E (MeV) = 1.7135
Average beta E (MeV) = 1.1986
Average alpha E (MeV) = 3.48460E-09

Composite Exposure Rate Conversion Factor = 30.4510975 R/hr per Ci/m2
Composite ECF per FGR table = 29.7842579 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.4181862 Rem/hr per Ci/m2

Ground Source

Point in time = 23.9051113 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	7.1701E+19	9.9853E+06	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.3581E+17	1.3628E+05	0.2370	0.0000	0.0000
Co-60m	10.470	m	0.38	3.1888E+18	9.5093E+04	0.0066	0.0536	0.0000
Sc-46m	18.700	s	0.37	7.9939E+16	8.0083E+04	0.0883	0.0523	0.0000
Si-31	2.6200	h	0.38	1.9486E+19	3.8702E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7579E+19	3.5428E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.7291E+17	2.2753E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1089E+19	1.4293E+04	4.1240	0.5546	0.0000
Rb-86m	1.0170	m	0.33	4.4589E+16	1.3689E+04	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5484E+19	6519.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.5577E+17	4981.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.1033E+17	3642.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.6421E+16	3454.	0.0978	1.0670	0.0000
Se-77m	17.360	s	0.29	2.8456E+15	3071.	0.0888	0.0000	0.0000
U-239	23.470	m	0.21	2.0171E+17	2683.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.8035E+16	2048.	0.3692	0.8684	0.0000
Ag-110	24.560	s	0.45	2.6251E+15	2002.	0.0340	1.1780	0.0000
Ga-70	21.130	m	0.14	1.0413E+17	1539.	0.0087	0.6440	0.0000
F-20	11.030	s	0.27	8.2796E+14	1406.	1.6340	2.4810	0.0000
Eu-154m	46.400	m	1.08	1.9225E+17	1294.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.4179E+16	1206.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.3269E+16	1191.	3.1700	0.8697	0.0000
Cl-38	37.200	m	0.27	1.3897E+17	1166.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.2936E+17	947.3	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	6.8008E+15	832.1	0.5990	0.0652	0.0000
Ne-23	37.200	s	0.54	1.6052E+15	808.4	0.1653	1.8960	0.0000
O-19	26.910	s	0.30	1.0156E+15	707.1	0.9398	1.7770	0.0000
Eu-152m	9.2750	h	0.10	1.0905E+18	611.8	0.3070	0.5070	0.0000
Ba-139	1.3840	h	0.34	9.1525E+16	344.1	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	5.9530E+15	283.3	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	2.0304E+15	264.1	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.0920E+15	220.0	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.0988E+16	192.7	0.6370	2.0700	0.0000
N-16	7.1300	s	0.28	6.8109E+13	179.0	4.6030	2.6930	0.0000
Sb-122m	4.1900	m	2.15	2.3508E+15	175.2	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0639E+17	125.5	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0914E+16	115.8	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8846E+16	84.06	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7370E+15	66.32	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.8035E+15	59.95	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3396E+17	49.44	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	4.3436E+14	38.31	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8983E+16	30.98	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4047E+16	26.08	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8618E+17	24.06	2.3200	0.5340	0.0000
Hf-178m	4.0000	s	7.50	4.9050E+12	22.97	1.0026	0.1430	0.0000
Br-82m	6.0900	m	1.15	3.7844E+14	19.40	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5638E+17	17.59	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	7.5877E+14	15.49	0.4320	0.0984	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 659
Total activity (Ci) = 1.04643E+07

Total number of decays = 1.11816E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 1.6282
Average chain length = 1.0247

Average gamma E (MeV) = 1.7184
Average beta E (MeV) = 1.2023
Average alpha E (MeV) = 4.01087E-10

Composite Exposure Rate Conversion Factor = 30.5395412 R/hr per Ci/m2
Composite ECF per FGR table = 29.8460236 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.4795036 Rem/hr per Ci/m2

Ground Source

Point in time = 29.8551559 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	6.9536E+19	9.6838E+06	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.0889E+17	1.0927E+05	0.2370	0.0000	0.0000
Co-60m	10.470	m	0.38	3.1679E+18	9.4471E+04	0.0066	0.0536	0.0000
Sc-46m	18.700	s	0.37	6.4117E+16	6.4233E+04	0.0883	0.0523	0.0000
Si-31	2.6200	h	0.38	1.9477E+19	3.8685E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7571E+19	3.5413E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.6795E+17	2.2340E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1086E+19	1.4292E+04	4.1240	0.5546	0.0000
Rb-86m	1.0170	m	0.33	4.1675E+16	1.2794E+04	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5483E+19	6519.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.5467E+17	4966.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0953E+17	3616.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.5665E+16	3408.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0112E+17	2676.	0.0521	0.3947	0.0000
Se-77m	17.360	s	0.29	2.2439E+15	2421.	0.0888	0.0000	0.0000
Ti-51	5.8000	m	0.52	3.7587E+16	2023.	0.3692	0.8684	0.0000
Ag-110	24.560	s	0.45	2.2193E+15	1693.	0.0340	1.1780	0.0000
Ga-70	21.130	m	0.14	1.0379E+17	1534.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9197E+17	1292.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.3915E+16	1193.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.3008E+16	1182.	3.1700	0.8697	0.0000
Cl-38	37.200	m	0.27	1.3871E+17	1164.	1.5110	1.5200	0.0000
F-20	11.030	s	0.27	5.6967E+14	967.5	1.6340	2.4810	0.0000
Cs-134m	2.9080	h	0.10	5.2915E+17	946.9	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	6.6200E+15	809.9	0.5990	0.0652	0.0000
Ne-23	37.200	s	0.54	1.4368E+15	723.5	0.1653	1.8960	0.0000
Eu-152m	9.2750	h	0.10	1.0903E+18	611.7	0.3070	0.5070	0.0000
O-19	26.910	s	0.30	8.7133E+14	606.6	0.9398	1.7770	0.0000
Ba-139	1.3840	h	0.34	9.1449E+16	343.8	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	5.8910E+15	280.4	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	1.9731E+15	256.7	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	1.0447E+15	210.4	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.0946E+16	192.0	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.3126E+15	172.3	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0636E+17	125.5	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0891E+16	115.6	0.0003	0.3216	0.0000
N-16	7.1300	s	0.28	3.8194E+13	100.4	4.6030	2.6930	0.0000
Hf-180m	5.5000	h	1.82	8.8827E+16	84.04	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7224E+15	66.12	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.7903E+15	59.67	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3395E+17	49.43	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	4.2601E+14	37.57	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8976E+16	30.96	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4041E+16	26.07	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8617E+17	24.06	2.3200	0.5340	0.0000
Br-82m	6.0900	m	1.15	3.7420E+14	19.18	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5638E+17	17.59	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	7.5537E+14	15.42	0.4320	0.0984	0.0000
Mn-57	1.4230	m	2.11	5.9438E+13	13.04	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155355D+20

Total number of nuclides = 658
Total activity (Ci) = 1.01161E+07

Total number of decays = 1.34467E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 1.9580
Average chain length = 1.0247

Average gamma E (MeV) = 1.7235
Average beta E (MeV) = 1.2062
Average alpha E (MeV) = 1.98847E-10

Composite Exposure Rate Conversion Factor = 30.6315403 R/hr per Ci/m2
Composite ECF per FGR table = 29.9094658 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.5433445 Rem/hr per Ci/m2

Ground Source

Point in time = 37.2861481 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	6.6924E+19	9.3201E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	3.1420E+18	9.3699E+04	0.0066	0.0536	0.0000
Hf-179m	18.670	s	0.21	8.2640E+16	8.2922E+04	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	4.8680E+16	4.8768E+04	0.0883	0.0523	0.0000
Si-31	2.6200	h	0.38	1.9467E+19	3.8664E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7561E+19	3.5393E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.6188E+17	2.1833E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1082E+19	1.4290E+04	4.1240	0.5546	0.0000
Rb-86m	1.0170	m	0.33	3.8301E+16	1.1759E+04	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5481E+19	6518.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.5331E+17	4947.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0854E+17	3583.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.4736E+16	3351.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	2.0039E+17	2666.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.7035E+16	1994.	0.3692	0.8684	0.0000
Se-77m	17.360	s	0.29	1.6678E+15	1800.	0.0888	0.0000	0.0000
Ga-70	21.130	m	0.14	1.0337E+17	1527.	0.0087	0.6440	0.0000
Ag-110	24.560	s	0.45	1.7994E+15	1373.	0.0340	1.1780	0.0000
Eu-154m	46.400	m	1.08	1.9161E+17	1289.	0.0842	0.0000	0.0000
Nb-94m	6.2600	m	0.16	2.3590E+16	1177.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.2685E+16	1170.	3.1700	0.8697	0.0000
Cl-38	37.200	m	0.27	1.3839E+17	1162.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.2889E+17	946.4	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	6.4010E+15	783.1	0.5990	0.0652	0.0000
Ne-23	37.200	s	0.54	1.2510E+15	630.0	0.1653	1.8960	0.0000
Eu-152m	9.2750	h	0.10	1.0902E+18	611.6	0.3070	0.5070	0.0000
F-20	11.030	s	0.27	3.5712E+14	606.5	1.6340	2.4810	0.0000
O-19	26.910	s	0.30	7.1954E+14	500.9	0.9398	1.7770	0.0000
Ba-139	1.3840	h	0.34	9.1355E+16	343.5	0.0454	0.8990	0.0000
Al-29	6.5600	m	0.91	5.8144E+15	276.7	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	1.9037E+15	247.7	0.0195	0.6080	0.0011
Sb-124m	1.5500	m	5.38	9.8837E+14	199.1	0.4400	0.1120	0.0000
Rb-88	17.800	m	0.56	1.0893E+16	191.1	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.2657E+15	168.8	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0633E+17	125.5	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0861E+16	115.5	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8804E+16	84.02	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.7042E+15	65.87	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.7739E+15	59.32	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3393E+17	49.43	2.7080	0.5028	0.0000
N-16	7.1300	s	0.28	1.8546E+13	48.73	4.6030	2.6930	0.0000
Cr-55	3.5400	m	0.85	4.1580E+14	36.67	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8967E+16	30.95	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4034E+16	26.05	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8617E+17	24.06	2.3200	0.5340	0.0000
Br-82m	6.0900	m	1.15	3.6896E+14	18.92	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5638E+17	17.59	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	7.5114E+14	15.34	0.4320	0.0984	0.0000
Mn-57	1.4230	m	2.11	5.5958E+13	12.28	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155356D+20

Total number of nuclides = 657
Total activity (Ci) = 9.70631E+06

Total number of decays = 1.61711E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 2.3547
Average chain length = 1.0247

Average gamma E (MeV) = 1.7285
Average beta E (MeV) = 1.2100
Average alpha E (MeV) = 1.00408E-10

Composite Exposure Rate Conversion Factor = 30.7222710 R/hr per Ci/m2
Composite ECF per FGR table = 29.9708900 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.6063976 Rem/hr per Ci/m2

Ground Source

Point in time = 46.5667229 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	6.3799E+19	8.8849E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	3.1100E+18	9.2745E+04	0.0066	0.0536	0.0000
Hf-179m	18.670	s	0.21	5.8554E+16	5.8753E+04	0.2370	0.0000	0.0000
Si-31	2.6200	h	0.38	1.9453E+19	3.8638E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7549E+19	3.5368E+04	1.6910	0.8309	0.0000
Sc-46m	18.700	s	0.37	3.4511E+16	3.4573E+04	0.0883	0.0523	0.0000
V-52	3.7450	m	0.13	2.5449E+17	2.1217E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1077E+19	1.4289E+04	4.1240	0.5546	0.0000
Rb-86m	1.0170	m	0.33	3.4469E+16	1.0582E+04	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5479E+19	6517.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.5161E+17	4923.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0732E+17	3543.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.3597E+16	3281.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	1.9947E+17	2654.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.6357E+16	1957.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0285E+17	1520.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9117E+17	1286.	0.0842	0.0000	0.0000
Se-77m	17.360	s	0.29	1.1514E+15	1242.	0.0888	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3799E+17	1158.	1.5110	1.5200	0.0000
Nb-94m	6.2600	m	0.16	2.3189E+16	1157.	0.0117	0.0349	0.0000
Ca-49	8.7200	m	0.23	3.2285E+16	1156.	3.1700	0.8697	0.0000
Ag-110	24.560	s	0.45	1.3848E+15	1056.	0.0340	1.1780	0.0000
Cs-134m	2.9080	h	0.10	5.2857E+17	945.9	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	6.1377E+15	750.9	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0899E+18	611.5	0.3070	0.5070	0.0000
Ne-23	37.200	s	0.54	1.0523E+15	529.9	0.1653	1.8960	0.0000
O-19	26.910	s	0.30	5.6655E+14	394.4	0.9398	1.7770	0.0000
Ba-139	1.3840	h	0.34	9.1237E+16	343.0	0.0454	0.8990	0.0000
F-20	11.030	s	0.27	1.9931E+14	338.5	1.6340	2.4810	0.0000
Al-29	6.5600	m	0.91	5.7201E+15	272.3	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	1.8206E+15	236.8	0.0195	0.6080	0.0011
Rb-88	17.800	m	0.56	1.0828E+16	189.9	0.6370	2.0700	0.0000
Sb-124m	1.5500	m	5.38	9.2232E+14	185.8	0.4400	0.1120	0.0000
Sb-122m	4.1900	m	2.15	2.2084E+15	164.6	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0628E+17	125.5	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0824E+16	115.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8775E+16	83.99	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.6817E+15	65.55	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.7536E+15	58.89	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3391E+17	49.42	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	4.0339E+14	35.58	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8957E+16	30.93	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4510E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4025E+16	26.04	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8616E+17	24.05	2.3200	0.5340	0.0000
N-16	7.1300	s	0.28	7.5236E+12	19.77	4.6030	2.6930	0.0000
Br-82m	6.0900	m	1.15	3.6252E+14	18.59	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5637E+17	17.59	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	7.4589E+14	15.23	0.4320	0.0984	0.0000
Sc-49	57.200	m	0.35	2.1216E+15	11.58	0.0026	0.8180	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 659
Total activity (Ci) = 9.22826E+06

Total number of decays = 1.94210E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 2.8279
Average chain length = 1.0247

Average gamma E (MeV) = 1.7331
Average beta E (MeV) = 1.2135
Average alpha E (MeV) = 4.28423E-11

Composite Exposure Rate Conversion Factor = 30.8052197 R/hr per Ci/m2
Composite ECF per FGR table = 30.0253849 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.6641407 Rem/hr per Ci/m2

Ground Source

Point in time = 58.1572990 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	6.0100E+19	8.3698E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	3.0705E+18	9.1566E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9437E+19	3.8605E+04	0.0018	0.5952	0.0000
Hf-179m	18.670	s	0.21	3.8078E+16	3.8208E+04	0.2370	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.7534E+19	3.5338E+04	1.6910	0.8309	0.0000
Sc-46m	18.700	s	0.37	2.2458E+16	2.2498E+04	0.0883	0.0523	0.0000
V-52	3.7450	m	0.13	2.4555E+17	2.0472E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1071E+19	1.4286E+04	4.1240	0.5546	0.0000
Rb-86m	1.0170	m	0.33	3.0217E+16	9277.	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5476E+19	6516.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.4951E+17	4894.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0581E+17	3493.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.2209E+16	3196.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	1.9834E+17	2639.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.5527E+16	1912.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0220E+17	1510.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.9062E+17	1283.	0.0842	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3750E+17	1154.	1.5110	1.5200	0.0000
Ca-49	8.7200	m	0.23	3.1794E+16	1138.	3.1700	0.8697	0.0000
Nb-94m	6.2600	m	0.16	2.2698E+16	1132.	0.0117	0.0349	0.0000
Cs-134m	2.9080	h	0.10	5.2816E+17	945.1	0.0268	0.1090	0.0000
Se-77m	17.360	s	0.29	7.2482E+14	782.2	0.0888	0.0000	0.0000
Ag-110	24.560	s	0.45	9.9842E+14	761.6	0.0340	1.1780	0.0000
Ba-137m	2.5520	m	0.04	5.8240E+15	712.5	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0897E+18	611.4	0.3070	0.5070	0.0000
Ne-23	37.200	s	0.54	8.4793E+14	427.0	0.1653	1.8960	0.0000
Ba-139	1.3840	h	0.34	9.1090E+16	342.5	0.0454	0.8990	0.0000
O-19	26.910	s	0.30	4.2032E+14	292.6	0.9398	1.7770	0.0000
Al-29	6.5600	m	0.91	5.6046E+15	266.8	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	1.7218E+15	224.0	0.0195	0.6080	0.0011
Rb-88	17.800	m	0.56	1.0747E+16	188.5	0.6370	2.0700	0.0000
Sb-124m	1.5500	m	5.38	8.4598E+14	170.4	0.4400	0.1120	0.0000
F-20	11.030	s	0.27	9.6206E+13	163.4	1.6340	2.4810	0.0000
Sb-122m	4.1900	m	2.15	2.1390E+15	159.4	0.0704	0.0920	0.0000
Cu-64	12.700	h	0.02	3.0623E+17	125.5	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	2.0778E+16	115.0	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8739E+16	83.96	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.6537E+15	65.16	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.7285E+15	58.35	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3389E+17	49.42	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	3.8842E+14	34.26	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8943E+16	30.91	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4509E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4014E+16	26.02	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8615E+17	24.05	2.3200	0.5340	0.0000
Br-82m	6.0900	m	1.15	3.5464E+14	18.18	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5636E+17	17.58	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	7.3939E+14	15.10	0.4320	0.0984	0.0000
Sc-49	57.200	m	0.35	2.6081E+15	14.24	0.0026	0.8180	0.0000
Mn-57	1.4230	m	2.11	4.7236E+13	10.36	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 657
Total activity (Ci) = 8.67573E+06

Total number of decays = 2.32585E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 3.3867
Average chain length = 1.0247

Average gamma E (MeV) = 1.7369
Average beta E (MeV) = 1.2164
Average alpha E (MeV) = 1.47683E-11

Composite Exposure Rate Conversion Factor = 30.8728065 R/hr per Ci/m2
Composite ECF per FGR table = 30.0671978 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.7113552 Rem/hr per Ci/m2

Ground Source

Point in time = 1.21054566 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	5.5781E+19	7.7682E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	3.0219E+18	9.0115E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9416E+19	3.8564E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7515E+19	3.5300E+04	1.6910	0.8309	0.0000
Hf-179m	18.670	s	0.21	2.2247E+16	2.2323E+04	0.2370	0.0000	0.0000
V-52	3.7450	m	0.13	2.3483E+17	1.9578E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1063E+19	1.4284E+04	4.1240	0.5546	0.0000
Sc-46m	18.700	s	0.37	1.3132E+16	1.3156E+04	0.0883	0.0523	0.0000
Rb-86m	1.0170	m	0.33	2.5635E+16	7870.	0.5462	0.0099	0.0000
K-42	12.360	h	0.02	1.5472E+19	6514.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	3.4690E+17	4857.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0396E+17	3432.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	5.0524E+16	3093.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	1.9693E+17	2620.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.4517E+16	1858.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0139E+17	1498.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.8993E+17	1278.	0.0842	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3688E+17	1149.	1.5110	1.5200	0.0000
Ca-49	8.7200	m	0.23	3.1190E+16	1117.	3.1700	0.8697	0.0000
Nb-94m	6.2600	m	0.16	2.2100E+16	1102.	0.0117	0.0349	0.0000
Cs-134m	2.9080	h	0.10	5.2766E+17	944.2	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	5.4546E+15	667.3	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0894E+18	611.2	0.3070	0.5070	0.0000
Ag-110	24.560	s	0.45	6.6358E+14	506.2	0.0340	1.1780	0.0000
Se-77m	17.360	s	0.29	4.0665E+14	438.8	0.0888	0.0000	0.0000
Ba-139	1.3840	h	0.34	9.0907E+16	341.8	0.0454	0.8990	0.0000
Ne-23	37.200	s	0.54	6.4747E+14	326.1	0.1653	1.8960	0.0000
Al-29	6.5600	m	0.91	5.4635E+15	260.0	1.3790	0.9765	0.0000
Ag-108	2.4000	m	0.83	1.6059E+15	208.9	0.0195	0.6080	0.0011
O-19	26.910	s	0.30	2.8950E+14	201.5	0.9398	1.7770	0.0000
Rb-88	17.800	m	0.56	1.0646E+16	186.7	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	2.0553E+15	153.2	0.0704	0.0920	0.0000
Sb-124m	1.5500	m	5.38	7.5946E+14	153.0	0.4400	0.1120	0.0000
Cu-64	12.700	h	0.02	3.0616E+17	125.4	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.0721E+16	114.7	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8694E+16	83.92	0.9980	0.0000	0.0000
F-20	11.030	s	0.27	3.8738E+13	65.79	1.6340	2.4810	0.0000
Sm-155	22.300	m	0.90	4.6189E+15	64.67	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.6974E+15	57.69	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3387E+17	49.41	2.7080	0.5028	0.0000
Cr-55	3.5400	m	0.85	3.7050E+14	32.68	0.0033	1.1010	0.0000
Y-90m	3.1890	h	0.31	1.8927E+16	30.88	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4509E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.4000E+16	25.99	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8614E+17	24.05	2.3200	0.5340	0.0000
Br-82m	6.0900	m	1.15	3.4503E+14	17.69	0.0028	0.0306	0.0000
Sm-153	1.9280	d	0.01	1.5635E+17	17.58	0.0617	0.2700	0.0000
Sc-49	57.200	m	0.35	3.2035E+15	17.49	0.0026	0.8180	0.0000
Xe-135m	15.290	m	0.33	7.3134E+14	14.93	0.4320	0.0984	0.0000
Mn-57	1.4230	m	2.11	4.1999E+13	9.215	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155344D+20

Total number of nuclides = 657
Total activity (Ci) = 8.04376E+06

Total number of decays = 2.77332E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 4.0383
Average chain length = 1.0247

Average gamma E (MeV) = 1.7394
Average beta E (MeV) = 1.2184
Average alpha E (MeV) = 3.89963E-12

Composite Exposure Rate Conversion Factor = 30.9173756 R/hr per Ci/m2
Composite ECF per FGR table = 30.0903969 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.7427731 Rem/hr per Ci/m2

Ground Source

Point in time = 1.51185203 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	5.0819E+19	7.0772E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	2.9622E+18	8.8336E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.9390E+19	3.8513E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7491E+19	3.5252E+04	1.6910	0.8309	0.0000
V-52	3.7450	m	0.13	2.2209E+17	1.8516E+04	1.4450	1.0680	0.0000
Na-24	14.960	h	0.01	4.1054E+19	1.4280E+04	4.1240	0.5546	0.0000
Hf-179m	18.670	s	0.21	1.1371E+16	1.1409E+04	0.2370	0.0000	0.0000
Sc-46m	18.700	s	0.37	6.7193E+15	6731.	0.0883	0.0523	0.0000
K-42	12.360	h	0.02	1.5468E+19	6512.	0.2786	1.4310	0.0000
Rb-86m	1.0170	m	0.33	2.0876E+16	6409.	0.5462	0.0099	0.0000
Th-233	22.300	m	0.45	3.4366E+17	4812.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	1.0169E+17	3357.	0.8914	0.7010	0.0000
Cu-66	5.1000	m	0.20	4.8497E+16	2969.	0.0978	1.0670	0.0000
U-239	23.470	m	0.21	1.9519E+17	2597.	0.0521	0.3947	0.0000
Ti-51	5.8000	m	0.52	3.3296E+16	1792.	0.3692	0.8684	0.0000
Ga-70	21.130	m	0.14	1.0040E+17	1483.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.8908E+17	1272.	0.0842	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3611E+17	1142.	1.5110	1.5200	0.0000
Ca-49	8.7200	m	0.23	3.0451E+16	1090.	3.1700	0.8697	0.0000
Nb-94m	6.2600	m	0.16	2.1375E+16	1066.	0.0117	0.0349	0.0000
Cs-134m	2.9080	h	0.10	5.2703E+17	943.1	0.0268	0.1090	0.0000
Ba-137m	2.5520	m	0.04	5.0260E+15	614.9	0.5990	0.0652	0.0000
Eu-152m	9.2750	h	0.10	1.0889E+18	611.0	0.3070	0.5070	0.0000
Ba-139	1.3840	h	0.34	9.0678E+16	340.9	0.0454	0.8990	0.0000
Ag-110	24.560	s	0.45	3.9839E+14	303.9	0.0340	1.1780	0.0000
Al-29	6.5600	m	0.91	5.2923E+15	251.9	1.3790	0.9765	0.0000
Ne-23	37.200	s	0.54	4.6230E+14	232.8	0.1653	1.8960	0.0000
Se-77m	17.360	s	0.29	1.9758E+14	213.2	0.0888	0.0000	0.0000
Ag-108	2.4000	m	0.83	1.4721E+15	191.5	0.0195	0.6080	0.0011
Rb-88	17.800	m	0.56	1.0522E+16	184.6	0.6370	2.0700	0.0000
Sb-122m	4.1900	m	2.15	1.9554E+15	145.7	0.0704	0.0920	0.0000
Sb-124m	1.5500	m	5.38	6.6373E+14	133.7	0.4400	0.1120	0.0000
O-19	26.910	s	0.30	1.8172E+14	126.5	0.9398	1.7770	0.0000
Cu-64	12.700	h	0.02	3.0608E+17	125.4	0.1920	0.0734	0.0000
Zn-69	56.400	m	1.60	2.0650E+16	114.3	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.8638E+16	83.86	0.9980	0.0000	0.0000
Sm-155	22.300	m	0.90	4.5758E+15	64.07	0.1040	0.5680	0.0000
Ba-131m	14.600	m	1.37	2.6591E+15	56.87	0.0766	0.1090	0.0000
Ga-72	14.100	h	0.07	1.3383E+17	49.39	2.7080	0.5028	0.0000
Y-90m	3.1890	h	0.31	1.8906E+16	30.85	0.6340	0.0475	0.0000
Cr-55	3.5400	m	0.85	3.4927E+14	30.81	0.0033	1.1010	0.0000
Ar-37	35.030	d	0.09	4.4509E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.3983E+16	25.96	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8612E+17	24.05	2.3200	0.5340	0.0000
Sc-49	57.200	m	0.35	3.9286E+15	21.44	0.0026	0.8180	0.0000
F-20	11.030	s	0.27	1.2438E+13	21.12	1.6340	2.4810	0.0000
Sm-153	1.9280	d	0.01	1.5634E+17	17.58	0.0617	0.2700	0.0000
Br-82m	6.0900	m	1.15	3.3340E+14	17.09	0.0028	0.0306	0.0000
Xe-135m	15.290	m	0.33	7.2142E+14	14.73	0.4320	0.0984	0.0000
Mn-57	1.4230	m	2.11	3.6266E+13	7.957	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 658
Total activity (Ci) = 7.32988E+06

Total number of decays = 3.28707E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 4.7864
Average chain length = 1.0247

Average gamma E (MeV) = 1.7403
Average beta E (MeV) = 1.2192
Average alpha E (MeV) = 7.38121E-13

Composite Exposure Rate Conversion Factor = 30.9323101 R/hr per Ci/m2
Composite ECF per FGR table = 30.0895004 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.7538300 Rem/hr per Ci/m2

Ground Source

Point in time = 1.88815582 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	4.5238E+19	6.3000E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.8893E+18	8.6162E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9358E+19	3.8449E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7462E+19	3.5193E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	2.0715E+17	1.7270E+04	1.4450	1.0680	0.0000
Na-24	14.960 h	0.01	4.1042E+19	1.4276E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5463E+19	6510.	0.2786	1.4310	0.0000
Rb-86m	1.0170 m	0.33	1.6153E+16	4959.	0.5462	0.0099	0.0000
Hf-179m	18.670 s	0.21	4.9174E+15	4934.	0.2370	0.0000	0.0000
Th-233	22.300 m	0.45	3.3967E+17	4756.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	9.8920E+16	3266.	0.8914	0.7010	0.0000
Sc-46m	18.700 s	0.37	2.9098E+15	2915.	0.0883	0.0523	0.0000
Cu-66	5.1000 m	0.20	4.6079E+16	2821.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	1.9303E+17	2568.	0.0521	0.3947	0.0000
Ti-51	5.8000 m	0.52	3.1832E+16	1714.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	9.9164E+16	1465.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.8802E+17	1265.	0.0842	0.0000	0.0000
Cl-38	37.200 m	0.27	1.3516E+17	1134.	1.5110	1.5200	0.0000
Ca-49	8.7200 m	0.23	2.9554E+16	1058.	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	2.0503E+16	1023.	0.0117	0.0349	0.0000
Cs-134m	2.9080 h	0.10	5.2624E+17	941.7	0.0268	0.1090	0.0000
Eu-152m	9.2750 h	0.10	1.0884E+18	610.7	0.3070	0.5070	0.0000
Ba-137m	2.5520 m	0.04	4.5376E+15	555.2	0.5990	0.0652	0.0000
Ba-139	1.3840 h	0.34	9.0394E+16	339.9	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	5.0860E+15	242.1	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	1.0369E+16	181.9	0.6370	2.0700	0.0000
Ag-108	2.4000 m	0.83	1.3205E+15	171.8	0.0195	0.6080	0.0011
Ag-110	24.560 s	0.45	2.1065E+14	160.7	0.0340	1.1780	0.0000
Ne-23	37.200 s	0.54	3.0354E+14	152.9	0.1653	1.8960	0.0000
Sb-122m	4.1900 m	2.15	1.8374E+15	136.9	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0597E+17	125.4	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0561E+16	113.8	0.0003	0.3216	0.0000
Sb-124m	1.5500 m	5.38	5.6093E+14	113.0	0.4400	0.1120	0.0000
Se-77m	17.360 s	0.29	8.0208E+13	86.55	0.0888	0.0000	0.0000
Hf-180m	5.5000 h	1.82	8.8568E+16	83.80	0.9980	0.0000	0.0000
O-19	26.910 s	0.30	1.0159E+14	70.72	0.9398	1.7770	0.0000
Sm-155	22.300 m	0.90	4.5226E+15	63.32	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.6120E+15	55.86	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3379E+17	49.38	2.7080	0.5028	0.0000
Y-90m	3.1890 h	0.31	1.8880E+16	30.81	0.6340	0.0475	0.0000
Cr-55	3.5400 m	0.85	3.2446E+14	28.62	0.0033	1.1010	0.0000
Ar-37	35.030 d	0.09	4.4509E+18	27.55	0.0002	0.0019	0.0000
Sc-49	57.200 m	0.35	4.8061E+15	26.23	0.0026	0.8180	0.0000
Sr-87m	2.8030 h	0.11	1.3961E+16	25.92	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8610E+17	24.05	2.3200	0.5340	0.0000
Sm-153	1.9280 d	0.01	1.5633E+17	17.58	0.0617	0.2700	0.0000
Br-82m	6.0900 m	1.15	3.1942E+14	16.38	0.0028	0.0306	0.0000
Xe-135m	15.290 m	0.33	7.0922E+14	14.48	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0977E+16	7.933	0.4161	0.0226	0.0000
Mn-57	1.4230 m	2.11	3.0192E+13	6.625	0.0976	1.0900	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155340D+20

Total number of nuclides = 657
Total activity (Ci) = 6.53626E+06

Total number of decays = 3.86556E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 5.6287
Average chain length = 1.0247

Average gamma E (MeV) = 1.7393
Average beta E (MeV) = 1.2185
Average alpha E (MeV) = 9.22243E-14

Composite Exposure Rate Conversion Factor = 30.9125767 R/hr per Ci/m2
Composite ECF per FGR table = 30.0596905 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.7411537 Rem/hr per Ci/m2

Ground Source

Point in time = 2.35812044 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	3.9120E+19	5.4480E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.8008E+18	8.3523E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9318E+19	3.8369E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7425E+19	3.5119E+04	1.6910	0.8309	0.0000
V-52	3.7450 m	0.13	1.8989E+17	1.5832E+04	1.4450	1.0680	0.0000
Na-24	14.960 h	0.01	4.1027E+19	1.4271E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5456E+19	6507.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.3474E+17	4687.	0.0369	0.4043	0.0000
Rb-86m	1.0170 m	0.33	1.1726E+16	3600.	0.5462	0.0099	0.0000
Mg-27	9.4580 m	0.13	9.5571E+16	3155.	0.8914	0.7010	0.0000
Cu-66	5.1000 m	0.20	4.3228E+16	2646.	0.0978	1.0670	0.0000
U-239	23.470 m	0.21	1.9037E+17	2533.	0.0521	0.3947	0.0000
Hf-179m	18.670 s	0.21	1.7262E+15	1732.	0.2370	0.0000	0.0000
Ti-51	5.8000 m	0.52	3.0094E+16	1620.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	9.7647E+16	1443.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.8671E+17	1256.	0.0842	0.0000	0.0000
Cl-38	37.200 m	0.27	1.3398E+17	1125.	1.5110	1.5200	0.0000
Sc-46m	18.700 s	0.37	1.0231E+15	1025.	0.0883	0.0523	0.0000
Ca-49	8.7200 m	0.23	2.8470E+16	1019.	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	1.9463E+16	970.7	0.0117	0.0349	0.0000
Cs-134m	2.9080 h	0.10	5.2526E+17	939.9	0.0268	0.1090	0.0000
Eu-152m	9.2750 h	0.10	1.0878E+18	610.3	0.3070	0.5070	0.0000
Ba-137m	2.5520 m	0.04	3.9939E+15	488.6	0.5990	0.0652	0.0000
Ba-139	1.3840 h	0.34	9.0040E+16	338.5	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	4.8396E+15	230.3	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	1.0181E+16	178.6	0.6370	2.0700	0.0000
Ag-108	2.4000 m	0.83	1.1529E+15	150.0	0.0195	0.6080	0.0011
Sb-122m	4.1900 m	2.15	1.6999E+15	126.7	0.0704	0.0920	0.0000
Cu-64	12.700 h	0.02	3.0584E+17	125.3	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0451E+16	113.2	0.0003	0.3216	0.0000
Sb-124m	1.5500 m	5.38	4.5460E+14	91.57	0.4400	0.1120	0.0000
Ne-23	37.200 s	0.54	1.7949E+14	90.39	0.1653	1.8960	0.0000
Hf-180m	5.5000 h	1.82	8.8481E+16	83.72	0.9980	0.0000	0.0000
Ag-110	24.560 s	0.45	9.5049E+13	72.50	0.0340	1.1780	0.0000
Sm-155	22.300 m	0.90	4.4570E+15	62.40	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.5544E+15	54.63	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3374E+17	49.36	2.7080	0.5028	0.0000
O-19	26.910 s	0.30	4.9137E+13	34.21	0.9398	1.7770	0.0000
Sc-49	57.200 m	0.35	5.8594E+15	31.98	0.0026	0.8180	0.0000
Y-90m	3.1890 h	0.31	1.8848E+16	30.76	0.6340	0.0475	0.0000
Se-77m	17.360 s	0.29	2.6017E+13	28.08	0.0888	0.0000	0.0000
Ar-37	35.030 d	0.09	4.4509E+18	27.55	0.0002	0.0019	0.0000
Cr-55	3.5400 m	0.85	2.9594E+14	26.10	0.0033	1.1010	0.0000
Sr-87m	2.8030 h	0.11	1.3934E+16	25.87	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8607E+17	24.04	2.3200	0.5340	0.0000
Sm-153	1.9280 d	0.01	1.5631E+17	17.58	0.0617	0.2700	0.0000
Br-82m	6.0900 m	1.15	3.0278E+14	15.52	0.0028	0.0306	0.0000
Xe-135m	15.290 m	0.33	6.9427E+14	14.18	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0968E+16	7.930	0.4161	0.0226	0.0000
As-76	1.0930 d	0.34	3.2007E+16	6.349	0.4300	1.0610	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 657
Total activity (Ci) = 5.67259E+06

Total number of decays = 4.50132E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 6.5545
Average chain length = 1.0247

Average gamma E (MeV) = 1.7362
Average beta E (MeV) = 1.2162
Average alpha E (MeV) = 6.93122E-15

Composite Exposure Rate Conversion Factor = 30.8538685 R/hr per Ci/m2
Composite ECF per FGR table = 29.9959507 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.7018871 Rem/hr per Ci/m2

Ground Source

Point in time = 2.94506025 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	3.2628E+19	4.5439E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.6940E+18	8.0339E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9268E+19	3.8270E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7379E+19	3.5027E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.1008E+19	1.4265E+04	4.1240	0.5546	0.0000
V-52	3.7450 m	0.13	1.7034E+17	1.4202E+04	1.4450	1.0680	0.0000
K-42	12.360 h	0.02	1.5447E+19	6504.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.2869E+17	4602.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	9.1547E+16	3022.	0.8914	0.7010	0.0000
U-239	23.470 m	0.21	1.8710E+17	2489.	0.0521	0.3947	0.0000
Cu-66	5.1000 m	0.20	3.9914E+16	2444.	0.0978	1.0670	0.0000
Rb-86m	1.0170 m	0.33	7.8600E+15	2413.	0.5462	0.0099	0.0000
Ti-51	5.8000 m	0.52	2.8055E+16	1510.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	9.5785E+16	1415.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.8508E+17	1245.	0.0842	0.0000	0.0000
Cl-38	37.200 m	0.27	1.3253E+17	1112.	1.5110	1.5200	0.0000
Ca-49	8.7200 m	0.23	2.7173E+16	972.9	3.1700	0.8697	0.0000
Cs-134m	2.9080 h	0.10	5.2403E+17	937.7	0.0268	0.1090	0.0000
Nb-94m	6.2600 m	0.16	1.8238E+16	909.7	0.0117	0.0349	0.0000
Eu-152m	9.2750 h	0.10	1.0870E+18	609.9	0.3070	0.5070	0.0000
Hf-179m	18.670 s	0.21	4.6694E+14	468.5	0.2370	0.0000	0.0000
Ba-137m	2.5520 m	0.04	3.4053E+15	416.6	0.5990	0.0652	0.0000
Ba-139	1.3840 h	0.34	8.9600E+16	336.9	0.0454	0.8990	0.0000
Sc-46m	18.700 s	0.37	2.7735E+14	277.8	0.0883	0.0523	0.0000
Al-29	6.5600 m	0.91	4.5486E+15	216.5	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	9.9508E+15	174.5	0.6370	2.0700	0.0000
Ag-108	2.4000 m	0.83	9.7310E+14	126.6	0.0195	0.6080	0.0011
Cu-64	12.700 h	0.02	3.0568E+17	125.3	0.1920	0.0734	0.0490
Sb-122m	4.1900 m	2.15	1.5426E+15	115.0	0.0704	0.0920	0.0000
Zn-69	56.400 m	1.60	2.0314E+16	112.5	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.8372E+16	83.61	0.9980	0.0000	0.0000
Sb-124m	1.5500 m	5.38	3.4966E+14	70.43	0.4400	0.1120	0.0000
Sm-155	22.300 m	0.90	4.3765E+15	61.28	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	2.4842E+15	53.13	0.0766	0.1090	0.0000
Ga-72	14.100 h	0.07	1.3368E+17	49.34	2.7080	0.5028	0.0000
Ne-23	37.200 s	0.54	9.3124E+13	46.90	0.1653	1.8960	0.0000
Sc-49	57.200 m	0.35	7.1110E+15	38.82	0.0026	0.8180	0.0000
Y-90m	3.1890 h	0.31	1.8808E+16	30.69	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4508E+18	27.55	0.0002	0.0019	0.0000
Ag-110	24.560 s	0.45	3.5181E+13	26.83	0.0340	1.1780	0.0000
Sr-87m	2.8030 h	0.11	1.3900E+16	25.81	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8604E+17	24.04	2.3200	0.5340	0.0000
Cr-55	3.5400 m	0.85	2.6381E+14	23.27	0.0033	1.1010	0.0000
Sm-153	1.9280 d	0.01	1.5629E+17	17.58	0.0617	0.2700	0.0000
Br-82m	6.0900 m	1.15	2.8322E+14	14.52	0.0028	0.0306	0.0000
O-19	26.910 s	0.30	1.9836E+13	13.81	0.9398	1.7770	0.0000
Xe-135m	15.290 m	0.33	6.7604E+14	13.81	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0958E+16	7.926	0.4161	0.0226	0.0000
Se-77m	17.360 s	0.29	6.3765E+12	6.881	0.0888	0.0000	0.0000
As-76	1.0930 d	0.34	3.1998E+16	6.348	0.4300	1.0610	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 658
Total activity (Ci) = 4.75927E+06

Total number of decays = 5.17914E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 7.5415
Average chain length = 1.0247

Average gamma E (MeV) = 1.7305
Average beta E (MeV) = 1.2122
Average alpha E (MeV) = 4.13485E-16

Composite Exposure Rate Conversion Factor = 30.7494469 R/hr per Ci/m2
Composite ECF per FGR table = 29.8903370 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.6316414 Rem/hr per Ci/m2

Ground Source

Point in time = 3.67809343 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	2.6012E+19	3.6225E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.5664E+18	7.6534E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9206E+19	3.8147E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7323E+19	3.4912E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0985E+19	1.4257E+04	4.1240	0.5546	0.0000
V-52	3.7450 m	0.13	1.4873E+17	1.2400E+04	1.4450	1.0680	0.0000
K-42	12.360 h	0.02	1.5437E+19	6499.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.2129E+17	4498.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	8.6758E+16	2864.	0.8914	0.7010	0.0000
U-239	23.470 m	0.21	1.8309E+17	2436.	0.0521	0.3947	0.0000
Cu-66	5.1000 m	0.20	3.6129E+16	2212.	0.0978	1.0670	0.0000
Rb-86m	1.0170 m	0.33	4.7692E+15	1464.	0.5462	0.0099	0.0000
Ti-51	5.8000 m	0.52	2.5702E+16	1384.	0.3692	0.8684	0.0000
Ga-70	21.130 m	0.14	9.3509E+16	1382.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.8306E+17	1232.	0.0842	0.0000	0.0000
Cl-38	37.200 m	0.27	1.3073E+17	1097.	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.2251E+17	935.0	0.0268	0.1090	0.0000
Ca-49	8.7200 m	0.23	2.5635E+16	917.9	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	1.6816E+16	838.7	0.0117	0.0349	0.0000
Eu-152m	9.2750 h	0.10	1.0860E+18	609.3	0.3070	0.5070	0.0000
Ba-137m	2.5520 m	0.04	2.7906E+15	341.4	0.5990	0.0652	0.0000
Ba-139	1.3840 h	0.34	8.9054E+16	334.8	0.0454	0.8990	0.0000
Al-29	6.5600 m	0.91	4.2096E+15	200.4	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	9.6708E+15	169.6	0.6370	2.0700	0.0000
Cu-64	12.700 h	0.02	3.0548E+17	125.2	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	2.0145E+16	111.5	0.0003	0.3216	0.0000
Ag-108	2.4000 m	0.83	7.8743E+14	102.4	0.0195	0.6080	0.0011
Sb-122m	4.1900 m	2.15	1.3665E+15	101.8	0.0704	0.0920	0.0000
Hf-179m	18.670 s	0.21	9.1224E+13	91.53	0.2370	0.0000	0.0000
Hf-180m	5.5000 h	1.82	8.8236E+16	83.48	0.9980	0.0000	0.0000
Sm-155	22.300 m	0.90	4.2779E+15	59.90	0.1040	0.5680	0.0000
Sc-46m	18.700 s	0.37	5.4326E+13	54.42	0.0883	0.0523	0.0000
Ba-131m	14.600 m	1.37	2.3992E+15	51.31	0.0766	0.1090	0.0000
Sb-124m	1.5500 m	5.38	2.5193E+14	50.75	0.4400	0.1120	0.0000
Ga-72	14.100 h	0.07	1.3360E+17	49.31	2.7080	0.5028	0.0000
Sc-49	57.200 m	0.35	8.5793E+15	46.83	0.0026	0.8180	0.0000
Y-90m	3.1890 h	0.31	1.8758E+16	30.61	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4508E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3858E+16	25.73	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8600E+17	24.03	2.3200	0.5340	0.0000
Ne-23	37.200 s	0.54	4.1034E+13	20.66	0.1653	1.8960	0.0000
Cr-55	3.5400 m	0.85	2.2854E+14	20.16	0.0033	1.1010	0.0000
Sm-153	1.9280 d	0.01	1.5626E+17	17.57	0.0617	0.2700	0.0000
Br-82m	6.0900 m	1.15	2.6055E+14	13.36	0.0028	0.0306	0.0000
Xe-135m	15.290 m	0.33	6.5394E+14	13.35	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0945E+16	7.921	0.4161	0.0226	0.0000
Ag-110	24.560 s	0.45	1.0168E+13	7.756	0.0340	1.1780	0.0000
As-76	1.0930 d	0.34	3.1988E+16	6.346	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	2.0595E+15	5.866	1.2840	0.4639	0.0000
Se-81	18.450 m	0.65	2.6517E+14	4.487	0.0080	0.6107	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 656
Total activity (Ci) = 3.82934E+06

Total number of decays = 5.87511E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 8.5549
Average chain length = 1.0247

Average gamma E (MeV) = 1.7217
Average beta E (MeV) = 1.2057
Average alpha E (MeV) = 2.83366E-16

Composite Exposure Rate Conversion Factor = 30.5847778 R/hr per Ci/m2
Composite ECF per FGR table = 29.7274418 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.5207920 Rem/hr per Ci/m2

Ground Source

Point in time = 4.59357548 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	1.9600E+19	2.7295E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.4155E+18	7.2033E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9129E+19	3.7993E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7252E+19	3.4770E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0956E+19	1.4246E+04	4.1240	0.5546	0.0000
V-52	3.7450 m	0.13	1.2555E+17	1.0467E+04	1.4450	1.0680	0.0000
K-42	12.360 h	0.02	1.5424E+19	6494.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.1227E+17	4372.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	8.1129E+16	2678.	0.8914	0.7010	0.0000
U-239	23.470 m	0.21	1.7821E+17	2371.	0.0521	0.3947	0.0000
Cu-66	5.1000 m	0.20	3.1902E+16	1953.	0.0978	1.0670	0.0000
Ga-70	21.130 m	0.14	9.0742E+16	1341.	0.0087	0.6440	0.0000
Ti-51	5.8000 m	0.52	2.3038E+16	1240.	0.3692	0.8684	0.0000
Eu-154m	46.400 m	1.08	1.8057E+17	1215.	0.0842	0.0000	0.0000
Cl-38	37.200 m	0.27	1.2852E+17	1079.	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.2061E+17	931.6	0.0268	0.1090	0.0000
Ca-49	8.7200 m	0.23	2.3835E+16	853.4	3.1700	0.8697	0.0000
Rb-86m	1.0170 m	0.33	2.5554E+15	784.5	0.5462	0.0099	0.0000
Nb-94m	6.2600 m	0.16	1.5195E+16	757.9	0.0117	0.0349	0.0000
Eu-152m	9.2750 h	0.10	1.0848E+18	608.6	0.3070	0.5070	0.0000
Ba-139	1.3840 h	0.34	8.8376E+16	332.3	0.0454	0.8990	0.0000
Ba-137m	2.5520 m	0.04	2.1762E+15	266.3	0.5990	0.0652	0.0000
Al-29	6.5600 m	0.91	3.8215E+15	181.9	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	9.3321E+15	163.7	0.6370	2.0700	0.0000
Cu-64	12.700 h	0.02	3.0522E+17	125.1	0.1920	0.0734	0.0490
Zn-69	56.400 m	1.60	1.9935E+16	110.4	0.0003	0.3216	0.0000
Sb-122m	4.1900 m	2.15	1.1744E+15	87.51	0.0704	0.0920	0.0000
Hf-180m	5.5000 h	1.82	8.8066E+16	83.32	0.9980	0.0000	0.0000
Ag-108	2.4000 m	0.83	6.0448E+14	78.64	0.0195	0.6080	0.0011
Sm-155	22.300 m	0.90	4.1579E+15	58.22	0.1040	0.5680	0.0000
Sc-49	57.200 m	0.35	1.0274E+16	56.08	0.0026	0.8180	0.0000
Ga-72	14.100 h	0.07	1.3350E+17	49.27	2.7080	0.5028	0.0000
Ba-131m	14.600 m	1.37	2.2972E+15	49.13	0.0766	0.1090	0.0000
Sb-124m	1.5500 m	5.38	1.6729E+14	33.70	0.4400	0.1120	0.0000
Y-90m	3.1890 h	0.31	1.8696E+16	30.51	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4507E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3806E+16	25.63	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8595E+17	24.03	2.3200	0.5340	0.0000
Sm-153	1.9280 d	0.01	1.5622E+17	17.57	0.0617	0.2700	0.0000
Cr-55	3.5400 m	0.85	1.9103E+14	16.85	0.0033	1.1010	0.0000
Xe-135m	15.290 m	0.33	6.2736E+14	12.81	0.4320	0.0984	0.0000
Br-82m	6.0900 m	1.15	2.3477E+14	12.04	0.0028	0.0306	0.0000
Hf-179m	18.670 s	0.21	1.1870E+13	11.91	0.2370	0.0000	0.0000
Zn-69m	13.760 h	0.15	2.0929E+16	7.915	0.4161	0.0226	0.0000
Ne-23	37.200 s	0.54	1.4745E+13	7.426	0.1653	1.8960	0.0000
Sc-46m	18.700 s	0.37	7.0921E+12	7.105	0.0883	0.0523	0.0000
As-76	1.0930 d	0.34	3.1975E+16	6.343	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	2.0477E+15	5.832	1.2840	0.4639	0.0000
Se-81	18.450 m	0.65	2.5922E+14	4.387	0.0080	0.6107	0.0000
Se-79m	3.9000 m	0.51	4.0869E+13	3.272	0.0139	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155336D+20
Difference in atom count = 1.44E+06
Fractional difference = 2.15E-15

Total number of nuclides = 653
Total activity (Ci) = 2.92764E+06

Total number of decays = 6.55744E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 9.5484
Average chain length = 1.0247

Average gamma E (MeV) = 1.7079
Average beta E (MeV) = 1.1955
Average alpha E (MeV) = 5.57319E-16

Composite Exposure Rate Conversion Factor = 30.3292198 R/hr per Ci/m2
Composite ECF per FGR table = 29.4769592 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.3490200 Rem/hr per Ci/m2

Ground Source

Point in time = 5.73692894 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	1.3764E+19	1.9168E+06	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	2.2394E+18	6.6782E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.9032E+19	3.7802E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.7164E+19	3.4592E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0920E+19	1.4234E+04	4.1240	0.5546	0.0000
V-52	3.7450 m	0.13	1.0160E+17	8471.	1.4450	1.0680	0.0000
K-42	12.360 h	0.02	1.5407E+19	6487.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	3.0137E+17	4220.	0.0369	0.4043	0.0000
Mg-27	9.4580 m	0.13	7.4608E+16	2463.	0.8914	0.7010	0.0000
U-239	23.470 m	0.21	1.7229E+17	2292.	0.0521	0.3947	0.0000
Cu-66	5.1000 m	0.20	2.7311E+16	1672.	0.0978	1.0670	0.0000
Ga-70	21.130 m	0.14	8.7402E+16	1291.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.7752E+17	1195.	0.0842	0.0000	0.0000
Ti-51	5.8000 m	0.52	2.0096E+16	1082.	0.3692	0.8684	0.0000
Cl-38	37.200 m	0.27	1.2581E+17	1056.	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.1825E+17	927.4	0.0268	0.1090	0.0000
Ca-49	8.7200 m	0.23	2.1765E+16	779.3	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	1.3388E+16	667.8	0.0117	0.0349	0.0000
Eu-152m	9.2750 h	0.10	1.0832E+18	607.8	0.3070	0.5070	0.0000
Rb-86m	1.0170 m	0.33	1.1723E+15	359.9	0.5462	0.0099	0.0000
Ba-139	1.3840 h	0.34	8.7536E+16	329.1	0.0454	0.8990	0.0000
Ba-137m	2.5520 m	0.04	1.5953E+15	195.2	0.5990	0.0652	0.0000
Al-29	6.5600 m	0.91	3.3866E+15	161.2	1.3790	0.9765	0.0000
Rb-88	17.800 m	0.56	8.9257E+15	156.6	0.6370	2.0700	0.0000
Cu-64	12.700 h	0.02	3.0490E+17	124.9	0.1920	0.0734	0.0000
Zn-69	56.400 m	1.60	1.9677E+16	108.9	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.7855E+16	83.12	0.9980	0.0000	0.0000
Sb-122m	4.1900 m	2.15	9.7203E+14	72.43	0.0704	0.0920	0.0000
Sc-49	57.200 m	0.35	1.2189E+16	66.53	0.0026	0.8180	0.0000
Ag-108	2.4000 m	0.83	4.3449E+14	56.52	0.0195	0.6080	0.0011
Sm-155	22.300 m	0.90	4.0127E+15	56.18	0.1040	0.5680	0.0000
Ga-72	14.100 h	0.07	1.3337E+17	49.22	2.7080	0.5028	0.0000
Ba-131m	14.600 m	1.37	2.1758E+15	46.53	0.0766	0.1090	0.0000
Y-90m	3.1890 h	0.31	1.8619E+16	30.38	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4506E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3741E+16	25.51	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8589E+17	24.02	2.3200	0.5340	0.0000
Sb-124m	1.5500 m	5.38	1.0033E+14	20.21	0.4400	0.1120	0.0000
Sm-153	1.9280 d	0.01	1.5618E+17	17.56	0.0617	0.2700	0.0000
Cr-55	3.5400 m	0.85	1.5271E+14	13.47	0.0033	1.1010	0.0000
Xe-135m	15.290 m	0.33	5.9567E+14	12.16	0.4320	0.0984	0.0000
Br-82m	6.0900 m	1.15	2.0612E+14	10.57	0.0028	0.0306	0.0000
Zn-69m	13.760 h	0.15	2.0909E+16	7.907	0.4161	0.0226	0.0000
As-76	1.0930 d	0.34	3.1959E+16	6.340	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	2.0329E+15	5.790	1.2840	0.4639	0.0000
Se-81	18.450 m	0.65	2.5202E+14	4.265	0.0080	0.6107	0.0000
Np-239	2.3550 d	0.17	3.1791E+16	2.927	0.1740	0.1079	0.0000
Se-79m	3.9000 m	0.51	3.3353E+13	2.670	0.0139	0.0000	0.0000
Ne-23	37.200 s	0.54	4.1069E+12	2.068	0.1653	1.8960	0.0000
Ba-135m	1.1960 d	0.70	1.0376E+16	1.881	0.0600	0.2070	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155344D+20

Total number of nuclides = 652
Total activity (Ci) = 2.10550E+06

Total number of decays = 7.19012E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 10.470
Average chain length = 1.0247

Average gamma E (MeV) = 1.6861
Average beta E (MeV) = 1.1793
Average alpha E (MeV) = 1.18647E-15

Composite Exposure Rate Conversion Factor = 29.9227657 R/hr per Ci/m2
Composite ECF per FGR table = 29.0815353 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 21.0766087 Rem/hr per Ci/m2

Ground Source

Point in time = 7.16485834 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Al-28	2.2420	m	0.13	8.8513E+18	1.2327E+06	1.7790	1.2470	0.0000
Co-60m	10.470	m	0.38	2.0374E+18	6.0758E+04	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	1.8913E+19	3.7565E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.7054E+19	3.4372E+04	1.6910	0.8309	0.0000
Na-24	14.960	h	0.01	4.0875E+19	1.4218E+04	4.1240	0.5546	0.0000
V-52	3.7450	m	0.13	7.8006E+16	6504.	1.4450	1.0680	0.0000
K-42	12.360	h	0.02	1.5387E+19	6478.	0.2786	1.4310	0.0000
Th-233	22.300	m	0.45	2.8829E+17	4036.	0.0369	0.4043	0.0000
Mg-27	9.4580	m	0.13	6.7195E+16	2218.	0.8914	0.7010	0.0000
U-239	23.470	m	0.21	1.6518E+17	2197.	0.0521	0.3947	0.0000
Cu-66	5.1000	m	0.20	2.2493E+16	1377.	0.0978	1.0670	0.0000
Ga-70	21.130	m	0.14	8.3402E+16	1232.	0.0087	0.6440	0.0000
Eu-154m	46.400	m	1.08	1.7377E+17	1169.	0.0842	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2251E+17	1028.	1.5110	1.5200	0.0000
Cs-134m	2.9080	h	0.10	5.1532E+17	922.2	0.0268	0.1090	0.0000
Ti-51	5.8000	m	0.52	1.6943E+16	912.1	0.3692	0.8684	0.0000
Ca-49	8.7200	m	0.23	1.9429E+16	695.7	3.1700	0.8697	0.0000
Eu-152m	9.2750	h	0.10	1.0813E+18	606.7	0.3070	0.5070	0.0000
Nb-94m	6.2600	m	0.16	1.1430E+16	570.1	0.0117	0.0349	0.0000
Ba-139	1.3840	h	0.34	8.6499E+16	325.2	0.0454	0.8990	0.0000
Rb-88	17.800	m	0.56	8.4429E+15	148.1	0.6370	2.0700	0.0000
Al-29	6.5600	m	0.91	2.9123E+15	138.6	1.3790	0.9765	0.0000
Rb-86m	1.0170	m	0.33	4.4297E+14	136.0	0.5462	0.0099	0.0000
Ba-137m	2.5520	m	0.04	1.0824E+15	132.4	0.5990	0.0652	0.0000
Cu-64	12.700	h	0.02	3.0451E+17	124.8	0.1920	0.0734	0.0490
Zn-69	56.400	m	1.60	1.9360E+16	107.2	0.0003	0.3216	0.0000
Hf-180m	5.5000	h	1.82	8.7592E+16	82.87	0.9980	0.0000	0.0000
Sc-49	57.200	m	0.35	1.4294E+16	78.03	0.0026	0.8180	0.0000
Sb-122m	4.1900	m	2.15	7.6752E+14	57.19	0.0704	0.0920	0.0000
Sm-155	22.300	m	0.90	3.8385E+15	53.74	0.1040	0.5680	0.0000
Ga-72	14.100	h	0.07	1.3322E+17	49.17	2.7080	0.5028	0.0000
Ba-131m	14.600	m	1.37	2.0332E+15	43.48	0.0766	0.1090	0.0000
Ag-108	2.4000	m	0.83	2.8765E+14	37.42	0.0195	0.6080	0.0011
Y-90m	3.1890	h	0.31	1.8523E+16	30.23	0.6340	0.0475	0.0000
Ar-37	35.030	d	0.09	4.4506E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030	h	0.11	1.3661E+16	25.36	0.3215	0.0674	0.0000
La-140	1.6780	d	0.01	1.8582E+17	24.01	2.3200	0.5340	0.0000
Sm-153	1.9280	d	0.01	1.5612E+17	17.56	0.0617	0.2700	0.0000
Xe-135m	15.290	m	0.33	5.5833E+14	11.40	0.4320	0.0984	0.0000
Sb-124m	1.5500	m	5.38	5.2979E+13	10.67	0.4400	0.1120	0.0000
Cr-55	3.5400	m	0.85	1.1547E+14	10.18	0.0033	1.1010	0.0000
Br-82m	6.0900	m	1.15	1.7520E+14	8.982	0.0028	0.0306	0.0000
Zn-69m	13.760	h	0.15	2.0884E+16	7.898	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	3.1939E+16	6.336	0.4300	1.0610	0.0000
Ar-41	1.8270	h	0.36	2.0146E+15	5.738	1.2840	0.4639	0.0000
Se-81	18.450	m	0.65	2.4338E+14	4.119	0.0080	0.6107	0.0000
Np-239	2.3550	d	0.17	3.8895E+16	3.581	0.1740	0.1079	0.0000
Se-79m	3.9000	m	0.51	2.5877E+13	2.072	0.0139	0.0000	0.0000
Ba-135m	1.1960	d	0.70	1.0370E+16	1.880	0.0600	0.2070	0.0000
Sc-47	3.3510	d	0.06	2.8042E+16	1.814	0.1089	0.1619	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 651
Total activity (Ci) = 1.41126E+06

Total number of decays = 7.73953E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 11.270
Average chain length = 1.0247

Average gamma E (MeV) = 1.6503
Average beta E (MeV) = 1.1522
Average alpha E (MeV) = 2.71009E-15

Composite Exposure Rate Conversion Factor = 29.2512722 R/hr per Ci/m2
Composite ECF per FGR table = 28.4342060 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.6283798 Rem/hr per Ci/m2

Ground Source

Point in time = 8.94820118 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	5.0999E+18	7.1023E+05	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	1.8105E+18	5.3992E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.8765E+19	3.7270E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.6919E+19	3.4099E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0818E+19	1.4199E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5361E+19	6467.	0.2786	1.4310	0.0000
V-52	3.7450 m	0.13	5.6076E+16	4675.	1.4450	1.0680	0.0000
Th-233	22.300 m	0.45	2.7274E+17	3819.	0.0369	0.4043	0.0000
U-239	23.470 m	0.21	1.5670E+17	2085.	0.0521	0.3947	0.0000
Mg-27	9.4580 m	0.13	5.8962E+16	1946.	0.8914	0.7010	0.0000
Ga-70	21.130 m	0.14	7.8663E+16	1162.	0.0087	0.6440	0.0000
Eu-154m	46.400 m	1.08	1.6920E+17	1139.	0.0842	0.0000	0.0000
Cu-66	5.1000 m	0.20	1.7652E+16	1081.	0.0978	1.0670	0.0000
Cl-38	37.200 m	0.27	1.1850E+17	994.6	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.1168E+17	915.6	0.0268	0.1090	0.0000
Ti-51	5.8000 m	0.52	1.3691E+16	737.0	0.3692	0.8684	0.0000
Eu-152m	9.2750 h	0.10	1.0789E+18	605.3	0.3070	0.5070	0.0000
Ca-49	8.7200 m	0.23	1.6861E+16	603.7	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	9.3822E+15	468.0	0.0117	0.0349	0.0000
Ba-139	1.3840 h	0.34	8.5221E+16	320.4	0.0454	0.8990	0.0000
Rb-88	17.800 m	0.56	7.8765E+15	138.2	0.6370	2.0700	0.0000
Cu-64	12.700 h	0.02	3.0402E+17	124.6	0.1920	0.0734	0.0490
Al-29	6.5600 m	0.91	2.4121E+15	114.8	1.3790	0.9765	0.0000
Zn-69	56.400 m	1.60	1.8971E+16	105.0	0.0003	0.3216	0.0000
Sc-49	57.200 m	0.35	1.6529E+16	90.22	0.0026	0.8180	0.0000
Hf-180m	5.5000 h	1.82	8.7264E+16	82.56	0.9980	0.0000	0.0000
Ba-137m	2.5520 m	0.04	6.6687E+14	81.59	0.5990	0.0652	0.0000
Sm-155	22.300 m	0.90	3.6315E+15	50.85	0.1040	0.5680	0.0000
Ga-72	14.100 h	0.07	1.3302E+17	49.09	2.7080	0.5028	0.0000
Sb-122m	4.1900 m	2.15	5.7143E+14	42.58	0.0704	0.0920	0.0000
Rb-86m	1.0170 m	0.33	1.3137E+14	40.33	0.5462	0.0099	0.0000
Ba-131m	14.600 m	1.37	1.8682E+15	39.95	0.0766	0.1090	0.0000
Y-90m	3.1890 h	0.31	1.8404E+16	30.03	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4505E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3561E+16	25.18	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8572E+17	24.00	2.3200	0.5340	0.0000
Ag-108	2.4000 m	0.83	1.7187E+14	22.36	0.0195	0.6080	0.0011
Sm-153	1.9280 d	0.01	1.5605E+17	17.55	0.0617	0.2700	0.0000
Xe-135m	15.290 m	0.33	5.1497E+14	10.52	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0853E+16	7.886	0.4161	0.0226	0.0000
Br-82m	6.0900 m	1.15	1.4302E+14	7.332	0.0028	0.0306	0.0000
Cr-55	3.5400 m	0.85	8.1433E+13	7.182	0.0033	1.1010	0.0000
As-76	1.0930 d	0.34	3.1914E+16	6.331	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	1.9920E+15	5.674	1.2840	0.4639	0.0000
Sb-124m	1.5500 m	5.38	2.3865E+13	4.807	0.4400	0.1120	0.0000
Np-239	2.3550 d	0.17	4.7354E+16	4.360	0.1740	0.1079	0.0000
Se-81	18.450 m	0.65	2.3311E+14	3.945	0.0080	0.6107	0.0000
Ba-135m	1.1960 d	0.70	1.0363E+16	1.879	0.0600	0.2070	0.0000
Sc-47	3.3510 d	0.06	2.8035E+16	1.814	0.1089	0.1619	0.0000
P-32	14.270 d	0.28	1.1746E+17	1.785	0.0012	0.6949	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 650
Total activity (Ci) = 8.78000E+05

Total number of decays = 8.18318E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 11.916
Average chain length = 1.0247

Average gamma E (MeV) = 1.5894
Average beta E (MeV) = 1.1058
Average alpha E (MeV) = 6.65861E-15

Composite Exposure Rate Conversion Factor = 28.1050911 R/hr per Ci/m2
Composite ECF per FGR table = 27.3420391 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 19.8674755 Rem/hr per Ci/m2

Ground Source

Point in time = 11.1754322 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	2.5616E+18	3.5674E+05	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	1.5623E+18	4.6590E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.8581E+19	3.6906E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.6751E+19	3.3761E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0748E+19	1.4174E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5329E+19	6454.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	2.5450E+17	3563.	0.0369	0.4043	0.0000
V-52	3.7450 m	0.13	3.7132E+16	3096.	1.4450	1.0680	0.0000
U-239	23.470 m	0.21	1.4673E+17	1952.	0.0521	0.3947	0.0000
Mg-27	9.4580 m	0.13	5.0082E+16	1653.	0.8914	0.7010	0.0000
Eu-154m	46.400 m	1.08	1.6366E+17	1101.	0.0842	0.0000	0.0000
Ga-70	21.130 m	0.14	7.3121E+16	1080.	0.0087	0.6440	0.0000
Cl-38	37.200 m	0.27	1.1368E+17	954.2	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.0718E+17	907.6	0.0268	0.1090	0.0000
Cu-66	5.1000 m	0.20	1.3041E+16	798.4	0.0978	1.0670	0.0000
Eu-152m	9.2750 h	0.10	1.0759E+18	603.7	0.3070	0.5070	0.0000
Ti-51	5.8000 m	0.52	1.0492E+16	564.8	0.3692	0.8684	0.0000
Ca-49	8.7200 m	0.23	1.4126E+16	505.8	3.1700	0.8697	0.0000
Nb-94m	6.2600 m	0.16	7.3317E+15	365.7	0.0117	0.0349	0.0000
Ba-139	1.3840 h	0.34	8.3651E+16	314.5	0.0454	0.8990	0.0000
Rb-88	17.800 m	0.56	7.2222E+15	126.7	0.6370	2.0700	0.0000
Cu-64	12.700 h	0.02	3.0340E+17	124.3	0.1920	0.0734	0.0490
Sc-49	57.200 m	0.35	1.8787E+16	102.5	0.0026	0.8180	0.0000
Zn-69	56.400 m	1.60	1.8497E+16	102.4	0.0003	0.3216	0.0000
Al-29	6.5600 m	0.91	1.9063E+15	90.73	1.3790	0.9765	0.0000
Hf-180m	5.5000 h	1.82	8.6857E+16	82.18	0.9980	0.0000	0.0000
Ga-72	14.100 h	0.07	1.3278E+17	49.00	2.7080	0.5028	0.0000
Sm-155	22.300 m	0.90	3.3886E+15	47.44	0.1040	0.5680	0.0000
Ba-137m	2.5520 m	0.04	3.6418E+14	44.56	0.5990	0.0652	0.0000
Ba-131m	14.600 m	1.37	1.6807E+15	35.94	0.0766	0.1090	0.0000
Y-90m	3.1890 h	0.31	1.8256E+16	29.79	0.6340	0.0475	0.0000
Sb-122m	4.1900 m	2.15	3.9532E+14	29.46	0.0704	0.0920	0.0000
Ar-37	35.030 d	0.09	4.4503E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3437E+16	24.95	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8560E+17	23.98	2.3200	0.5340	0.0000
Sm-153	1.9280 d	0.01	1.5596E+17	17.54	0.0617	0.2700	0.0000
Ag-108	2.4000 m	0.83	9.0329E+13	11.75	0.0195	0.6080	0.0011
Xe-135m	15.290 m	0.33	4.6551E+14	9.506	0.4320	0.0984	0.0000
Rb-86m	1.0170 m	0.33	2.8791E+13	8.839	0.5462	0.0099	0.0000
Zn-69m	13.760 h	0.15	2.0814E+16	7.871	0.4161	0.0226	0.0000
As-76	1.0930 d	0.34	3.1883E+16	6.325	0.4300	1.0610	0.0000
Br-82m	6.0900 m	1.15	1.1099E+14	5.690	0.0028	0.0306	0.0000
Ar-41	1.8270 h	0.36	1.9642E+15	5.595	1.2840	0.4639	0.0000
Np-239	2.3550 d	0.17	5.7306E+16	5.276	0.1740	0.1079	0.0000
Cr-55	3.5400 m	0.85	5.2651E+13	4.644	0.0033	1.1010	0.0000
Se-81	18.450 m	0.65	2.2105E+14	3.741	0.0080	0.6107	0.0000
Ba-135m	1.1960 d	0.70	1.0353E+16	1.877	0.0600	0.2070	0.0000
Sc-47	3.3510 d	0.06	2.8026E+16	1.813	0.1089	0.1619	0.0000
P-32	14.270 d	0.28	1.1746E+17	1.785	0.0012	0.6949	0.0000
Sb-124m	1.5500 m	5.38	8.8145E+12	1.776	0.4400	0.1120	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 650
Total activity (Ci) = 5.13144E+05

Total number of decays = 8.51707E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 12.402
Average chain length = 1.0247

Average gamma E (MeV) = 1.4865
Average beta E (MeV) = 1.0258
Average alpha E (MeV) = 1.73642E-14

Composite Exposure Rate Conversion Factor = 26.1526279 R/hr per Ci/m2
Composite ECF per FGR table = 25.5091839 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 18.5814762 Rem/hr per Ci/m2

Ground Source

Point in time = 13.9570141 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	1.0840E+18	1.5096E+05	1.7790	1.2470	0.0000
Co-60m	10.470 m	0.38	1.2995E+18	3.8754E+04	0.0066	0.0536	0.0000
Si-31	2.6200 h	0.38	1.8355E+19	3.6456E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.6544E+19	3.3343E+04	1.6910	0.8309	0.0000
Na-24	14.960 h	0.01	4.0661E+19	1.4144E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5289E+19	6437.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	2.3342E+17	3268.	0.0369	0.4043	0.0000
V-52	3.7450 m	0.13	2.2190E+16	1850.	1.4450	1.0680	0.0000
U-239	23.470 m	0.21	1.3515E+17	1798.	0.0521	0.3947	0.0000
Mg-27	9.4580 m	0.13	4.0846E+16	1348.	0.8914	0.7010	0.0000
Eu-154m	46.400 m	1.08	1.5700E+17	1056.	0.0842	0.0000	0.0000
Ga-70	21.130 m	0.14	6.6744E+16	986.2	0.0087	0.6440	0.0000
Cl-38	37.200 m	0.27	1.0794E+17	906.0	1.5110	1.5200	0.0000
Cs-134m	2.9080 h	0.10	5.0160E+17	897.6	0.0268	0.1090	0.0000
Eu-152m	9.2750 h	0.10	1.0722E+18	601.6	0.3070	0.5070	0.0000
Cu-66	5.1000 m	0.20	8.9358E+15	547.1	0.0978	1.0670	0.0000
Ca-49	8.7200 m	0.23	1.1323E+16	405.4	3.1700	0.8697	0.0000
Ti-51	5.8000 m	0.52	7.5244E+15	405.1	0.3692	0.8684	0.0000
Ba-139	1.3840 h	0.34	8.1731E+16	307.3	0.0454	0.8990	0.0000
Nb-94m	6.2600 m	0.16	5.3882E+15	268.7	0.0117	0.0349	0.0000
Cu-64	12.700 h	0.02	3.0263E+17	124.0	0.1920	0.0734	0.0490
Sc-49	57.200 m	0.35	2.0918E+16	114.2	0.0026	0.8180	0.0000
Rb-88	17.800 m	0.56	6.4808E+15	113.7	0.6370	2.0700	0.0000
Zn-69	56.400 m	1.60	1.7923E+16	99.22	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.6351E+16	81.70	0.9980	0.0000	0.0000
Al-29	6.5600 m	0.91	1.4209E+15	67.63	1.3790	0.9765	0.0000
Ga-72	14.100 h	0.07	1.3248E+17	48.89	2.7080	0.5028	0.0000
Sm-155	22.300 m	0.90	3.1079E+15	43.52	0.1040	0.5680	0.0000
Ba-131m	14.600 m	1.37	1.4728E+15	31.50	0.0766	0.1090	0.0000
Y-90m	3.1890 h	0.31	1.8073E+16	29.49	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4501E+18	27.55	0.0002	0.0019	0.0000
Sr-87m	2.8030 h	0.11	1.3283E+16	24.66	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8546E+17	23.96	2.3200	0.5340	0.0000
Ba-137m	2.5520 m	0.04	1.7108E+14	20.93	0.5990	0.0652	0.0000
Sb-122m	4.1900 m	2.15	2.4952E+14	18.59	0.0704	0.0920	0.0000
Sm-153	1.9280 d	0.01	1.5586E+17	17.53	0.0617	0.2700	0.0000
Xe-135m	15.290 m	0.33	4.1036E+14	8.380	0.4320	0.0984	0.0000
Zn-69m	13.760 h	0.15	2.0765E+16	7.853	0.4161	0.0226	0.0000
Np-239	2.3550 d	0.17	6.8841E+16	6.338	0.1740	0.1079	0.0000
As-76	1.0930 d	0.34	3.1844E+16	6.317	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	1.9299E+15	5.497	1.2840	0.4639	0.0000
Ag-108	2.4000 m	0.83	4.0452E+13	5.263	0.0195	0.6080	0.0011
Br-82m	6.0900 m	1.15	8.0872E+13	4.146	0.0028	0.0306	0.0000
Se-81	18.450 m	0.65	2.0710E+14	3.505	0.0080	0.6107	0.0000
Cr-55	3.5400 m	0.85	3.0540E+13	2.694	0.0033	1.1010	0.0000
Ba-135m	1.1960 d	0.70	1.0342E+16	1.875	0.0600	0.2070	0.0000
Sc-47	3.3510 d	0.06	2.8015E+16	1.813	0.1089	0.1619	0.0000
P-32	14.270 d	0.28	1.1744E+17	1.785	0.0012	0.6949	0.0000
Kr-85m	4.4810 h	0.18	1.5126E+15	1.757	0.1570	0.2282	0.0000
Sr-85m	1.1270 h	0.07	3.6150E+14	1.669	0.2160	0.0140	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155340D+20

Total number of nuclides = 647
Total activity (Ci) = 2.95712E+05

Total number of decays = 8.75768E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 12.752
Average chain length = 1.0247

Average gamma E (MeV) = 1.3297
Average beta E (MeV) = 0.90045
Average alpha E (MeV) = 4.57317E-14

Composite Exposure Rate Conversion Factor = 23.1395130 R/hr per Ci/m2
Composite ECF per FGR table = 22.7379017 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.6209450 Rem/hr per Ci/m2

Ground Source

Point in time = 17.4309502 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Al-28	2.2420 m	0.13	3.7033E+17	5.1574E+04	1.7790	1.2470	0.0000
Si-31	2.6200 h	0.38	1.8076E+19	3.5902E+04	0.0018	0.5952	0.0000
Mn-56	2.5820 h	0.19	1.6289E+19	3.2829E+04	1.6910	0.8309	0.0000
Co-60m	10.470 m	0.38	1.0325E+18	3.0792E+04	0.0066	0.0536	0.0000
Na-24	14.960 h	0.01	4.0552E+19	1.4106E+04	4.1240	0.5546	0.0000
K-42	12.360 h	0.02	1.5240E+19	6416.	0.2786	1.4310	0.0000
Th-233	22.300 m	0.45	2.0953E+17	2934.	0.0369	0.4043	0.0000
U-239	23.470 m	0.21	1.2197E+17	1623.	0.0521	0.3947	0.0000
Mg-27	9.4580 m	0.13	3.1665E+16	1045.	0.8914	0.7010	0.0000
Eu-154m	46.400 m	1.08	1.4906E+17	1003.	0.0842	0.0000	0.0000
V-52	3.7450 m	0.13	1.1666E+16	972.6	1.4450	1.0680	0.0000
Cs-134m	2.9080 h	0.10	4.9473E+17	885.3	0.0268	0.1090	0.0000
Ga-70	21.130 m	0.14	5.9555E+16	880.0	0.0087	0.6440	0.0000
Cl-38	37.200 m	0.27	1.0118E+17	849.2	1.5110	1.5200	0.0000
Eu-152m	9.2750 h	0.10	1.0676E+18	599.0	0.3070	0.5070	0.0000
Cu-66	5.1000 m	0.20	5.5729E+15	341.2	0.0978	1.0670	0.0000
Ca-49	8.7200 m	0.23	8.5912E+15	307.6	3.1700	0.8697	0.0000
Ba-139	1.3840 h	0.34	7.9395E+16	298.5	0.0454	0.8990	0.0000
Ti-51	5.8000 m	0.52	4.9678E+15	267.4	0.3692	0.8684	0.0000
Nb-94m	6.2600 m	0.16	3.6677E+15	182.9	0.0117	0.0349	0.0000
Sc-49	57.200 m	0.35	2.2728E+16	124.1	0.0026	0.8180	0.0000
Cu-64	12.700 h	0.02	3.0168E+17	123.6	0.1920	0.0734	0.0490
Rb-88	17.800 m	0.56	5.6608E+15	99.30	0.6370	2.0700	0.0000
Zn-69	56.400 m	1.60	1.7233E+16	95.40	0.0003	0.3216	0.0000
Hf-180m	5.5000 h	1.82	8.5723E+16	81.11	0.9980	0.0000	0.0000
Ga-72	14.100 h	0.07	1.3210E+17	48.75	2.7080	0.5028	0.0000
Al-29	6.5600 m	0.91	9.8432E+14	46.85	1.3790	0.9765	0.0000
Sm-155	22.300 m	0.90	2.7898E+15	39.06	0.1040	0.5680	0.0000
Y-90m	3.1890 h	0.31	1.7847E+16	29.12	0.6340	0.0475	0.0000
Ar-37	35.030 d	0.09	4.4499E+18	27.54	0.0002	0.0019	0.0000
Ba-131m	14.600 m	1.37	1.2489E+15	26.71	0.0766	0.1090	0.0000
Sr-87m	2.8030 h	0.11	1.3095E+16	24.31	0.3215	0.0674	0.0000
La-140	1.6780 d	0.01	1.8527E+17	23.94	2.3200	0.5340	0.0000
Sm-153	1.9280 d	0.01	1.5572E+17	17.51	0.0617	0.2700	0.0000
Sb-122m	4.1900 m	2.15	1.4045E+14	10.47	0.0704	0.0920	0.0000
Ba-137m	2.5520 m	0.04	6.6593E+13	8.147	0.5990	0.0652	0.0000
Zn-69m	13.760 h	0.15	2.0705E+16	7.830	0.4161	0.0226	0.0000
Np-239	2.3550 d	0.17	8.1966E+16	7.547	0.1740	0.1079	0.0000
Xe-135m	15.290 m	0.33	3.5057E+14	7.159	0.4320	0.0984	0.0000
As-76	1.0930 d	0.34	3.1795E+16	6.307	0.4300	1.0610	0.0000
Ar-41	1.8270 h	0.36	1.8880E+15	5.378	1.2840	0.4639	0.0000
Se-81	18.450 m	0.65	1.9123E+14	3.236	0.0080	0.6107	0.0000
Br-82m	6.0900 m	1.15	5.4460E+13	2.792	0.0028	0.0306	0.0000
Ag-108	2.4000 m	0.83	1.4832E+13	1.930	0.0195	0.6080	0.0011
Ba-135m	1.1960 d	0.70	1.0327E+16	1.872	0.0600	0.2070	0.0000
Sc-47	3.3510 d	0.06	2.8001E+16	1.812	0.1089	0.1619	0.0000
P-32	14.270 d	0.28	1.1743E+17	1.784	0.0012	0.6949	0.0000
Kr-85m	4.4810 h	0.18	1.4991E+15	1.741	0.1570	0.2282	0.0000
Y-90	2.6710 d	0.12	2.0112E+16	1.633	0.0020	0.9336	0.0000
Sr-85m	1.1270 h	0.07	3.4885E+14	1.611	0.2160	0.0140	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155356D+20

Total number of nuclides = 644
Total activity (Ci) = 1.84706E+05

Total number of decays = 8.93602E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 13.012
Average chain length = 1.0247

Average gamma E (MeV) = 1.1544
Average beta E (MeV) = 0.75310
Average alpha E (MeV) = 1.10512E-13

Composite Exposure Rate Conversion Factor = 19.6929588 R/hr per Ci/m2
Composite ECF per FGR table = 19.6741276 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.4295483 Rem/hr per Ci/m2

Ground Source

Point in time = 21.7695389 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Si-31	2.6200 h 0.38	1.7733E+19	3.5222E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.5976E+19	3.2198E+04	1.6910	0.8309	0.0000	0.0000
Co-60m	10.470 m 0.38	7.7476E+17	2.3104E+04	0.0066	0.0536	0.0000	0.0000
Na-24	14.960 h 0.01	4.0416E+19	1.4059E+04	4.1240	0.5546	0.0000	0.0000
Al-28	2.2420 m 0.13	9.6841E+16	1.3486E+04	1.7790	1.2470	0.0000	0.0000
K-42	12.360 h 0.02	1.5178E+19	6390.	0.2786	1.4310	0.0000	0.0000
Th-233	22.300 m 0.45	1.8309E+17	2564.	0.0369	0.4043	0.0000	0.0000
U-239	23.470 m 0.21	1.0731E+17	1428.	0.0521	0.3947	0.0000	0.0000
Eu-154m	46.400 m 1.08	1.3971E+17	940.1	0.0842	0.0000	0.0000	0.0000
Cs-134m	2.9080 h 0.10	4.8627E+17	870.2	0.0268	0.1090	0.0000	0.0000
Cl-38	37.200 m 0.27	9.3319E+16	783.3	1.5110	1.5200	0.0000	0.0000
Ga-70	21.130 m 0.14	5.1655E+16	763.3	0.0087	0.6440	0.0000	0.0000
Mg-27	9.4580 m 0.13	2.3041E+16	760.6	0.8914	0.7010	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.0618E+18	595.7	0.3070	0.5070	0.0000	0.0000
V-52	3.7450 m 0.13	5.2261E+15	435.7	1.4450	1.0680	0.0000	0.0000
Ba-139	1.3840 h 0.34	7.6572E+16	287.9	0.0454	0.8990	0.0000	0.0000
Ca-49	8.7200 m 0.23	6.0852E+15	217.9	3.1700	0.8697	0.0000	0.0000
Cu-66	5.1000 m 0.20	3.0903E+15	189.2	0.0978	1.0670	0.0000	0.0000
Tl-51	5.8000 m 0.52	2.9579E+15	159.2	0.3692	0.8684	0.0000	0.0000
Sc-49	57.200 m 0.35	2.4002E+16	131.0	0.0026	0.8180	0.0000	0.0000
Cu-64	12.700 h 0.02	3.0049E+17	123.1	0.1920	0.0734	0.0490	0.0000
Nb-94m	6.2600 m 0.16	2.2686E+15	113.1	0.0117	0.0349	0.0000	0.0000
Zn-69	56.400 m 1.60	1.6412E+16	90.85	0.0003	0.3216	0.0000	0.0000
Rb-88	17.800 m 0.56	4.7808E+15	83.86	0.6370	2.0700	0.0000	0.0000
Hf-180m	5.5000 h 1.82	8.4946E+16	80.37	0.9980	0.0000	0.0000	0.0000
Ga-72	14.100 h 0.07	1.3163E+17	48.58	2.7080	0.5028	0.0000	0.0000
Sm-155	22.300 m 0.90	2.4379E+15	34.13	0.1040	0.5680	0.0000	0.0000
Al-29	6.5600 m 0.91	6.2237E+14	29.62	1.3790	0.9765	0.0000	0.0000
Y-90m	3.1890 h 0.31	1.7568E+16	28.67	0.6340	0.0475	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4497E+18	27.54	0.0002	0.0019	0.0000	0.0000
La-140	1.6780 d 0.01	1.8504E+17	23.91	2.3200	0.5340	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.2863E+16	23.88	0.3215	0.0674	0.0000	0.0000
Ba-131m	14.600 m 1.37	1.0164E+15	21.74	0.0766	0.1090	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.5555E+17	17.49	0.0617	0.2700	0.0000	0.0000
Np-239	2.3550 d 0.17	9.6556E+16	8.890	0.1740	0.1079	0.0000	0.0000
Zn-69m	13.760 h 0.15	2.0629E+16	7.802	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	3.1734E+16	6.295	0.4300	1.0610	0.0000	0.0000
Xe-135m	15.290 m 0.33	2.8798E+14	5.881	0.4320	0.0984	0.0000	0.0000
Ar-41	1.8270 h 0.36	1.8369E+15	5.232	1.2840	0.4639	0.0000	0.0000
Sb-122m	4.1900 m 2.15	6.8520E+13	5.106	0.0704	0.0920	0.0000	0.0000
Se-81	18.450 m 0.65	1.7358E+14	2.937	0.0080	0.6107	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.0495E+13	2.508	0.5990	0.0652	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0309E+16	1.869	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.7984E+16	1.811	0.1089	0.1619	0.0000	0.0000
P-32	14.270 d 0.28	1.1741E+17	1.784	0.0012	0.6949	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.4824E+15	1.722	0.1570	0.2282	0.0000	0.0000
Br-82m	6.0900 m 1.15	3.3237E+13	1.704	0.0028	0.0306	0.0000	0.0000
Y-90	2.6710 d 0.12	2.0374E+16	1.654	0.0020	0.9336	0.0000	0.0000
Sr-85m	1.1270 h 0.07	3.3368E+14	1.541	0.2160	0.0140	0.0000	0.0000
Pa-233	27.000 d 0.37	1.7707E+17	1.422	0.2175	0.0664	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 644
Total activity (Ci) = 1.35407E+05

Total number of decays = 9.08595E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 13.230
Average chain length = 1.0247

Average gamma E (MeV) = 1.0531
Average beta E (MeV) = 0.65452
Average alpha E (MeV) = 2.25974E-13

Composite Exposure Rate Conversion Factor = 17.5577297 R/hr per Ci/m2
Composite ECF per FGR table = 17.9445286 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.1636658 Rem/hr per Ci/m2

Ground Source

Point in time = 27.1880074 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)				
						gamma	beta(-)	beta(+)	alpha	
Si-31	2.6200		h	0.38	1.7315E+19	3.4390E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820		h	0.19	1.5593E+19	3.1426E+04	1.6910	0.8309	0.0000	0.0000
Co-60m	10.470		m	0.38	5.4123E+17	1.6140E+04	0.0066	0.0536	0.0000	0.0000
Na-24	14.960		h	0.01	4.0248E+19	1.4000E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360		h	0.02	1.5101E+19	6358.	0.2786	1.4310	0.0000	0.0000
Al-28	2.2420		m	0.13	1.8135E+16	2526.	1.7790	1.2470	0.0000	0.0000
Th-233	22.300		m	0.45	1.5471E+17	2166.	0.0369	0.4043	0.0000	0.0000
U-239	23.470		m	0.21	9.1438E+16	1216.	0.0521	0.3947	0.0000	0.0000
Eu-154m	46.400		m	1.08	1.2885E+17	867.0	0.0842	0.0000	0.0000	0.0000
Cs-134m	2.9080		h	0.10	4.7592E+17	851.6	0.0268	0.1090	0.0000	0.0000
Cl-38	37.200		m	0.27	8.4358E+16	708.0	1.5110	1.5200	0.0000	0.0000
Ga-70	21.130		m	0.14	4.3243E+16	639.0	0.0087	0.6440	0.0000	0.0000
Eu-152m	9.2750		h	0.10	1.0547E+18	591.7	0.3070	0.5070	0.0000	0.0000
Mg-27	9.4580		m	0.13	1.5489E+16	511.3	0.8914	0.7010	0.0000	0.0000
Ba-139	1.3840		h	0.34	7.3185E+16	275.2	0.0454	0.8990	0.0000	0.0000
V-52	3.7450		m	0.13	1.9170E+15	159.8	1.4450	1.0680	0.0000	0.0000
Ca-49	8.7200		m	0.23	3.9557E+15	141.6	3.1700	0.8697	0.0000	0.0000
Sc-49	57.200		m	0.35	2.4533E+16	133.9	0.0026	0.8180	0.0000	0.0000
Cu-64	12.700		h	0.02	2.9901E+17	122.5	0.1920	0.0734	0.0490	0.0000
Cu-66	5.1000		m	0.20	1.4797E+15	90.59	0.0978	1.0670	0.0000	0.0000
Zn-69	56.400		m	1.60	1.5445E+16	85.50	0.0003	0.3216	0.0000	0.0000
Ti-51	5.8000		m	0.52	1.5480E+15	83.33	0.3692	0.8684	0.0000	0.0000
Hf-180m	5.5000		h	1.82	8.3984E+16	79.46	0.9980	0.0000	0.0000	0.0000
Rb-88	17.800		m	0.56	3.8714E+15	67.91	0.6370	2.0700	0.0000	0.0000
Nb-94m	6.2600		m	0.16	1.2451E+15	62.10	0.0117	0.0349	0.0000	0.0000
Ga-72	14.100		h	0.07	1.3105E+17	48.37	2.7080	0.5028	0.0000	0.0000
Sm-155	22.300		m	0.90	2.0600E+15	28.84	0.1040	0.5680	0.0000	0.0000
Y-90m	3.1890		h	0.31	1.7227E+16	28.11	0.6340	0.0475	0.0000	0.0000
Ar-37	35.030		d	0.09	4.4493E+18	27.54	0.0002	0.0019	0.0000	0.0000
La-140	1.6780		d	0.01	1.8475E+17	23.87	2.3200	0.5340	0.0000	0.0000
Sr-87m	2.8030		h	0.11	1.2579E+16	23.35	0.3215	0.0674	0.0000	0.0000
Sm-153	1.9280		d	0.01	1.5534E+17	17.47	0.0617	0.2700	0.0000	0.0000
Ba-131m	14.600		m	1.37	7.8584E+14	16.81	0.0766	0.1090	0.0000	0.0000
Al-29	6.5600		m	0.91	3.5107E+14	16.71	1.3790	0.9765	0.0000	0.0000
Np-239	2.3550		d	0.17	1.1231E+17	10.34	0.1740	0.1079	0.0000	0.0000
Zn-69m	13.760		h	0.15	2.0536E+16	7.766	0.4161	0.0226	0.0000	0.0000
As-76	1.0930		d	0.34	3.1659E+16	6.280	0.4300	1.0610	0.0000	0.0000
Ar-41	1.8270		h	0.36	1.7750E+15	5.056	1.2840	0.4639	0.0000	0.0000
Xe-135m	15.290		m	0.33	2.2526E+14	4.600	0.4320	0.0984	0.0000	0.0000
Se-81	18.450		m	0.65	1.5442E+14	2.613	0.0080	0.6107	0.0000	0.0000
Sb-122m	4.1900		m	2.15	2.7959E+13	2.083	0.0704	0.0920	0.0000	0.0000
Ba-135m	1.1960		d	0.70	1.0287E+16	1.865	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510		d	0.06	2.7962E+16	1.809	0.1089	0.1619	0.0000	0.0000
P-32	14.270		d	0.28	1.1739E+17	1.784	0.0012	0.6949	0.0000	0.0000
Kr-85m	4.4810		h	0.18	1.4619E+15	1.698	0.1570	0.2282	0.0000	0.0000
Y-90	2.6710		d	0.12	2.0696E+16	1.680	0.0020	0.9336	0.0000	0.0000
Pa-233	27.000		d	0.37	2.0543E+17	1.650	0.2175	0.0664	0.0000	0.0000
Sr-85m	1.1270		h	0.07	3.1565E+14	1.457	0.2160	0.0140	0.0000	0.0000
Rb-86	18.630		d	0.11	1.1692E+17	1.361	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351		v	0.80	5.7259E+18	1.243	0.0016	0.0038	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155342D+20

Total number of nuclides = 641
Total activity (Ci) = 1.13993E+05

Total number of decays = 9.23387E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 13.446
Average chain length = 1.0247

Average gamma E (MeV) = 1.0563
Average beta E (MeV) = 0.63301
Average alpha E (MeV) = 3.99019E-13

Composite Exposure Rate Conversion Factor = 17.3647022 R/hr per Ci/m2
Composite ECF per FGR table = 18.0490913 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.2037706 Rem/hr per Ci/m2

Ground Source

Point in time = 33.9551735 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Si-31	2.6200 h 0.38	1.6806E+19	3.3379E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.5128E+19	3.0489E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960 h 0.01	4.0038E+19	1.3927E+04	4.1240	0.5546	0.0000	0.0000
Co-60m	10.470 m 0.38	3.4579E+17	1.0312E+04	0.0066	0.0536	0.0000	0.0000
K-42	12.360 h 0.02	1.5006E+19	6318.	0.2786	1.4310	0.0000	0.0000
Th-233	22.300 m 0.45	1.2537E+17	1755.	0.0369	0.4043	0.0000	0.0000
U-239	23.470 m 0.21	7.4874E+16	996.1	0.0521	0.3947	0.0000	0.0000
Cs-134m	2.9080 h 0.10	4.6329E+17	829.1	0.0268	0.1090	0.0000	0.0000
Eu-154m	46.400 m 1.08	1.1646E+17	783.6	0.0842	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	7.4364E+16	624.2	1.5110	1.5200	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.0458E+18	586.8	0.3070	0.5070	0.0000	0.0000
Ga-70	21.130 m 0.14	3.4634E+16	511.8	0.0087	0.6440	0.0000	0.0000
Al-28	2.2420 m 0.13	2.2383E+15	311.7	1.7790	1.2470	0.0000	0.0000
Mg-27	9.4580 m 0.13	9.4330E+15	311.4	0.8914	0.7010	0.0000	0.0000
Ba-139	1.3840 h 0.34	6.9166E+16	260.1	0.0454	0.8990	0.0000	0.0000
Sc-49	57.200 m 0.35	2.4175E+16	132.0	0.0026	0.8180	0.0000	0.0000
Cu-64	12.700 h 0.02	2.9718E+17	121.8	0.1920	0.0734	0.0490	0.0000
Ca-49	8.7200 m 0.23	2.3100E+15	82.71	3.1700	0.8697	0.0000	0.0000
Zn-69	56.400 m 1.60	1.4324E+16	79.30	0.0003	0.3216	0.0000	0.0000
Hf-180m	5.5000 h 1.82	8.2799E+16	78.34	0.9980	0.0000	0.0000	0.0000
Rb-88	17.800 m 0.56	2.9745E+15	52.18	0.6370	2.0700	0.0000	0.0000
Ga-72	14.100 h 0.07	1.3032E+17	48.10	2.7080	0.5028	0.0000	0.0000
V-52	3.7450 m 0.13	5.4786E+14	45.68	1.4450	1.0680	0.0000	0.0000
Ti-51	5.8000 m 0.52	6.8950E+14	37.12	0.3692	0.8684	0.0000	0.0000
Cu-66	5.1000 m 0.20	5.8984E+14	36.11	0.0978	1.0670	0.0000	0.0000
Nb-94m	6.2600 m 0.16	5.8854E+14	29.35	0.0117	0.0349	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4489E+18	27.54	0.0002	0.0019	0.0000	0.0000
Y-90m	3.1890 h 0.31	1.6810E+16	27.43	0.6340	0.0475	0.0000	0.0000
La-140	1.6780 d 0.01	1.8440E+17	23.83	2.3200	0.5340	0.0000	0.0000
Sm-155	22.300 m 0.90	1.6692E+15	23.37	0.1040	0.5680	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.2233E+16	22.71	0.3215	0.0674	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.5508E+17	17.44	0.0617	0.2700	0.0000	0.0000
Ba-131m	14.600 m 1.37	5.6991E+14	12.19	0.0766	0.1090	0.0000	0.0000
Np-239	2.3550 d 0.17	1.2871E+17	11.85	0.1740	0.1079	0.0000	0.0000
Al-29	6.5600 m 0.91	1.7174E+14	8.174	1.3790	0.9765	0.0000	0.0000
Zn-69m	13.760 h 0.15	2.0420E+16	7.722	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	3.1564E+16	6.262	0.4300	1.0610	0.0000	0.0000
Ar-41	1.8270 h 0.36	1.7007E+15	4.844	1.2840	0.4639	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.6575E+14	3.385	0.4320	0.0984	0.0000	0.0000
Se-81	18.450 m 0.65	1.3426E+14	2.272	0.0080	0.6107	0.0000	0.0000
Pa-233	27.000 d 0.37	2.3475E+17	1.885	0.2175	0.0664	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0259E+16	1.860	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.7936E+16	1.808	0.1089	0.1619	0.0000	0.0000
P-32	14.270 d 0.28	1.1737E+17	1.783	0.0012	0.6949	0.0000	0.0000
Y-90	2.6710 d 0.12	2.1087E+16	1.712	0.0020	0.9336	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.4366E+15	1.668	0.1570	0.2282	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1690E+17	1.361	0.0957	0.6670	0.0000	0.0000
Sr-85m	1.1270 h 0.07	2.9450E+14	1.360	0.2160	0.0140	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7259E+18	1.243	0.0016	0.0038	0.0000	0.0000
Se-81m	57.280 m 0.03	1.9288E+14	1.051	0.0182	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 637
Total activity (Ci) = 1.02365E+05

Total number of decays = 9.39544E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 13.681
Average chain length = 1.0247

Average gamma E (MeV) = 1.1116
Average beta E (MeV) = 0.65123
Average alpha E (MeV) = 6.53969E-13

Composite Exposure Rate Conversion Factor = 18.1610165 R/hr per Ci/m2
Composite ECF per FGR table = 19.0449505 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.8952322 Rem/hr per Ci/m2

Ground Source

Point in time = 42.4066658 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Si-31	2.6200 h 0.38	1.6191E+19	3.2158E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.4567E+19	2.9358E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960 h 0.01	3.9777E+19	1.3836E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	1.4888E+19	6268.	0.2786	1.4310	0.0000	0.0000
Co-60m	10.470 m 0.38	1.9761E+17	5893.	0.0066	0.0536	0.0000	0.0000
Th-233	22.300 m 0.45	9.6403E+16	1350.	0.0369	0.4043	0.0000	0.0000
Cs-134m	2.9080 h 0.10	4.4800E+17	801.7	0.0268	0.1090	0.0000	0.0000
U-239	23.470 m 0.21	5.8335E+16	776.0	0.0521	0.3947	0.0000	0.0000
Eu-154m	46.400 m 1.08	1.0264E+17	690.7	0.0842	0.0000	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.0349E+18	580.6	0.3070	0.5070	0.0000	0.0000
Cl-38	37.200 m 0.27	6.3529E+16	533.2	1.5110	1.5200	0.0000	0.0000
Ga-70	21.130 m 0.14	2.6248E+16	387.9	0.0087	0.6440	0.0000	0.0000
Ba-139	1.3840 h 0.34	6.4455E+16	242.3	0.0454	0.8990	0.0000	0.0000
Mg-27	9.4580 m 0.13	5.0776E+15	167.6	0.8914	0.7010	0.0000	0.0000
Sc-49	57.200 m 0.35	2.2890E+16	124.9	0.0026	0.8180	0.0000	0.0000
Cu-64	12.700 h 0.02	2.9490E+17	120.8	0.1920	0.0734	0.0490	0.0000
Hf-180m	5.5000 h 1.82	8.1342E+16	76.96	0.9980	0.0000	0.0000	0.0000
Zn-69	56.400 m 1.60	1.3048E+16	72.23	0.0003	0.3216	0.0000	0.0000
Ga-72	14.100 h 0.07	1.2942E+17	47.77	2.7080	0.5028	0.0000	0.0000
Ca-49	8.7200 m 0.23	1.1799E+15	42.25	3.1700	0.8697	0.0000	0.0000
Rb-88	17.800 m 0.56	2.1404E+15	37.54	0.6370	2.0700	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4484E+18	27.53	0.0002	0.0019	0.0000	0.0000
Y-90m	3.1890 h 0.31	1.6303E+16	26.60	0.6340	0.0475	0.0000	0.0000
La-140	1.6780 d 0.01	1.8395E+17	23.77	2.3200	0.5340	0.0000	0.0000
Al-28	2.2420 m 0.13	1.6411E+14	22.85	1.7790	1.2470	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.1814E+16	21.93	0.3215	0.0674	0.0000	0.0000
Sm-155	22.300 m 0.90	1.2836E+15	17.97	0.1040	0.5680	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.5475E+17	17.40	0.0617	0.2700	0.0000	0.0000
Ti-51	5.8000 m 0.52	2.5112E+14	13.52	0.3692	0.8684	0.0000	0.0000
Np-239	2.3550 d 0.17	1.4501E+17	13.35	0.1740	0.1079	0.0000	0.0000
Nb-94m	6.2600 m 0.16	2.3087E+14	11.51	0.0117	0.0349	0.0000	0.0000
Cu-66	5.1000 m 0.20	1.8702E+14	11.45	0.0978	1.0670	0.0000	0.0000
V-52	3.7450 m 0.13	1.1464E+14	9.558	1.4450	1.0680	0.0000	0.0000
Ba-131m	14.600 m 1.37	3.8155E+14	8.160	0.0766	0.1090	0.0000	0.0000
Zn-69m	13.760 h 0.15	2.0275E+16	7.668	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	3.1447E+16	6.238	0.4300	1.0610	0.0000	0.0000
Ar-41	1.8270 h 0.36	1.6122E+15	4.592	1.2840	0.4639	0.0000	0.0000
Al-29	6.5600 m 0.91	7.0313E+13	3.347	1.3790	0.9765	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.1299E+14	2.307	0.4320	0.0984	0.0000	0.0000
Pa-233	27.000 d 0.37	2.6368E+17	2.117	0.2175	0.0664	0.0000	0.0000
Se-81	18.450 m 0.65	1.1375E+14	1.925	0.0080	0.6107	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0224E+16	1.854	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.7902E+16	1.805	0.1089	0.1619	0.0000	0.0000
P-32	14.270 d 0.28	1.1733E+17	1.783	0.0012	0.6949	0.0000	0.0000
Y-90	2.6710 d 0.12	2.1562E+16	1.750	0.0020	0.9336	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.4056E+15	1.632	0.1570	0.2282	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1687E+17	1.360	0.0957	0.6670	0.0000	0.0000
Sr-85m	1.1270 h 0.07	2.7006E+14	1.247	0.2160	0.0140	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7259E+18	1.243	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8771E+17	1.003	2.0090	0.1118	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 636
Total activity (Ci) = 93845.

Total number of decays = 9.57893E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 13.948
Average chain length = 1.0247

Average gamma E (MeV) = 1.1767
Average beta E (MeV) = 0.67684
Average alpha E (MeV) = 1.03770E-12

Composite Exposure Rate Conversion Factor = 19.1535892 R/hr per Ci/m2
Composite ECF per FGR table = 20.1902561 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.7087879 Rem/hr per Ci/m2

Ground Source

Point in time = 52.9617386 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Si-31	2.6200 h 0.38	1.5455E+19	3.0696E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.3895E+19	2.8004E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960 h 0.01	3.9454E+19	1.3724E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	1.4742E+19	6207.	0.2786	1.4310	0.0000	0.0000
Co-60m	10.470 m 0.38	9.8252E+16	2930.	0.0066	0.0536	0.0000	0.0000
Th-233	22.300 m 0.45	6.9440E+16	972.2	0.0369	0.4043	0.0000	0.0000
Cs-134m	2.9080 h 0.10	4.2960E+17	768.8	0.0268	0.1090	0.0000	0.0000
Eu-154m	46.400 m 1.08	8.7671E+16	589.9	0.0842	0.0000	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.0214E+18	573.0	0.3070	0.5070	0.0000	0.0000
U-239	23.470 m 0.21	4.2712E+16	568.2	0.0521	0.3947	0.0000	0.0000
Cl-38	37.200 m 0.27	5.2187E+16	438.0	1.5110	1.5200	0.0000	0.0000
Ga-70	21.130 m 0.14	1.8566E+16	274.3	0.0087	0.6440	0.0000	0.0000
Ba-139	1.3840 h 0.34	5.9019E+16	221.9	0.0454	0.8990	0.0000	0.0000
Cu-64	12.700 h 0.02	2.9208E+17	119.7	0.1920	0.0734	0.0490	0.0000
Sc-49	57.200 m 0.35	2.0765E+16	113.3	0.0026	0.8180	0.0000	0.0000
Mg-27	9.4580 m 0.13	2.3427E+15	77.34	0.8914	0.7010	0.0000	0.0000
HF-180m	5.5000 h 1.82	7.9559E+16	75.27	0.9980	0.0000	0.0000	0.0000
Zn-69	56.400 m 1.60	1.1628E+16	64.37	0.0003	0.3216	0.0000	0.0000
Ga-72	14.100 h 0.07	1.2831E+17	47.35	2.7080	0.5028	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4478E+18	27.53	0.0002	0.0019	0.0000	0.0000
Y-90m	3.1890 h 0.31	1.5691E+16	25.61	0.6340	0.0475	0.0000	0.0000
Rb-88	17.800 m 0.56	1.4190E+15	24.89	0.6370	2.0700	0.0000	0.0000
La-140	1.6780 d 0.01	1.8339E+17	23.70	2.3200	0.5340	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.1311E+16	21.00	0.3215	0.0674	0.0000	0.0000
Ca-49	8.7200 m 0.23	5.0988E+14	18.26	3.1700	0.8697	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.5435E+17	17.36	0.0617	0.2700	0.0000	0.0000
Np-239	2.3550 d 0.17	1.6030E+17	14.76	0.1740	0.1079	0.0000	0.0000
Sm-155	22.300 m 0.90	9.2458E+14	12.95	0.1040	0.5680	0.0000	0.0000
Zn-69m	13.760 h 0.15	2.0096E+16	7.600	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	3.1301E+16	6.209	0.4300	1.0610	0.0000	0.0000
Ba-131m	14.600 m 1.37	2.3116E+14	4.944	0.0766	0.1090	0.0000	0.0000
Ar-41	1.8270 h 0.36	1.5081E+15	4.296	1.2840	0.4639	0.0000	0.0000
Ti-51	5.8000 m 0.52	7.1131E+13	3.829	0.3692	0.8684	0.0000	0.0000
Nb-94m	6.2600 m 0.16	7.1744E+13	3.578	0.0117	0.0349	0.0000	0.0000
Cu-66	5.1000 m 0.20	4.4551E+13	2.727	0.0978	1.0670	0.0000	0.0000
Pa-233	27.000 d 0.37	2.9059E+17	2.334	0.2175	0.0664	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0181E+16	1.846	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.7861E+16	1.803	0.1089	0.1619	0.0000	0.0000
Y-90	2.6710 d 0.12	2.2132E+16	1.797	0.0020	0.9336	0.0000	0.0000
P-32	14.270 d 0.28	1.1729E+17	1.782	0.0012	0.6949	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.3679E+15	1.589	0.1570	0.2282	0.0000	0.0000
Se-81	18.450 m 0.65	9.3666E+13	1.585	0.0080	0.6107	0.0000	0.0000
Xe-135m	15.290 m 0.33	7.0023E+13	1.430	0.4320	0.0984	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1684E+17	1.360	0.0957	0.6670	0.0000	0.0000
V-52	3.7450 m 0.13	1.6251E+13	1.355	1.4450	1.0680	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7259E+18	1.243	0.0016	0.0038	0.0000	0.0000
Sr-85m	1.1270 h 0.07	2.4236E+14	1.119	0.2160	0.0140	0.0000	0.0000
Al-29	6.5600 m 0.91	2.3050E+13	1.097	1.3790	0.9765	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8768E+17	1.003	2.0090	0.1118	0.0000	0.0000
Al-28	2.2420 m 0.13	6.2795E+12	0.8745	1.7790	1.2470	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155340D+20

Total number of nuclides = 633
Total activity (Ci) = 86716.

Total number of decays = 9.78996E+19
Asympt number of decays = 6.86756E+20
Percent of decays = 14.255
Average chain length = 1.0247

Average gamma E (MeV) = 1.2365
Average beta E (MeV) = 0.69828
Average alpha E (MeV) = 1.61204E-12

Composite Exposure Rate Conversion Factor = 20.0616779 R/hr per Ci/m2
Composite ECF per FGR table = 21.2279873 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.4561729 Rem/hr per Ci/m2

Ground Source

Point in time = 1.10240090 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Si-31	2.6200	h	0.38	1.4582E+19	2.8963E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	1.3099E+19	2.6400E+04	1.6910	0.8309	0.0000
Na-24	14.960	h	0.01	3.9055E+19	1.3585E+04	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	1.4561E+19	6131.	0.2786	1.4310	0.0000
Co-60m	10.470	m	0.38	4.1051E+16	1224.	0.0066	0.0536	0.0000
Cs-134m	2.9080	h	0.10	4.0768E+17	729.5	0.0268	0.1090	0.0000
Th-233	22.300	m	0.45	4.6095E+16	645.4	0.0369	0.4043	0.0000
Eu-152m	9.2750	h	0.10	1.0047E+18	563.7	0.3070	0.5070	0.0000
Eu-154m	46.400	m	1.08	7.2000E+16	484.5	0.0842	0.0000	0.0000
U-239	23.470	m	0.21	2.8938E+16	385.0	0.0521	0.3947	0.0000
Cl-38	37.200	m	0.27	4.0821E+16	342.6	1.5110	1.5200	0.0000
Ba-139	1.3840	h	0.34	5.2869E+16	198.8	0.0454	0.8990	0.0000
Ga-70	21.130	m	0.14	1.2048E+16	178.0	0.0087	0.6440	0.0000
Cu-64	12.700	h	0.02	2.8860E+17	118.3	0.1920	0.0734	0.0490
Sc-49	57.200	m	0.35	1.8001E+16	98.26	0.0026	0.8180	0.0000
Hf-180m	5.5000	h	1.82	7.7386E+16	73.22	0.9980	0.0000	0.0000
Zn-69	56.400	m	1.60	1.0093E+16	55.88	0.0003	0.3216	0.0000
Ga-72	14.100	h	0.07	1.2693E+17	46.85	2.7080	0.5028	0.0000
Mg-27	9.4580	m	0.13	8.9154E+14	29.43	0.8914	0.7010	0.0000
Ar-37	35.030	d	0.09	4.4470E+18	27.53	0.0002	0.0019	0.0000
Y-90m	3.1890	h	0.31	1.4960E+16	24.41	0.6340	0.0475	0.0000
La-140	1.6780	d	0.01	1.8270E+17	23.61	2.3200	0.5340	0.0000
Sr-87m	2.8030	h	0.11	1.0713E+16	19.89	0.3215	0.0674	0.0000
Sm-153	1.9280	d	0.01	1.5384E+17	17.30	0.0617	0.2700	0.0000
Np-239	2.3550	d	0.17	1.7362E+17	15.99	0.1740	0.1079	0.0000
Rb-88	17.800	m	0.56	8.4928E+14	14.90	0.6370	2.0700	0.0000
Sm-155	22.300	m	0.90	6.1375E+14	8.593	0.1040	0.5680	0.0000
Zn-69m	13.760	h	0.15	1.9875E+16	7.516	0.4161	0.0226	0.0000
Ca-49	8.7200	m	0.23	1.7881E+14	6.402	3.1700	0.8697	0.0000
As-76	1.0930	d	0.34	3.1120E+16	6.174	0.4300	1.0610	0.0000
Ar-41	1.8270	h	0.36	1.3875E+15	3.952	1.2840	0.4639	0.0000
Ba-131m	14.600	m	1.37	1.2363E+14	2.644	0.0766	0.1090	0.0000
Pa-233	27.000	d	0.37	3.1386E+17	2.520	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	2.2810E+16	1.852	0.0020	0.9336	0.0000
Ba-135m	1.1960	d	0.70	1.0127E+16	1.836	0.0600	0.2070	0.0000
Sc-47	3.3510	d	0.06	2.7809E+16	1.799	0.1089	0.1619	0.0000
P-32	14.270	d	0.28	1.1724E+17	1.781	0.0012	0.6949	0.0000
Kr-85m	4.4810	h	0.18	1.3222E+15	1.535	0.1570	0.2282	0.0000
Rb-86	18.630	d	0.11	1.1680E+17	1.359	0.0957	0.6670	0.0000
Se-81	18.450	m	0.65	7.4777E+13	1.265	0.0080	0.6107	0.0000
Fe-55	2.7351	y	0.80	5.7258E+18	1.243	0.0016	0.0038	0.0000
Sc-46	83.780	d	0.02	3.8765E+17	1.003	2.0090	0.1118	0.0000
Sr-85m	1.1270	h	0.07	2.1173E+14	0.9776	0.2160	0.0140	0.0000
Fe-59	44.490	d	0.02	1.7467E+17	0.8513	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0668E+17	0.8347	0.0328	0.0031	0.0000
Nb-94m	6.2600	m	0.16	1.6668E+13	0.8313	0.0117	0.0349	0.0000
Xe-135	9.1390	h	0.22	1.3979E+15	0.7960	0.2490	0.3190	0.0000
Ti-51	5.8000	m	0.52	1.4719E+13	0.7924	0.3692	0.8684	0.0000
Xe-135m	15.290	m	0.33	3.8522E+13	0.7866	0.4320	0.0984	0.0000
Se-81m	57.280	m	0.03	1.3066E+14	0.7122	0.0182	0.0002	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155353D+20

Total number of nuclides = 628
Total activity (Ci) = 80461.

Total number of decays = 1.00341E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 14.611
Average chain length = 1.0247

Average gamma E (MeV) = 1.2879
Average beta E (MeV) = 0.71311
Average alpha E (MeV) = 2.45725E-12

Composite Exposure Rate Conversion Factor = 20.8268852 R/hr per Ci/m2
Composite ECF per FGR table = 22.1079979 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0983849 Rem/hr per Ci/m2

Ground Source

Point in time = 1.37679005 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Si-31	2.6200 h 0.38	1.3561E+19	2.6935E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.2169E+19	2.4525E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960 h 0.01	3.8561E+19	1.3414E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	1.4339E+19	6037.	0.2786	1.4310	0.0000	0.0000
Cs-134m	2.9080 h 0.10	3.8187E+17	683.4	0.0268	0.1090	0.0000	0.0000
Eu-152m	9.2750 h 0.10	9.8433E+17	552.3	0.3070	0.5070	0.0000	0.0000
Co-60m	10.470 m 0.38	1.3803E+16	411.6	0.0066	0.0536	0.0000	0.0000
Th-233	22.300 m 0.45	2.7632E+16	386.9	0.0369	0.4043	0.0000	0.0000
Eu-154m	46.400 m 1.08	5.6302E+16	378.9	0.0842	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	3.0037E+16	252.1	1.5110	1.5200	0.0000	0.0000
U-239	23.470 m 0.21	1.7795E+16	236.7	0.0521	0.3947	0.0000	0.0000
Ba-139	1.3840 h 0.34	4.6081E+16	173.3	0.0454	0.8990	0.0000	0.0000
Cu-64	12.700 h 0.02	2.8431E+17	116.5	0.1920	0.0734	0.0490	0.0000
Ga-70	21.130 m 0.14	7.0207E+15	103.7	0.0087	0.6440	0.0000	0.0000
Sc-49	57.200 m 0.35	1.4861E+16	81.12	0.0026	0.8180	0.0000	0.0000
Hf-180m	5.5000 h 1.82	7.4756E+16	70.73	0.9980	0.0000	0.0000	0.0000
Zn-69	56.400 m 1.60	8.4912E+15	47.01	0.0003	0.3216	0.0000	0.0000
Ga-72	14.100 h 0.07	1.2523E+17	46.22	2.7080	0.5028	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4460E+18	27.52	0.0002	0.0019	0.0000	0.0000
La-140	1.6780 d 0.01	1.8184E+17	23.50	2.3200	0.5340	0.0000	0.0000
Y-90m	3.1890 h 0.31	1.4093E+16	23.00	0.6340	0.0475	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.0010E+16	18.58	0.3215	0.0674	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.5321E+17	17.23	0.0617	0.2700	0.0000	0.0000
Np-239	2.3550 d 0.17	1.8416E+17	16.96	0.1740	0.1079	0.0000	0.0000
Mg-27	9.4580 m 0.13	2.6677E+14	8.807	0.8914	0.7010	0.0000	0.0000
Rb-88	17.800 m 0.56	4.4733E+14	7.847	0.6370	2.0700	0.0000	0.0000
Zn-69m	13.760 h 0.15	1.9602E+16	7.413	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	3.0895E+16	6.129	0.4300	1.0610	0.0000	0.0000
Sm-155	22.300 m 0.90	3.6792E+14	5.151	0.1040	0.5680	0.0000	0.0000
Ar-41	1.8270 h 0.36	1.2503E+15	3.561	1.2840	0.4639	0.0000	0.0000
Pa-233	27.000 d 0.37	3.3223E+17	2.668	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710 d 0.12	2.3607E+16	1.916	0.0020	0.9336	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0060E+16	1.824	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.7744E+16	1.795	0.1089	0.1619	0.0000	0.0000
P-32	14.270 d 0.28	1.1717E+17	1.780	0.0012	0.6949	0.0000	0.0000
Ca-49	8.7200 m 0.23	4.8311E+13	1.730	3.1700	0.8697	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.2672E+15	1.472	0.1570	0.2282	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1675E+17	1.359	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7258E+18	1.243	0.0016	0.0038	0.0000	0.0000
Ba-131m	14.600 m 1.37	5.6581E+13	1.210	0.0766	0.1090	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8762E+17	1.003	2.0090	0.1118	0.0000	0.0000
Se-81	18.450 m 0.65	5.7698E+13	0.9764	0.0080	0.6107	0.0000	0.0000
Fe-59	44.490 d 0.02	1.7464E+17	0.8511	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710 d 0.01	1.0665E+17	0.8345	0.0328	0.0031	0.0000	0.0000
Sr-85m	1.1270 h 0.07	1.7885E+14	0.8258	0.2160	0.0140	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.3890E+15	0.7909	0.2490	0.3190	0.0000	0.0000
Hf-181	42.380 d 0.14	1.3158E+17	0.6732	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701 y 0.02	5.8379E+18	0.6576	2.5030	0.0964	0.0000	0.0000
Co-58m	8.9000 h 1.12	1.1166E+15	0.6529	0.0019	0.0208	0.0000	0.0000
Se-81m	57.280 m 0.03	1.0706E+14	0.5835	0.0182	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 625
Total activity (Ci) = 74646.

Total number of decays = 1.03171E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 15.023
Average chain length = 1.0247

Average gamma E (MeV) = 1.3329
Average beta E (MeV) = 0.72211
Average alpha E (MeV) = 3.68679E-12

Composite Exposure Rate Conversion Factor = 21.4787025 R/hr per Ci/m2
Composite ECF per FGR table = 22.8677654 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.6610603 Rem/hr per Ci/m2

Ground Source

Point in time = 1.71947491 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)				
						gamma	beta(-)	beta(+)	alpha	
Si-31	2.6200		h	0.38	1.2386E+19	2.4600E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820		h	0.19	1.1099E+19	2.2369E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960		h	0.01	3.7954E+19	1.3202E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360		h	0.02	1.4066E+19	5922.	0.2786	1.4310	0.0000	0.0000
Cs-134m	2.9080		h	0.10	3.5192E+17	629.8	0.0268	0.1090	0.0000	0.0000
Eu-152m	9.2750		h	0.10	9.5944E+17	538.3	0.3070	0.5070	0.0000	0.0000
Eu-154m	46.400		m	1.08	4.1412E+16	278.7	0.0842	0.0000	0.0000	0.0000
Th-233	22.300		m	0.45	1.4583E+16	204.2	0.0369	0.4043	0.0000	0.0000
Cl-38	37.200		m	0.27	2.0477E+16	171.9	1.5110	1.5200	0.0000	0.0000
Ba-139	1.3840		h	0.34	3.8814E+16	145.9	0.0454	0.8990	0.0000	0.0000
U-239	23.470		m	0.21	9.6959E+15	129.0	0.0521	0.3947	0.0000	0.0000
Cu-64	12.700		h	0.02	2.7904E+17	114.3	0.1920	0.0734	0.0490	0.0000
Co-60m	10.470		m	0.38	3.5384E+15	105.5	0.0066	0.0536	0.0000	0.0000
Hf-180m	5.5000		h	1.82	7.1596E+16	67.74	0.9980	0.0000	0.0000	0.0000
Sc-49	57.200		m	0.35	1.1617E+16	63.41	0.0026	0.8180	0.0000	0.0000
Ga-70	21.130		m	0.14	3.5765E+15	52.85	0.0087	0.6440	0.0000	0.0000
Ga-72	14.100		h	0.07	1.2314E+17	45.45	2.7080	0.5028	0.0000	0.0000
Zn-69	56.400		m	1.60	6.8914E+15	38.15	0.0003	0.3216	0.0000	0.0000
Ar-37	35.030		d	0.09	4.4447E+18	27.51	0.0002	0.0019	0.0000	0.0000
La-140	1.6780		d	0.01	1.8077E+17	23.36	2.3200	0.5340	0.0000	0.0000
Y-90m	3.1890		h	0.31	1.3082E+16	21.35	0.6340	0.0475	0.0000	0.0000
Np-239	2.3550		d	0.17	1.9147E+17	17.63	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280		d	0.01	1.5242E+17	17.14	0.0617	0.2700	0.0000	0.0000
Sr-87m	2.8030		h	0.11	9.1967E+15	17.07	0.3215	0.0674	0.0000	0.0000
Zn-69m	13.760		h	0.15	1.9267E+16	7.286	0.4161	0.0226	0.0000	0.0000
As-76	1.0930		d	0.34	3.0617E+16	6.074	0.4300	1.0610	0.0000	0.0000
Rb-88	17.800		m	0.56	2.0086E+14	3.523	0.6370	2.0700	0.0000	0.0000
Ar-41	1.8270		h	0.36	1.0979E+15	3.127	1.2840	0.4639	0.0000	0.0000
Pa-233	27.000		d	0.37	3.4515E+17	2.772	0.2175	0.0664	0.0000	0.0000
Sm-155	22.300		m	0.90	1.9418E+14	2.719	0.1040	0.5680	0.0000	0.0000
Y-90	2.6710		d	0.12	2.4530E+16	1.991	0.0020	0.9336	0.0000	0.0000
Mg-27	9.4580		m	0.13	5.9118E+13	1.952	0.8914	0.7010	0.0000	0.0000
Ba-135m	1.1960		d	0.70	9.9770E+15	1.809	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510		d	0.06	2.7663E+16	1.790	0.1089	0.1619	0.0000	0.0000
P-32	14.270		d	0.28	1.1709E+17	1.779	0.0012	0.6949	0.0000	0.0000
Kr-85m	4.4810		h	0.18	1.2018E+15	1.396	0.1570	0.2282	0.0000	0.0000
Rb-86	18.630		d	0.11	1.1669E+17	1.358	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351		y	0.80	5.7257E+18	1.243	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780		d	0.02	3.8757E+17	1.003	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490		d	0.02	1.7460E+17	0.8510	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710		d	0.01	1.0661E+17	0.8342	0.0328	0.0031	0.0000	0.0000
Xe-135	9.1390		h	0.22	1.3642E+15	0.7768	0.2490	0.3190	0.0000	0.0000
Se-81	18.450		m	0.65	4.2809E+13	0.7245	0.0080	0.6107	0.0000	0.0000
Hf-181	42.380		d	0.14	1.3155E+17	0.6730	0.5180	0.1204	0.0000	0.0000
Sr-85m	1.1270		h	0.07	1.4486E+14	0.6689	0.2160	0.0140	0.0000	0.0000
Co-60	5.2701		y	0.02	5.8481E+18	0.6588	2.5030	0.0964	0.0000	0.0000
Co-58m	8.9000		h	1.12	1.0872E+15	0.6357	0.0019	0.0208	0.0000	0.0000
Ca-45	163.000		d	0.61	3.7119E+17	0.4938	0.0000	0.0769	0.0000	0.0000
Mn-54	312.200		d	0.01	6.6299E+17	0.4605	0.8359	0.0034	0.0000	0.0000
Ba-131m	14.600		m	1.37	2.1317E+13	0.4559	0.0766	0.1090	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 618
Total activity (Ci) = 68855.

Total number of decays = 1.06442E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 15.499
Average chain length = 1.0247

Average gamma E (MeV) = 1.3764
Average beta E (MeV) = 0.72734
Average alpha E (MeV) = 5.47204E-12

Composite Exposure Rate Conversion Factor = 22.0902576 R/hr per Ci/m2
Composite ECF per FGR table = 23.5913277 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 17.2045574 Rem/hr per Ci/m2

Ground Source

Point in time = 2.14745688 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Si-31	2.6200	h	0.38	1.1060E+19	2.1967E+04	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.8945E+18	1.9941E+04	1.6910	0.8309	0.0000	0.0000
Na-24	14.960	h	0.01	3.7209E+19	1.2943E+04	4.1240	0.5546	0.0000	0.0000
K-42	12.360	h	0.02	1.3733E+19	5782.	0.2786	1.4310	0.0000	0.0000
Cs-134m	2.9080	h	0.10	3.1779E+17	568.7	0.0268	0.1090	0.0000	0.0000
Eu-152m	9.2750	h	0.10	9.2924E+17	521.4	0.3070	0.5070	0.0000	0.0000
Eu-154m	46.400	m	1.08	2.8218E+16	189.9	0.0842	0.0000	0.0000	0.0000
Ba-139	1.3840	h	0.34	3.1325E+16	117.8	0.0454	0.8990	0.0000	0.0000
Cu-64	12.700	h	0.02	2.7260E+17	111.7	0.1920	0.0734	0.0490	0.0000
Cl-38	37.200	m	0.27	1.2690E+16	106.5	1.5110	1.5200	0.0000	0.0000
Th-233	22.300	m	0.45	6.5648E+15	91.92	0.0369	0.4043	0.0000	0.0000
Hf-180m	5.5000	h	1.82	6.7836E+16	64.18	0.9980	0.0000	0.0000	0.0000
U-239	23.470	m	0.21	4.5418E+15	60.42	0.0521	0.3947	0.0000	0.0000
Sc-49	57.200	m	0.35	8.5172E+15	46.49	0.0026	0.8180	0.0000	0.0000
Ga-72	14.100	h	0.07	1.2058E+17	44.50	2.7080	0.5028	0.0000	0.0000
Zn-69	56.400	m	1.60	5.3784E+15	29.77	0.0003	0.3216	0.0000	0.0000
Ar-37	35.030	d	0.09	4.4431E+18	27.50	0.0002	0.0019	0.0000	0.0000
La-140	1.6780	d	0.01	1.7944E+17	23.19	2.3200	0.5340	0.0000	0.0000
Ga-70	21.130	m	0.14	1.5403E+15	22.76	0.0087	0.6440	0.0000	0.0000
Y-90m	3.1890	h	0.31	1.1920E+16	19.45	0.6340	0.0475	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4640E+14	19.28	0.0066	0.0536	0.0000	0.0000
Np-239	2.3550	d	0.17	1.9561E+17	18.01	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280	d	0.01	1.5145E+17	17.03	0.0617	0.2700	0.0000	0.0000
Sr-87m	2.8030	h	0.11	8.2731E+15	15.36	0.3215	0.0674	0.0000	0.0000
Zn-69m	13.760	h	0.15	1.8856E+16	7.131	0.4161	0.0226	0.0000	0.0000
As-76	1.0930	d	0.34	3.0273E+16	6.005	0.4300	1.0610	0.0000	0.0000
Pa-233	27.000	d	0.37	3.5301E+17	2.835	0.2175	0.0664	0.0000	0.0000
Ar-41	1.8270	h	0.36	9.3334E+14	2.658	1.2840	0.4639	0.0000	0.0000
Y-90	2.6710	d	0.12	2.5576E+16	2.076	0.0020	0.9336	0.0000	0.0000
Ba-135m	1.1960	d	0.70	9.8744E+15	1.790	0.0600	0.2070	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.7563E+16	1.783	0.1089	0.1619	0.0000	0.0000
P-32	14.270	d	0.28	1.1699E+17	1.778	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	1.1661E+17	1.357	0.0957	0.6670	0.0000	0.0000
Kr-85m	4.4810	h	0.18	1.1248E+15	1.306	0.1570	0.2282	0.0000	0.0000
Rb-88	17.800	m	0.56	7.3896E+13	1.296	0.6370	2.0700	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.7256E+18	1.243	0.0016	0.0038	0.0000	0.0000
Sm-155	22.300	m	0.90	8.7409E+13	1.224	0.1040	0.5680	0.0000	0.0000
Sc-46	83.780	d	0.02	3.8751E+17	1.003	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490	d	0.02	1.7456E+17	0.8507	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0656E+17	0.8338	0.0328	0.0031	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.3254E+15	0.7547	0.2490	0.3190	0.0000	0.0000
Hf-181	42.380	d	0.14	1.3151E+17	0.6728	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8510E+18	0.6591	2.5030	0.0964	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.0516E+15	0.6148	0.0019	0.0208	0.0000	0.0000
Sr-85m	1.1270	h	0.07	1.1134E+14	0.5141	0.2160	0.0140	0.0000	0.0000
Se-81	18.450	m	0.65	3.0261E+13	0.5121	0.0080	0.6107	0.0000	0.0000
Ca-45	163.00	d	0.61	3.7116E+17	0.4937	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.6297E+17	0.4604	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70	d	0.35	2.2148E+17	0.4187	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 617
Total activity (Ci) = 62793.

Total number of decays = 1.10189E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 16.045
Average chain length = 1.0247

Average gamma E (MeV) = 1.4240
Average beta E (MeV) = 0.73081
Average alpha E (MeV) = 8.08098E-12

Composite Exposure Rate Conversion Factor = 22.7460918 R/hr per Ci/m2
Composite ECF per FGR table = 24.3753777 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 17.7994633 Rem/hr per Ci/m2

Ground Source

Point in time = 2.68196177 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Si-31	2.6200	h	0.38	9.6013E+18	1.9070E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	8.5719E+18	1.7276E+04	1.6910	0.8309	0.0000
Na-24	14.960	h	0.01	3.6299E+19	1.2626E+04	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	1.3327E+19	5611.	0.2786	1.4310	0.0000
Eu-152m	9.2750	h	0.10	8.9285E+17	500.9	0.3070	0.5070	0.0000
Cs-134m	2.9080	h	0.10	2.7977E+17	500.7	0.0268	0.1090	0.0000
Eu-154m	46.400	m	1.08	1.7477E+16	117.6	0.0842	0.0000	0.0000
Cu-64	12.700	h	0.02	2.6476E+17	108.5	0.1920	0.0734	0.0490
Ba-139	1.3840	h	0.34	2.3968E+16	90.12	0.0454	0.8990	0.0000
Hf-180m	5.5000	h	1.82	6.3417E+16	60.00	0.9980	0.0000	0.0000
Cl-38	37.200	m	0.27	6.9816E+15	58.60	1.5110	1.5200	0.0000
Ga-72	14.100	h	0.07	1.1745E+17	43.35	2.7080	0.5028	0.0000
Th-233	22.300	m	0.45	2.4227E+15	33.92	0.0369	0.4043	0.0000
Sc-49	57.200	m	0.35	5.7754E+15	31.53	0.0026	0.8180	0.0000
Ar-37	35.030	d	0.09	4.4412E+18	27.49	0.0002	0.0019	0.0000
U-239	23.470	m	0.21	1.7615E+15	23.43	0.0521	0.3947	0.0000
La-140	1.6780	d	0.01	1.7780E+17	22.97	2.3200	0.5340	0.0000
Zn-69	56.400	m	1.60	4.0399E+15	22.37	0.0003	0.3216	0.0000
Np-239	2.3550	d	0.17	1.9710E+17	18.15	0.1740	0.1079	0.0000
Y-90m	3.1890	h	0.31	1.0612E+16	17.32	0.6340	0.0475	0.0000
Sm-153	1.9280	d	0.01	1.5024E+17	16.90	0.0617	0.2700	0.0000
Sr-87m	2.8030	h	0.11	7.2487E+15	13.46	0.3215	0.0674	0.0000
Ga-70	21.130	m	0.14	5.3793E+14	7.949	0.0087	0.6440	0.0000
Zn-69m	13.760	h	0.15	1.8355E+16	6.942	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	2.9848E+16	5.921	0.4300	1.0610	0.0000
Pa-233	27.000	d	0.37	3.5695E+17	2.867	0.2175	0.0664	0.0000
Co-60m	10.470	m	0.38	7.7344E+13	2.306	0.0066	0.0536	0.0000
Ar-41	1.8270	h	0.36	7.6203E+14	2.170	1.2840	0.4639	0.0000
Y-90	2.6710	d	0.12	2.6732E+16	2.170	0.0020	0.9336	0.0000
P-32	14.270	d	0.28	1.1686E+17	1.776	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.7439E+16	1.775	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	9.7478E+15	1.767	0.0600	0.2070	0.0000
Rb-86	18.630	d	0.11	1.1652E+17	1.356	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7256E+18	1.243	0.0016	0.0038	0.0000
Kr-85m	4.4810	h	0.18	1.0356E+15	1.203	0.1570	0.2282	0.0000
Sc-46	83.780	d	0.02	3.8744E+17	1.003	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.7450E+17	0.8504	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0650E+17	0.8334	0.0328	0.0031	0.0000
Xe-135	9.1390	h	0.22	1.2744E+15	0.7257	0.2490	0.3190	0.0000
Hf-181	42.380	d	0.14	1.3146E+17	0.6726	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8515E+18	0.6591	2.5030	0.0964	0.0000
Co-58m	8.9000	h	1.12	1.0087E+15	0.5898	0.0019	0.0208	0.0000
Ca-45	163.00	d	0.61	3.7112E+17	0.4937	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6294E+17	0.4604	0.8359	0.0034	0.0000
Sm-155	22.300	m	0.90	3.2258E+13	0.4517	0.1040	0.5680	0.0000
Ta-182	114.70	d	0.35	2.2145E+17	0.4186	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
Sb-122	2.7000	d	0.37	4.8826E+15	0.3921	0.4340	0.5660	0.0000
S-35	87.310	d	0.18	1.5616E+17	0.3878	0.0000	0.0486	0.0000
Rb-88	17.800	m	0.56	2.1196E+13	0.3718	0.6370	2.0700	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 612
Total activity (Ci) = 56341.

Total number of decays = 1.14424E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 16.662
Average chain length = 1.0247

Average gamma E (MeV) = 1.4810
Average beta E (MeV) = 0.73388
Average alpha E (MeV) = 1.19429E-11

Composite Exposure Rate Conversion Factor = 23.5245743 R/hr per Ci/m2
Composite ECF per FGR table = 25.3103924 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 18.5129528 Rem/hr per Ci/m2

Ground Source

Point in time = 3.34950924 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Si-31	2.6200	h	0.38	8.0470E+18	1.5983E+04	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	7.1655E+18	1.4441E+04	1.6910	0.8309	0.0000
Na-24	14.960	h	0.01	3.5193E+19	1.2242E+04	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	1.2837E+19	5405.	0.2786	1.4310	0.0000
Eu-152m	9.2750	h	0.10	8.4940E+17	476.6	0.3070	0.5070	0.0000
Cs-134m	2.9080	h	0.10	2.3862E+17	427.0	0.0268	0.1090	0.0000
Cu-64	12.700	h	0.02	2.5529E+17	104.6	0.1920	0.0734	0.0490
Eu-154m	46.400	m	1.08	9.6076E+15	64.65	0.0842	0.0000	0.0000
Ba-139	1.3840	h	0.34	1.7157E+16	64.51	0.0454	0.8990	0.0000
Hf-180m	5.5000	h	1.82	5.8300E+16	55.16	0.9980	0.0000	0.0000
Ga-72	14.100	h	0.07	1.1366E+17	41.95	2.7080	0.5028	0.0000
Cl-38	37.200	m	0.27	3.3101E+15	27.78	1.5110	1.5200	0.0000
Ar-37	35.030	d	0.09	4.4387E+18	27.47	0.0002	0.0019	0.0000
La-140	1.6780	d	0.01	1.7577E+17	22.71	2.3200	0.5340	0.0000
Sc-49	57.200	m	0.35	3.5547E+15	19.40	0.0026	0.8180	0.0000
Np-239	2.3550	d	0.17	1.9671E+17	18.11	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.4875E+17	16.73	0.0617	0.2700	0.0000
Zn-69	56.400	m	1.60	2.9480E+15	16.32	0.0003	0.3216	0.0000
Y-90m	3.1890	h	0.31	9.1791E+15	14.98	0.6340	0.0475	0.0000
Yr-87m	2.8030	h	0.11	6.1457E+15	11.41	0.3215	0.0674	0.0000
Th-233	22.300	m	0.45	6.9762E+14	9.768	0.0369	0.4043	0.0000
U-239	23.470	m	0.21	5.3971E+14	7.180	0.0521	0.3947	0.0000
Zn-69m	13.760	h	0.15	1.7748E+16	6.712	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	2.9326E+16	5.818	0.4300	1.0610	0.0000
Pa-233	27.000	d	0.37	3.5842E+17	2.878	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	2.7968E+16	2.270	0.0020	0.9336	0.0000
Ga-70	21.130	m	0.14	1.4458E+14	2.136	0.0087	0.6440	0.0000
P-32	14.270	d	0.28	1.1671E+17	1.773	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.7284E+16	1.765	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	9.5919E+15	1.739	0.0600	0.2070	0.0000
Ar-41	1.8270	h	0.36	5.9154E+14	1.685	1.2840	0.4639	0.0000
Rb-86	18.630	d	0.11	1.1640E+17	1.355	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7254E+18	1.243	0.0016	0.0038	0.0000
Kr-85m	4.4810	h	0.18	9.3396E+14	1.085	0.1570	0.2282	0.0000
Sc-46	83.780	d	0.02	3.8735E+17	1.002	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.7442E+17	0.8501	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0643E+17	0.8328	0.0328	0.0031	0.0000
Xe-135	9.1390	h	0.22	1.2120E+15	0.6901	0.2490	0.3190	0.0000
Hf-181	42.380	d	0.14	1.3140E+17	0.6723	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8515E+18	0.6591	2.5030	0.0964	0.0000
Co-58m	8.9000	h	1.12	9.5759E+14	0.5599	0.0019	0.0208	0.0000
Ca-45	163.00	d	0.61	3.7108E+17	0.4936	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6289E+17	0.4604	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.2141E+17	0.4186	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
Sb-122	2.7000	d	0.37	4.8479E+15	0.3893	0.4340	0.5660	0.0000
S-35	87.310	d	0.18	1.5613E+17	0.3877	0.0000	0.0486	0.0000
Ni-65	2.5200	h	0.04	1.1976E+14	0.2473	0.5583	0.6276	0.0000
Sr-85m	1.1270	h	0.07	5.3157E+13	0.2454	0.2160	0.0140	0.0000
Cs-134	2.0650	y	0.03	8.2169E+17	0.2362	1.5500	0.1640	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 607
Total activity (Ci) = 49538.

Total number of decays = 1.19122E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 17.346
Average chain length = 1.0247

Average gamma E (MeV) = 1.5528
Average beta E (MeV) = 0.73725
Average alpha E (MeV) = 1.77644E-11

Composite Exposure Rate Conversion Factor = 24.4997368 R/hr per Ci/m2
Composite ECF per FGR table = 26.4833241 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 19.4105892 Rem/hr per Ci/m2

Ground Source

Point in time = 4.18320704 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Si-31	2.6200	h	0.38	6.4542E+18	1.2819E+04	0.0018	0.5952	0.0000
Na-24	14.960	h	0.01	3.3860E+19	1.1778E+04	4.1240	0.5546	0.0000
Mn-56	2.5820	h	0.19	5.7286E+18	1.1546E+04	1.6910	0.8309	0.0000
K-42	12.360	h	0.02	1.2251E+19	5158.	0.2786	1.4310	0.0000
Eu-152m	9.2750	h	0.10	7.9809E+17	447.8	0.3070	0.5070	0.0000
Cs-134m	2.9080	h	0.10	1.9562E+17	350.0	0.0268	0.1090	0.0000
Cu-64	12.700	h	0.02	2.4394E+17	99.95	0.1920	0.0734	0.0490
Hf-180m	5.5000	h	1.82	5.2486E+16	49.66	0.9980	0.0000	0.0000
Ba-139	1.3840	h	0.34	1.1301E+16	42.49	0.0454	0.8990	0.0000
Ga-72	14.100	h	0.07	1.0909E+17	40.26	2.7080	0.5028	0.0000
Eu-154m	46.400	m	1.08	4.5508E+15	30.62	0.0842	0.0000	0.0000
Ar-37	35.030	d	0.09	4.4357E+18	27.46	0.0002	0.0019	0.0000
La-140	1.6780	d	0.01	1.7326E+17	22.39	2.3200	0.5340	0.0000
Np-239	2.3550	d	0.17	1.9512E+17	17.96	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.4690E+17	16.52	0.0617	0.2700	0.0000
Y-90m	3.1890	h	0.31	7.6578E+15	12.50	0.6340	0.0475	0.0000
Zn-69	56.400	m	1.60	2.1381E+15	11.84	0.0003	0.3216	0.0000
Cl-38	37.200	m	0.27	1.3033E+15	10.94	1.5110	1.5200	0.0000
Sc-49	57.200	m	0.35	1.9389E+15	10.58	0.0026	0.8180	0.0000
Sr-87m	2.8030	h	0.11	5.0008E+15	9.284	0.3215	0.0674	0.0000
Zn-69m	13.760	h	0.15	1.7018E+16	6.436	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	2.8687E+16	5.691	0.4300	1.0610	0.0000
Pa-233	27.000	d	0.37	3.5865E+17	2.880	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	2.9231E+16	2.373	0.0020	0.9336	0.0000
Th-233	22.300	m	0.45	1.4736E+14	2.063	0.0369	0.4043	0.0000
P-32	14.270	d	0.28	1.1651E+17	1.770	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.7091E+16	1.753	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	9.4007E+15	1.704	0.0600	0.2070	0.0000
U-239	23.470	m	0.21	1.2319E+14	1.639	0.0521	0.3947	0.0000
Rb-86	18.630	d	0.11	1.1625E+17	1.353	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7253E+18	1.243	0.0016	0.0038	0.0000
Ar-41	1.8270	h	0.36	4.3114E+14	1.228	1.2840	0.4639	0.0000
Sc-46	83.780	d	0.02	3.8724E+17	1.002	2.0090	0.1118	0.0000
Kr-85m	4.4810	h	0.18	8.2096E+14	0.9534	0.1570	0.2282	0.0000
Fe-59	44.490	d	0.02	1.7433E+17	0.8496	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0634E+17	0.8321	0.0328	0.0031	0.0000
Hf-181	42.380	d	0.14	1.3133E+17	0.6719	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8515E+18	0.6591	2.5030	0.0964	0.0000
Xe-135	9.1390	h	0.22	1.1378E+15	0.6478	0.2490	0.3190	0.0000
Co-58m	8.9000	h	1.12	8.9739E+14	0.5247	0.0019	0.0208	0.0000
Ca-45	163.00	d	0.61	3.7102E+17	0.4935	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6284E+17	0.4603	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.2137E+17	0.4185	1.2910	0.2070	0.0000
Ga-70	21.130	m	0.14	2.8020E+13	0.4140	0.0087	0.6440	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5608E+17	0.3876	0.0000	0.0486	0.0000
Sb-122	2.7000	d	0.37	4.8048E+15	0.3859	0.4340	0.5660	0.0000
Cs-134	2.0650	y	0.03	8.6467E+17	0.2486	1.5500	0.1640	0.0000
Ba-133m	1.5910	d	0.79	1.5636E+15	0.2131	0.0668	0.2190	0.0000
Ni-65	2.5200	h	0.04	9.5216E+13	0.1966	0.5583	0.6276	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 601
Total activity (Ci) = 42542.

Total number of decays = 1.24221E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 18.088
Average chain length = 1.0247

Average gamma E (MeV) = 1.6451
Average beta E (MeV) = 0.74129
Average alpha E (MeV) = 2.67349E-11

Composite Exposure Rate Conversion Factor = 25.7502232 R/hr per Ci/m2
Composite ECF per FGR table = 27.9875031 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 20.5633755 Rem/hr per Ci/m2

Ground Source

Point in time = 5.22441292 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	3.2265E+19	1.1223E+04	4.1240	0.5546	0.0000
Si-31	2.6200	h	0.38	4.9002E+18	9733.	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	4.3317E+18	8730.	1.6910	0.8309	0.0000
K-42	12.360	h	0.02	1.1556E+19	4865.	0.2786	1.4310	0.0000
Eu-152m	9.2750	h	0.10	7.3835E+17	414.3	0.3070	0.5070	0.0000
Cs-134m	2.9080	h	0.10	1.5262E+17	273.1	0.0268	0.1090	0.0000
Cu-64	12.700	h	0.02	2.3046E+17	94.43	0.1920	0.0734	0.0490
Hf-180m	5.5000	h	1.82	4.6031E+16	43.55	0.9980	0.0000	0.0000
Ga-72	14.100	h	0.07	1.0365E+17	38.25	2.7080	0.5028	0.0000
Ar-37	35.030	d	0.09	4.4319E+18	27.43	0.0002	0.0019	0.0000
Ba-139	1.3840	h	0.34	6.7087E+15	25.22	0.0454	0.8990	0.0000
La-140	1.6780	d	0.01	1.7019E+17	21.99	2.3200	0.5340	0.0000
Np-239	2.3550	d	0.17	1.9275E+17	17.75	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.4463E+17	16.26	0.0617	0.2700	0.0000
Eu-154m	46.400	m	1.08	1.7897E+15	12.04	0.0842	0.0000	0.0000
Y-90m	3.1890	h	0.31	6.1068E+15	9.965	0.6340	0.0475	0.0000
Zn-69	56.400	m	1.60	1.5970E+15	8.841	0.0003	0.3216	0.0000
Sr-87m	2.8030	h	0.11	3.8656E+15	7.177	0.3215	0.0674	0.0000
Zn-69m	13.760	h	0.15	1.6148E+16	6.107	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	2.7909E+16	5.536	0.4300	1.0610	0.0000
Sc-49	57.200	m	0.35	9.0944E+14	4.964	0.0026	0.8180	0.0000
Cl-38	37.200	m	0.27	4.0693E+14	3.415	1.5110	1.5200	0.0000
Pa-233	27.000	d	0.37	3.5838E+17	2.878	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	3.0446E+16	2.472	0.0020	0.9336	0.0000
P-32	14.270	d	0.28	1.1626E+17	1.767	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.6853E+16	1.738	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	9.1673E+15	1.662	0.0600	0.2070	0.0000
Rb-86	18.630	d	0.11	1.1606E+17	1.351	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7251E+18	1.243	0.0016	0.0038	0.0000
Sc-46	83.780	d	0.02	3.8710E+17	1.002	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.7421E+17	0.8490	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0622E+17	0.8312	0.0328	0.0031	0.0000
Ar-41	1.8270	h	0.36	2.9044E+14	0.8273	1.2840	0.4639	0.0000
Kr-85m	4.4810	h	0.18	6.9883E+14	0.8116	0.1570	0.2282	0.0000
Hf-181	42.380	d	0.14	1.3123E+17	0.6714	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8514E+18	0.6591	2.5030	0.0964	0.0000
Xe-135	9.1390	h	0.22	1.0514E+15	0.5987	0.2490	0.3190	0.0000
Ca-45	163.00	d	0.61	3.7096E+17	0.4935	0.0000	0.0769	0.0000
Co-58m	8.9000	h	1.12	8.2749E+14	0.4838	0.0019	0.0208	0.0000
Mn-54	312.20	d	0.01	6.6278E+17	0.4603	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.2131E+17	0.4184	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5603E+17	0.3875	0.0000	0.0486	0.0000
Sb-122	2.7000	d	0.37	4.7516E+15	0.3816	0.4340	0.5660	0.0000
Th-233	22.300	m	0.45	2.1137E+13	0.2959	0.0369	0.4043	0.0000
Cs-134	2.0650	y	0.03	9.0763E+17	0.2609	1.5500	0.1640	0.0000
U-239	23.470	m	0.21	1.9467E+13	0.2590	0.0521	0.3947	0.0000
Ba-133m	1.5910	d	0.79	1.5344E+15	0.2091	0.0668	0.2190	0.0000
Ni-65	2.5200	h	0.04	7.1504E+13	0.1477	0.5583	0.6276	0.0000
Ba-131	11.550	d	0.43	5.6423E+15	0.1059	0.4580	0.0446	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155343D+20

Total number of nuclides = 596
Total activity (Ci) = 35606.

Total number of decays = 1.29620E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 18.874
Average chain length = 1.0247

Average gamma E (MeV) = 1.7639
Average beta E (MeV) = 0.74625
Average alpha E (MeV) = 4.08780E-11

Composite Exposure Rate Conversion Factor = 27.3613968 R/hr per Ci/m2
Composite ECF per FGR table = 29.9245911 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 22.0488167 Rem/hr per Ci/m2

Ground Source

Point in time = 6.52478266 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	3.0378E+19	1.0567E+04	4.1240	0.5546	0.0000
Si-31	2.6200	h	0.38	3.4738E+18	6900.	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	3.0553E+18	6158.	1.6910	0.8309	0.0000
K-42	12.360	h	0.02	1.0743E+19	4523.	0.2786	1.4310	0.0000
Eu-152m	9.2750	h	0.10	6.6997E+17	375.9	0.3070	0.5070	0.0000
Cs-134m	2.9080	h	0.10	1.1195E+17	200.3	0.0268	0.1090	0.0000
Cu-64	12.700	h	0.02	2.1467E+17	87.96	0.1920	0.0734	0.0490
Hf-180m	5.5000	h	1.82	3.9073E+16	36.97	0.9980	0.0000	0.0000
Ga-72	14.100	h	0.07	9.7231E+16	35.88	2.7080	0.5028	0.0000
Ar-37	35.030	d	0.09	4.4271E+18	27.40	0.0002	0.0019	0.0000
La-140	1.6780	d	0.01	1.6642E+17	21.50	2.3200	0.5340	0.0000
Np-239	2.3550	d	0.17	1.8972E+17	17.47	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.4184E+17	15.95	0.0617	0.2700	0.0000
Ba-139	1.3840	h	0.34	3.4978E+15	13.15	0.0454	0.8990	0.0000
Y-90m	3.1890	h	0.31	4.6033E+15	7.512	0.6340	0.0475	0.0000
Zn-69	56.400	m	1.60	1.2671E+15	7.014	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	1.5125E+16	5.720	0.4161	0.0226	0.0000
As-76	1.0930	d	0.34	2.6966E+16	5.349	0.4300	1.0610	0.0000
Sr-87m	2.8030	h	0.11	2.8026E+15	5.203	0.3215	0.0674	0.0000
Eu-154m	46.400	m	1.08	5.5796E+14	3.755	0.0842	0.0000	0.0000
Pa-233	27.000	d	0.37	3.5790E+17	2.874	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	3.1513E+16	2.558	0.0020	0.9336	0.0000
Sc-49	57.200	m	0.35	3.5331E+14	1.929	0.0026	0.8180	0.0000
P-32	14.270	d	0.28	1.1596E+17	1.762	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.6558E+16	1.718	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	8.8839E+15	1.611	0.0600	0.2070	0.0000
Rb-86	18.630	d	0.11	1.1582E+17	1.348	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7249E+18	1.243	0.0016	0.0038	0.0000
Sc-46	83.780	d	0.02	3.8693E+17	1.001	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.7406E+17	0.8483	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0608E+17	0.8300	0.0328	0.0031	0.0000
Cl-38	37.200	m	0.27	9.5092E+13	0.7981	1.5110	1.5200	0.0000
Hf-181	42.380	d	0.14	1.3112E+17	0.6708	0.5180	0.1204	0.0000
Kr-85m	4.4810	h	0.18	5.7150E+14	0.6637	0.1570	0.2282	0.0000
Co-60	5.2701	y	0.02	5.8513E+18	0.6591	2.5030	0.0964	0.0000
Xe-135	9.1390	h	0.22	9.5263E+14	0.5424	0.2490	0.3190	0.0000
Ar-41	1.8270	h	0.36	1.7734E+14	0.5051	1.2840	0.4639	0.0000
Ca-45	163.00	d	0.61	3.7087E+17	0.4933	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6270E+17	0.4603	0.8359	0.0034	0.0000
Co-58m	8.9000	h	1.12	7.4779E+14	0.4372	0.0019	0.0208	0.0000
Ta-182	114.70	d	0.35	2.2124E+17	0.4182	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5596E+17	0.3873	0.0000	0.0486	0.0000
Sb-122	2.7000	d	0.37	4.6860E+15	0.3763	0.4340	0.5660	0.0000
Cs-134	2.0650	y	0.03	9.4826E+17	0.2726	1.5500	0.1640	0.0000
Ba-133m	1.5910	d	0.79	1.4986E+15	0.2042	0.0668	0.2190	0.0000
Ba-131	11.550	d	0.43	5.6240E+15	0.1056	0.4580	0.0446	0.0000
Ni-65	2.5200	h	0.04	5.0003E+13	0.1033	0.5583	0.6276	0.0000
Br-82	1.4720	d	0.08	6.8945E+14	0.1016	2.6600	0.1439	0.0000
Eu-152	13.520	y	0.10	2.0609E+18	9.0491E-02	1.1600	0.1270	0.0001

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155340D+20

Total number of nuclides = 591
Total activity (Ci) = 29041.

Total number of decays = 1.35190E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 19.685
Average chain length = 1.0247

Average gamma E (MeV) = 1.9150
Average beta E (MeV) = 0.75224
Average alpha E (MeV) = 6.36152E-11

Composite Exposure Rate Conversion Factor = 29.4109554 R/hr per Ci/m2
Composite ECF per FGR table = 32.3868256 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 23.9372349 Rem/hr per Ci/m2

Ground Source

Point in time = 8.14881039 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24	14.960 h 0.01	2.8176E+19	9801.	4.1240	0.5546	0.0000	0.0000
Si-31	2.6200 h 0.38	2.2605E+18	4490.	0.0018	0.5952	0.0000	0.0000
K-42	12.360 h 0.02	9.8081E+18	4129.	0.2786	1.4310	0.0000	0.0000
Mn-56	2.5820 h 0.19	1.9756E+18	3982.	1.6910	0.8309	0.0000	0.0000
Eu-152m	9.2750 h 0.10	5.9340E+17	332.9	0.3070	0.5070	0.0000	0.0000
Cs-134m	2.9080 h 0.10	7.6014E+16	136.0	0.0268	0.1090	0.0000	0.0000
Cu-64	12.700 h 0.02	1.9646E+17	80.50	0.1920	0.0734	0.0490	0.0000
Ga-72	14.100 h 0.07	8.9770E+16	33.13	2.7080	0.5028	0.0000	0.0000
Hf-180m	5.5000 h 1.82	3.1841E+16	30.13	0.9980	0.0000	0.0000	0.0000
Ar-37	35.030 d 0.09	4.4212E+18	27.37	0.0002	0.0019	0.0000	0.0000
La-140	1.6780 d 0.01	1.6183E+17	20.91	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550 d 0.17	1.8598E+17	17.12	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.3843E+17	15.57	0.0617	0.2700	0.0000	0.0000
Zn-69	56.400 m 1.60	1.0694E+15	5.920	0.0003	0.3216	0.0000	0.0000
Ba-139	1.3840 h 0.34	1.5508E+15	5.831	0.0454	0.8990	0.0000	0.0000
Y-90m	3.1890 h 0.31	3.2342E+15	5.278	0.6340	0.0475	0.0000	0.0000
Zn-69m	13.760 h 0.15	1.3936E+16	5.271	0.4161	0.0226	0.0000	0.0000
As-76	1.0930 d 0.34	2.5833E+16	5.125	0.4300	1.0610	0.0000	0.0000
Sr-87m	2.8030 h 0.11	1.8756E+15	3.482	0.3215	0.0674	0.0000	0.0000
Pa-233	27.000 d 0.37	3.5728E+17	2.869	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710 d 0.12	3.2321E+16	2.624	0.0020	0.9336	0.0000	0.0000
P-32	14.270 d 0.28	1.1558E+17	1.756	0.0012	0.6949	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.6195E+16	1.695	0.1089	0.1619	0.0000	0.0000
Ba-135m	1.1960 d 0.70	8.5423E+15	1.549	0.0600	0.2070	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1553E+17	1.345	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7247E+18	1.243	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8671E+17	1.001	2.0090	0.1118	0.0000	0.0000
Eu-154m	46.400 m 1.08	1.3014E+14	0.8758	0.0842	0.0000	0.0000	0.0000
Fe-59	44.490 d 0.02	1.7388E+17	0.8474	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710 d 0.01	1.0590E+17	0.8286	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380 d 0.14	1.3097E+17	0.6701	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701 y 0.02	5.8511E+18	0.6591	2.5030	0.0964	0.0000	0.0000
Sc-49	57.200 m 0.35	1.0848E+14	0.5921	0.0026	0.8180	0.0000	0.0000
Kr-85m	4.4810 h 0.18	4.4454E+14	0.5163	0.1570	0.2282	0.0000	0.0000
Ca-45	163.00 d 0.61	3.7076E+17	0.4932	0.0000	0.0769	0.0000	0.0000
Xe-135	9.1390 h 0.22	8.4223E+14	0.4796	0.2490	0.3190	0.0000	0.0000
Mn-54	312.20 d 0.01	6.6260E+17	0.4602	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70 d 0.35	2.2115E+17	0.4180	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01 y 3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310 d 0.18	1.5588E+17	0.3871	0.0000	0.0486	0.0000	0.0000
Co-58m	8.9000 h 1.12	6.5894E+14	0.3853	0.0019	0.0208	0.0000	0.0000
Sb-122	2.7000 d 0.37	4.6053E+15	0.3698	0.4340	0.5660	0.0000	0.0000
Cs-134	2.0650 y 0.03	9.8413E+17	0.2829	1.5500	0.1640	0.0000	0.0000
Ar-41	1.8270 h 0.36	9.5766E+13	0.2728	1.2840	0.4639	0.0000	0.0000
Ba-133m	1.5910 d 0.79	1.4550E+15	0.1983	0.0668	0.2190	0.0000	0.0000
Cl-38	37.200 m 0.27	1.5475E+13	0.1299	1.5110	1.5200	0.0000	0.0000
Ba-131	11.550 d 0.43	5.6012E+15	0.1052	0.4580	0.0446	0.0000	0.0000
Br-82	1.4720 d 0.08	6.6783E+14	9.8371E-02	2.6600	0.1439	0.0000	0.0000
Eu-152	13.520 y 0.10	2.0609E+18	9.0490E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000 d 1.43	2.6072E+16	8.0759E-02	0.3518	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 588
Total activity (Ci) = 23151.

Total number of decays = 1.40797E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 20.502
Average chain length = 1.0247

Average gamma E (MeV) = 2.1003
Average beta E (MeV) = 0.75910
Average alpha E (MeV) = 1.00574E-10

Composite Exposure Rate Conversion Factor = 31.9280148 R/hr per Ci/m2
Composite ECF per FGR table = 35.4075661 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 26.2535534 Rem/hr per Ci/m2

Ground Source

Point in time = 10.1770706 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	2.5649E+19	8922.	4.1240	0.5546	0.0000	0.0000
K-42	12.360	h	0.02	8.7536E+18	3685.	0.2786	1.4310	0.0000	0.0000
Si-31	2.6200	h	0.38	1.3218E+18	2625.	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.1461E+18	2310.	1.6910	0.8309	0.0000	0.0000
Eu-152m	9.2750	h	0.10	5.0994E+17	286.1	0.3070	0.5070	0.0000	0.0000
Cs-134m	2.9080	h	0.10	4.6874E+16	83.88	0.0268	0.1090	0.0000	0.0000
Cu-64	12.700	h	0.02	1.7587E+17	72.06	0.1920	0.0734	0.0490	0.0000
Ga-72	14.100	h	0.07	8.1251E+16	29.99	2.7080	0.5028	0.0000	0.0000
Ar-37	35.030	d	0.09	4.4138E+18	27.32	0.0002	0.0019	0.0000	0.0000
Hf-180m	5.5000	h	1.82	2.4659E+16	23.33	0.9980	0.0000	0.0000	0.0000
La-140	1.6780	d	0.01	1.5628E+17	20.19	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550	d	0.17	1.8141E+17	16.70	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280	d	0.01	1.3429E+17	15.10	0.0617	0.2700	0.0000	0.0000
Zn-69	56.400	m	1.60	9.3306E+14	5.165	0.0003	0.3216	0.0000	0.0000
As-76	1.0930	d	0.34	2.4485E+16	4.857	0.4300	1.0610	0.0000	0.0000
Zn-69m	13.760	h	0.15	1.2583E+16	4.759	0.4161	0.0226	0.0000	0.0000
Y-90m	3.1890	h	0.31	2.0812E+15	3.396	0.6340	0.0475	0.0000	0.0000
Pa-233	27.000	d	0.37	3.5650E+17	2.863	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710	d	0.12	3.2760E+16	2.659	0.0020	0.9336	0.0000	0.0000
Ba-139	1.3840	h	0.34	5.6156E+14	2.111	0.0454	0.8990	0.0000	0.0000
Sr-87m	2.8030	h	0.11	1.1359E+15	2.109	0.3215	0.0674	0.0000	0.0000
P-32	14.270	d	0.28	1.1510E+17	1.749	0.0012	0.6949	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.5748E+16	1.666	0.1089	0.1619	0.0000	0.0000
Ba-135m	1.1960	d	0.70	8.1340E+15	1.475	0.0600	0.2070	0.0000	0.0000
Rb-86	18.630	d	0.11	1.1517E+17	1.340	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.7243E+18	1.242	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.8644E+17	1.000	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490	d	0.02	1.7365E+17	0.8463	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0567E+17	0.8269	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	1.3079E+17	0.6691	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8509E+18	0.6591	2.5030	0.0964	0.0000	0.0000
Ca-45	163.00	d	0.61	3.7063E+17	0.4930	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.6248E+17	0.4601	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70	d	0.35	2.2103E+17	0.4178	1.2910	0.2070	0.0000	0.0000
Xe-135	9.1390	h	0.22	7.2214E+14	0.4112	0.2490	0.3190	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310	d	0.18	1.5577E+17	0.3869	0.0000	0.0486	0.0000	0.0000
Kr-85m	4.4810	h	0.18	3.2483E+14	0.3772	0.1570	0.2282	0.0000	0.0000
Sb-122	2.7000	d	0.37	4.5064E+15	0.3619	0.4340	0.5660	0.0000	0.0000
Co-58m	8.9000	h	1.12	5.6266E+14	0.3290	0.0019	0.0208	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0132E+18	0.2913	1.5500	0.1640	0.0000	0.0000
Ba-133m	1.5910	d	0.79	1.4024E+15	0.1911	0.0668	0.2190	0.0000	0.0000
Eu-154m	46.400	m	1.08	2.1130E+13	0.1422	0.0842	0.0000	0.0000	0.0000
Sc-49	57.200	m	0.35	2.4825E+13	0.1355	0.0026	0.8180	0.0000	0.0000
Ar-41	1.8270	h	0.36	4.4363E+13	0.1264	1.2840	0.4639	0.0000	0.0000
Ba-131	11.550	d	0.43	5.5729E+15	0.1046	0.4580	0.0446	0.0000	0.0000
Br-82	1.4720	d	0.08	6.4177E+14	9.4533E-02	2.6600	0.1439	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0609E+18	9.0489E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000	d	1.43	2.6050E+16	8.0691E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10	d	0.04	8.3290E+16	7.3983E-02	0.5900	0.0044	0.0020	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
 Current number of atoms = 6.702196336155334D+20
 Difference in atom count = 1.70E+06
 Fractional difference = 2.54E-15

Total number of nuclides = 584
 Total activity (Ci) = 18162.

Total number of decays = 1.46331E+20
 Asympt number of decays = 6.86756E+20
 Percent of decays = 21.308
 Average chain length = 1.0247

Average gamma E (MeV) = 2.3129
 Average beta E (MeV) = 0.76614
 Average alpha E (MeV) = 1.60555E-10

Composite Exposure Rate Conversion Factor = 34.8210449 R/hr per Ci/m2
 Composite ECF per FGR table = 38.8744316 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 28.9109516 Rem/hr per Ci/m2

Ground Source

Point in time = 12.7101564 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	2.2809E+19	7934.	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	7.5944E+18	3197.	0.2786	1.4310	0.0000
Si-31	2.6200	h	0.38	6.7627E+17	1343.	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	5.8064E+17	1170.	1.6910	0.8309	0.0000
Eu-152m	9.2750	h	0.10	4.2199E+17	236.8	0.3070	0.5070	0.0000
Cu-64	12.700	h	0.02	1.5317E+17	62.76	0.1920	0.0734	0.0490
Cs-134m	2.9080	h	0.10	2.5628E+16	45.86	0.0268	0.1090	0.0000
Ar-37	35.030	d	0.09	4.4046E+18	27.26	0.0002	0.0019	0.0000
Ga-72	14.100	h	0.07	7.1738E+16	26.48	2.7080	0.5028	0.0000
La-140	1.6780	d	0.01	1.4961E+17	19.33	2.3200	0.5340	0.0000
Hf-180m	5.5000	h	1.82	1.7920E+16	16.95	0.9980	0.0000	0.0000
Np-239	2.3550	d	0.17	1.7586E+17	16.19	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.2929E+17	14.54	0.0617	0.2700	0.0000
As-76	1.0930	d	0.34	2.2900E+16	4.543	0.4300	1.0610	0.0000
Zn-69	56.400	m	1.60	8.1350E+14	4.504	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	1.1076E+16	4.189	0.4161	0.0226	0.0000
Pa-233	27.000	d	0.37	3.5554E+17	2.855	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	3.2743E+16	2.658	0.0020	0.9336	0.0000
Y-90m	3.1890	h	0.31	1.2000E+15	1.958	0.6340	0.0475	0.0000
P-32	14.270	d	0.28	1.1452E+17	1.740	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.5201E+16	1.631	0.1089	0.1619	0.0000
Ba-135m	1.1960	d	0.70	7.6513E+15	1.387	0.0600	0.2070	0.0000
Rb-86	18.630	d	0.11	1.1472E+17	1.335	0.0957	0.6670	0.0000
Fe-55	2.7351	y	0.80	5.7239E+18	1.242	0.0016	0.0038	0.0000
Sr-87m	2.8030	h	0.11	6.0713E+14	1.127	0.3215	0.0674	0.0000
Sc-46	83.780	d	0.02	3.8611E+17	0.9993	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.7336E+17	0.8449	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0539E+17	0.8247	0.0328	0.0031	0.0000
Hf-181	42.380	d	0.14	1.3056E+17	0.6680	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8507E+18	0.6590	2.5030	0.0964	0.0000
Ba-139	1.3840	h	0.34	1.5792E+14	0.5938	0.0454	0.8990	0.0000
Ca-45	163.00	d	0.61	3.7046E+17	0.4928	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6232E+17	0.4600	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.2089E+17	0.4176	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5564E+17	0.3865	0.0000	0.0486	0.0000
Sb-122	2.7000	d	0.37	4.3860E+15	0.3522	0.4340	0.5660	0.0000
Xe-135	9.1390	h	0.22	5.9592E+14	0.3393	0.2490	0.3190	0.0000
Cs-134	2.0650	y	0.03	1.0343E+18	0.2973	1.5500	0.1640	0.0000
Co-58m	8.9000	h	1.12	4.6192E+14	0.2701	0.0019	0.0208	0.0000
Kr-85m	4.4810	h	0.18	2.1953E+14	0.2549	0.1570	0.2282	0.0000
Ba-133m	1.5910	d	0.79	1.3394E+15	0.1825	0.0668	0.2190	0.0000
Ba-131	11.550	d	0.43	5.5377E+15	0.1040	0.4580	0.0446	0.0000
Eu-152	13.520	y	0.10	2.0608E+18	9.0488E-02	1.1600	0.1270	0.0001
Br-82	1.4720	d	0.08	6.1066E+14	8.9949E-02	2.6600	0.1439	0.0000
Hf-175	70.000	d	1.43	2.6023E+16	8.0607E-02	0.3518	0.0000	0.0000
Zn-65	244.10	d	0.04	8.3265E+16	7.3961E-02	0.5900	0.0044	0.0020
Ar-41	1.8270	h	0.36	1.6969E+13	4.8332E-02	1.2840	0.4639	0.0000
Tb-160	72.300	d	0.28	1.1840E+16	3.5507E-02	1.1300	0.2540	0.0000
Eu-154	8.5942	y	0.04	3.8675E+17	2.6715E-02	1.2500	0.2790	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 579
Total activity (Ci) = 14149.

Total number of decays = 1.51730E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 22.094
Average chain length = 1.0247

Average gamma E (MeV) = 2.5322
Average beta E (MeV) = 0.77199
Average alpha E (MeV) = 2.56557E-10

Composite Exposure Rate Conversion Factor = 37.8135033 R/hr per Ci/m2
Composite ECF per FGR table = 42.4529381 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 31.6522350 Rem/hr per Ci/m2

Ground Source

Point in time = 15.8737326 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	1.9699E+19	6852.	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	6.3598E+18	2678.	0.2786	1.4310	0.0000
Si-31	2.6200	h	0.38	2.9284E+17	581.6	0.0018	0.5952	0.0000
Mn-56	2.5820	h	0.19	2.4836E+17	500.5	1.6910	0.8309	0.0000
Eu-152m	9.2750	h	0.10	3.3314E+17	186.9	0.3070	0.5070	0.0000
Cu-64	12.700	h	0.02	1.2888E+17	52.81	0.1920	0.0734	0.0490
Ar-37	35.030	d	0.09	4.3931E+18	27.19	0.0002	0.0019	0.0000
Ga-72	14.100	h	0.07	6.1405E+16	22.66	2.7080	0.5028	0.0000
Cs-134m	2.9080	h	0.10	1.2057E+16	21.58	0.0268	0.1090	0.0000
La-140	1.6780	d	0.01	1.4169E+17	18.31	2.3200	0.5340	0.0000
Np-239	2.3550	d	0.17	1.6917E+17	15.58	0.1740	0.1079	0.0000
Sm-153	1.9280	d	0.01	1.2330E+17	13.87	0.0617	0.2700	0.0000
Hf-180m	5.5000	h	1.82	1.2028E+16	11.38	0.9980	0.0000	0.0000
As-76	1.0930	d	0.34	2.1064E+16	4.179	0.4300	1.0610	0.0000
Zn-69	56.400	m	1.60	6.9241E+14	3.833	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	9.4439E+15	3.572	0.4161	0.0226	0.0000
Pa-233	27.000	d	0.37	3.5434E+17	2.846	0.2175	0.0664	0.0000
Y-90	2.6710	d	0.12	3.2227E+16	2.616	0.0020	0.9336	0.0000
P-32	14.270	d	0.28	1.1379E+17	1.729	0.0012	0.6949	0.0000
Sc-47	3.3510	d	0.06	2.4534E+16	1.587	0.1089	0.1619	0.0000
Rb-86	18.630	d	0.11	1.1416E+17	1.329	0.0957	0.6670	0.0000
Ba-135m	1.1960	d	0.70	7.0886E+15	1.285	0.0600	0.2070	0.0000
Fe-55	2.7351	y	0.80	5.7234E+18	1.242	0.0016	0.0038	0.0000
Sc-46	83.780	d	0.02	3.8568E+17	0.9982	2.0090	0.1118	0.0000
Y-90m	3.1890	h	0.31	6.0334E+14	0.9845	0.6340	0.0475	0.0000
Fe-59	44.490	d	0.02	1.7301E+17	0.8432	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0505E+17	0.8220	0.0328	0.0031	0.0000
Hf-181	42.380	d	0.14	1.3028E+17	0.6666	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	5.8504E+18	0.6590	2.5030	0.0964	0.0000
Sr-87m	2.8030	h	0.11	2.7767E+14	0.5155	0.3215	0.0674	0.0000
Ca-45	163.00	d	0.61	3.7026E+17	0.4925	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.6213E+17	0.4599	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.2072E+17	0.4172	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5548E+17	0.3861	0.0000	0.0486	0.0000
Sb-122	2.7000	d	0.37	4.2400E+15	0.3405	0.4340	0.5660	0.0000
Cs-134	2.0650	y	0.03	1.0478E+18	0.3012	1.5500	0.1640	0.0000
Xe-135	9.1390	h	0.22	4.6879E+14	0.2669	0.2490	0.3190	0.0000
Co-58m	8.9000	h	1.12	3.6105E+14	0.2111	0.0019	0.0208	0.0000
Ba-133m	1.5910	d	0.79	1.2647E+15	0.1724	0.0668	0.2190	0.0000
Kr-85m	4.4810	h	0.18	1.3457E+14	0.1563	0.1570	0.2282	0.0000
Ba-139	1.3840	h	0.34	3.2384E+13	0.1218	0.0454	0.8990	0.0000
Ba-131	11.550	d	0.43	5.4941E+15	0.1031	0.4580	0.0446	0.0000
Eu-152	13.520	y	0.10	2.0608E+18	9.0486E-02	1.1600	0.1270	0.0001
Br-82	1.4720	d	0.08	5.7390E+14	8.4536E-02	2.6600	0.1439	0.0000
Hf-175	70.000	d	1.43	2.5989E+16	8.0502E-02	0.3518	0.0000	0.0000
Zn-65	244.10	d	0.04	8.3234E+16	7.3933E-02	0.5900	0.0044	0.0020
Tb-160	72.300	d	0.28	1.1825E+16	3.5462E-02	1.1300	0.2540	0.0000
Eu-154	8.5942	y	0.04	3.8675E+17	2.6715E-02	1.2500	0.2790	0.0000
Ca-47	4.5380	d	0.04	5.3466E+14	2.5546E-02	1.0600	0.4004	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 575
Total activity (Ci) = 11016.

Total number of decays = 1.56980E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 22.858
Average chain length = 1.0247

Average gamma E (MeV) = 2.7279
Average beta E (MeV) = 0.77489
Average alpha E (MeV) = 4.07759E-10

Composite Exposure Rate Conversion Factor = 40.4949303 R/hr per Ci/m2
Composite ECF per FGR table = 45.6489944 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 34.0982399 Rem/hr per Ci/m2

Ground Source

Point in time = 19.8247452 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	1.6404E+19	5706.	4.1240	0.5546	0.0000	0.0000
K-42	12.360	h	0.02	5.0958E+18	2145.	0.2786	1.4310	0.0000	0.0000
Si-31	2.6200	h	0.38	1.0296E+17	204.5	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820	h	0.19	8.5987E+16	173.3	1.6910	0.8309	0.0000	0.0000
Eu-152m	9.2750	h	0.10	2.4797E+17	139.1	0.3070	0.5070	0.0000	0.0000
Cu-64	12.700	h	0.02	1.0388E+17	42.56	0.1920	0.0734	0.0490	0.0000
Ar-37	35.030	d	0.09	4.3788E+18	27.10	0.0002	0.0019	0.0000	0.0000
Ga-72	14.100	h	0.07	5.0565E+16	18.66	2.7080	0.5028	0.0000	0.0000
La-140	1.6780	d	0.01	1.3237E+17	17.10	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550	d	0.17	1.6117E+17	14.84	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280	d	0.01	1.1622E+17	13.07	0.0617	0.2700	0.0000	0.0000
Cs-134m	2.9080	h	0.10	4.7014E+15	8.413	0.0268	0.1090	0.0000	0.0000
Hf-180m	5.5000	h	1.82	7.3103E+15	6.917	0.9980	0.0000	0.0000	0.0000
As-76	1.0930	d	0.34	1.8975E+16	3.764	0.4300	1.0610	0.0000	0.0000
Zn-69	56.400	m	1.60	5.6733E+14	3.141	0.0003	0.3216	0.0000	0.0000
Zn-69m	13.760	h	0.15	7.7396E+15	2.927	0.4161	0.0226	0.0000	0.0000
Pa-233	27.000	d	0.37	3.5284E+17	2.834	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710	d	0.12	3.1218E+16	2.534	0.0020	0.9336	0.0000	0.0000
P-32	14.270	d	0.28	1.1288E+17	1.715	0.0012	0.6949	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.3726E+16	1.535	0.1089	0.1619	0.0000	0.0000
Rb-86	18.630	d	0.11	1.1346E+17	1.321	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.7227E+18	1.242	0.0016	0.0038	0.0000	0.0000
Ba-135m	1.1960	d	0.70	6.4435E+15	1.168	0.0600	0.2070	0.0000	0.0000
Sc-46	83.780	d	0.02	3.8516E+17	0.9968	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490	d	0.02	1.7256E+17	0.8410	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0462E+17	0.8186	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	1.2993E+17	0.6648	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8501E+18	0.6590	2.5030	0.0964	0.0000	0.0000
Ca-45	163.00	d	0.61	3.7000E+17	0.4922	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.6189E+17	0.4597	0.8359	0.0034	0.0000	0.0000
Y-90m	3.1890	h	0.31	2.5562E+14	0.4171	0.6340	0.0475	0.0000	0.0000
Ta-182	114.70	d	0.35	2.2050E+17	0.4168	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310	d	0.18	1.5528E+17	0.3856	0.0000	0.0486	0.0000	0.0000
Sb-122	2.7000	d	0.37	4.0646E+15	0.3264	0.4340	0.5660	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0550E+18	0.3033	1.5500	0.1640	0.0000	0.0000
Xe-135	9.1390	h	0.22	3.4741E+14	0.1978	0.2490	0.3190	0.0000	0.0000
Sr-87m	2.8030	h	0.11	1.0452E+14	0.1940	0.3215	0.0674	0.0000	0.0000
Ba-133m	1.5910	d	0.79	1.1771E+15	0.1604	0.0668	0.2190	0.0000	0.0000
Co-58m	8.9000	h	1.12	2.6542E+14	0.1552	0.0019	0.0208	0.0000	0.0000
Ba-131	11.550	d	0.43	5.4400E+15	0.1021	0.4580	0.0446	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0608E+18	9.0484E-02	1.1600	0.1270	0.0001	0.0000
Kr-85m	4.4810	h	0.18	7.3036E+13	8.4817E-02	0.1570	0.2282	0.0000	0.0000
Hf-175	70.000	d	1.43	2.5947E+16	8.0371E-02	0.3518	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	5.3110E+14	7.8230E-02	2.6600	0.1439	0.0000	0.0000
Zn-65	244.10	d	0.04	8.3195E+16	7.3899E-02	0.5900	0.0044	0.0020	0.0000
Tb-160	72.300	d	0.28	1.1806E+16	3.5406E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8673E+17	2.6714E-02	1.2500	0.2790	0.0000	0.0000
Ca-47	4.5380	d	0.04	5.2139E+14	2.4912E-02	1.0600	0.4004	0.0000	0.0000
Ba-139	1.3840	h	0.34	4.4767E+12	1.6832E-02	0.0454	0.8990	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 568
Total activity (Ci) = 8547.9

Total number of decays = 1.62081E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 23.601
Average chain length = 1.0247

Average gamma E (MeV) = 2.8762
Average beta E (MeV) = 0.77353
Average alpha E (MeV) = 6.46204E-10

Composite Exposure Rate Conversion Factor = 42.5424995 R/hr per Ci/m2
Composite ECF per FGR table = 48.0759277 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 35.9527702 Rem/hr per Ci/m2

Ground Source

Point in time = 1.03163242 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24	14.960 h 0.01	1.3051E+19	4540.	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	3.8640E+18	1627.	0.2786	1.4310	0.0000	0.0000
Eu-152m	9.2750 h 0.10	1.7149E+17	96.22	0.3070	0.5070	0.0000	0.0000
Si-31	2.6200 h 0.38	2.7908E+16	55.43	0.0018	0.5952	0.0000	0.0000
Mn-56	2.5820 h 0.19	2.2863E+16	46.08	1.6910	0.8309	0.0000	0.0000
Cu-64	12.700 h 0.02	7.9352E+16	32.51	0.1920	0.0734	0.0490	0.0000
Ar-37	35.030 d 0.09	4.3611E+18	26.99	0.0002	0.0019	0.0000	0.0000
La-140	1.6780 d 0.01	1.2159E+17	15.71	2.3200	0.5340	0.0000	0.0000
Ga-72	14.100 h 0.07	3.9674E+16	14.64	2.7080	0.5028	0.0000	0.0000
Np-239	2.3550 d 0.17	1.5170E+17	13.97	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.0793E+17	12.14	0.0617	0.2700	0.0000	0.0000
Hf-180m	5.5000 h 1.82	3.9252E+15	3.714	0.9980	0.0000	0.0000	0.0000
As-76	1.0930 d 0.34	1.6656E+16	3.304	0.4300	1.0610	0.0000	0.0000
Pa-233	27.000 d 0.37	3.5099E+17	2.819	0.2175	0.0664	0.0000	0.0000
Cs-134m	2.9080 h 0.10	1.4502E+15	2.595	0.0268	0.1090	0.0000	0.0000
Zn-69	56.400 m 1.60	4.4246E+14	2.449	0.0003	0.3216	0.0000	0.0000
Y-90	2.6710 d 0.12	2.9759E+16	2.416	0.0020	0.9336	0.0000	0.0000
Zn-69m	13.760 h 0.15	6.0362E+15	2.283	0.4161	0.0226	0.0000	0.0000
P-32	14.270 d 0.28	1.1176E+17	1.698	0.0012	0.6949	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.2754E+16	1.472	0.1089	0.1619	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1260E+17	1.310	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7219E+18	1.242	0.0016	0.0038	0.0000	0.0000
Ba-135m	1.1960 d 0.70	5.7197E+15	1.037	0.0600	0.2070	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8450E+17	0.9951	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490 d 0.02	1.7201E+17	0.8383	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710 d 0.01	1.0408E+17	0.8144	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380 d 0.14	1.2950E+17	0.6625	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701 y 0.02	5.8497E+18	0.6589	2.5030	0.0964	0.0000	0.0000
Ca-45	163.00 d 0.61	3.6967E+17	0.4917	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20 d 0.01	6.6158E+17	0.4595	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70 d 0.35	2.2022E+17	0.4163	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01 y 3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310 d 0.18	1.5503E+17	0.3850	0.0000	0.0486	0.0000	0.0000
Sb-122	2.7000 d 0.37	3.8556E+15	0.3096	0.4340	0.5660	0.0000	0.0000
Cs-134	2.0650 y 0.03	1.0580E+18	0.3042	1.5500	0.1640	0.0000	0.0000
Ba-133m	1.5910 d 0.79	1.0763E+15	0.1467	0.0668	0.2190	0.0000	0.0000
Y-90m	3.1890 h 0.31	8.7459E+13	0.1427	0.6340	0.0475	0.0000	0.0000
Xe-135	9.1390 h 0.22	2.3895E+14	0.1361	0.2490	0.3190	0.0000	0.0000
Co-58m	8.9000 h 1.12	1.8073E+14	0.1057	0.0019	0.0208	0.0000	0.0000
Ba-131	11.550 d 0.43	5.3733E+15	0.1009	0.4580	0.0446	0.0000	0.0000
Eu-152	13.520 y 0.10	2.0607E+18	9.0481E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000 d 1.43	2.5894E+16	8.0207E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10 d 0.04	8.3146E+16	7.3856E-02	0.5900	0.0044	0.0020	0.0000
Br-82	1.4720 d 0.08	4.8209E+14	7.1012E-02	2.6600	0.1439	0.0000	0.0000
Sr-87m	2.8030 h 0.11	3.0851E+13	5.7275E-02	0.3215	0.0674	0.0000	0.0000
Kr-85m	4.4810 h 0.18	3.4044E+13	3.9536E-02	0.1570	0.2282	0.0000	0.0000
Tb-160	72.300 d 0.28	1.1783E+16	3.5336E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942 y 0.04	3.8671E+17	2.6712E-02	1.2500	0.2790	0.0000	0.0000
Ca-47	4.5380 d 0.04	5.0527E+14	2.4142E-02	1.0600	0.4004	0.0000	0.0000
Cu-67	2.5790 d 0.16	1.4687E+14	1.2348E-02	0.1154	0.1416	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 560
Total activity (Ci) = 6514.7

Total number of decays = 1.66987E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 24.315
Average chain length = 1.0247

Average gamma E (MeV) = 2.9753
Average beta E (MeV) = 0.76765
Average alpha E (MeV) = 1.03542E-09

Composite Exposure Rate Conversion Factor = 43.9266205 R/hr per Ci/m2
Composite ECF per FGR table = 49.7003365 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 37.1907806 Rem/hr per Ci/m2

Ground Source

Point in time = 1.28840601 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	9.8094E+18	3412.	4.1240	0.5546	0.0000	0.0000
K-42	12.360	h	0.02	2.7349E+18	1151.	0.2786	1.4310	0.0000	0.0000
Eu-152m	9.2750	h	0.10	1.0820E+17	60.71	0.3070	0.5070	0.0000	0.0000
Ar-37	35.030	d	0.09	4.3390E+18	26.86	0.0002	0.0019	0.0000	0.0000
Cu-64	12.700	h	0.02	5.6688E+16	23.23	0.1920	0.0734	0.0490	0.0000
La-140	1.6780	d	0.01	1.0936E+17	14.13	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550	d	0.17	1.4066E+17	12.95	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280	d	0.01	9.8417E+16	11.07	0.0617	0.2700	0.0000	0.0000
Si-31	2.6200	h	0.38	5.4660E+15	10.86	0.0018	0.5952	0.0000	0.0000
Ga-72	14.100	h	0.07	2.9305E+16	10.82	2.7080	0.5028	0.0000	0.0000
Mn-56	2.5820	h	0.19	4.3718E+15	8.811	1.6910	0.8309	0.0000	0.0000
As-76	1.0930	d	0.34	1.4153E+16	2.808	0.4300	1.0610	0.0000	0.0000
Pa-233	27.000	d	0.37	3.4868E+17	2.800	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710	d	0.12	2.7903E+16	2.265	0.0020	0.9336	0.0000	0.0000
Zn-69	56.400	m	1.60	3.2438E+14	1.796	0.0003	0.3216	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.8054E+15	1.708	0.9980	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	1.1037E+17	1.677	0.0012	0.6949	0.0000	0.0000
Zn-69m	13.760	h	0.15	4.4253E+15	1.674	0.4161	0.0226	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.1595E+16	1.397	0.1089	0.1619	0.0000	0.0000
Rb-86	18.630	d	0.11	1.1153E+17	1.298	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.7209E+18	1.242	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.8369E+17	0.9930	2.0090	0.1118	0.0000	0.0000
Ba-135m	1.1960	d	0.70	4.9288E+15	0.8936	0.0600	0.2070	0.0000	0.0000
Fe-59	44.490	d	0.02	1.7133E+17	0.8350	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0341E+17	0.8092	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	1.2895E+17	0.6598	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8491E+18	0.6589	2.5030	0.0964	0.0000	0.0000
Cs-134m	2.9080	h	0.10	3.3380E+14	0.5973	0.0268	0.1090	0.0000	0.0000
Ca-45	163.00	d	0.61	3.6927E+17	0.4912	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.6121E+17	0.4592	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70	d	0.35	2.1988E+17	0.4157	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310	d	0.18	1.5471E+17	0.3842	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0589E+18	0.3044	1.5500	0.1640	0.0000	0.0000
Sb-122	2.7000	d	0.37	3.6096E+15	0.2899	0.4340	0.5660	0.0000	0.0000
Ba-133m	1.5910	d	0.79	9.6236E+14	0.1312	0.0668	0.2190	0.0000	0.0000
Ba-131	11.550	d	0.43	5.2912E+15	9.9330E-02	0.4580	0.0446	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0606E+18	9.0478E-02	1.1600	0.1270	0.0001	0.0000
Xe-135	9.1390	h	0.22	1.4973E+14	8.5258E-02	0.2490	0.3190	0.0000	0.0000
Hf-175	70.000	d	1.43	2.5828E+16	8.0003E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10	d	0.04	8.3085E+16	7.3802E-02	0.5900	0.0044	0.0020	0.0000
Co-58m	8.9000	h	1.12	1.1184E+14	6.5391E-02	0.0019	0.0208	0.0000	0.0000
Br-82	1.4720	d	0.08	4.2718E+14	6.2924E-02	2.6600	0.1439	0.0000	0.0000
Y-90m	3.1890	h	0.31	2.2913E+13	3.7389E-02	0.6340	0.0475	0.0000	0.0000
Tb-160	72.300	d	0.28	1.1754E+16	3.5250E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8669E+17	2.6711E-02	1.2500	0.2790	0.0000	0.0000
Ca-47	4.5380	d	0.04	4.8583E+14	2.3213E-02	1.0600	0.4004	0.0000	0.0000
Kr-85m	4.4810	h	0.18	1.3123E+13	1.5240E-02	0.1570	0.2282	0.0000	0.0000
Sr-87m	2.8030	h	0.11	6.7210E+12	1.2478E-02	0.3215	0.0674	0.0000	0.0000
Cu-67	2.5790	d	0.16	1.3708E+14	1.1525E-02	0.1154	0.1416	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155343D+20

Total number of nuclides = 550
Total activity (Ci) = 4770.9

Total number of decays = 1.71576E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 24.983
Average chain length = 1.0247

Average gamma E (MeV) = 3.0408
Average beta E (MeV) = 0.75758
Average alpha E (MeV) = 1.71319E-09

Composite Exposure Rate Conversion Factor = 44.8599930 R/hr per Ci/m2
Composite ECF per FGR table = 50.7795601 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 38.0100365 Rem/hr per Ci/m2

Ground Source

Point in time = 1.60909343 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24	14.960 h 0.01	6.8670E+18	2389.	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	1.7762E+18	747.8	0.2786	1.4310	0.0000	0.0000
Eu-152m	9.2750 h 0.10	6.0874E+16	34.15	0.3070	0.5070	0.0000	0.0000
Ar-37	35.030 d 0.09	4.3115E+18	26.69	0.0002	0.0019	0.0000	0.0000
Cu-64	12.700 h 0.02	3.7244E+16	15.26	0.1920	0.0734	0.0490	0.0000
La-140	1.6780 d 0.01	9.5788E+16	12.38	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550 d 0.17	1.2799E+17	11.78	0.1740	0.1079	0.0000	0.0000
Sm-153	1.9280 d 0.01	8.7700E+16	9.863	0.0617	0.2700	0.0000	0.0000
Ga-72	14.100 h 0.07	2.0073E+16	7.408	2.7080	0.5028	0.0000	0.0000
Pa-233	27.000 d 0.37	3.4582E+17	2.777	0.2175	0.0664	0.0000	0.0000
As-76	1.0930 d 0.34	1.1548E+16	2.291	0.4300	1.0610	0.0000	0.0000
Y-90	2.6710 d 0.12	2.5693E+16	2.086	0.0020	0.9336	0.0000	0.0000
P-32	14.270 d 0.28	1.0867E+17	1.651	0.0012	0.6949	0.0000	0.0000
Si-31	2.6200 h 0.38	7.1345E+14	1.417	0.0018	0.5952	0.0000	0.0000
Sc-47	3.3510 d 0.06	2.0232E+16	1.309	0.1089	0.1619	0.0000	0.0000
Rb-86	18.630 d 0.11	1.1020E+17	1.283	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7196E+18	1.241	0.0016	0.0038	0.0000	0.0000
Zn-69	56.400 m 1.60	2.2013E+14	1.219	0.0003	0.3216	0.0000	0.0000
Zn-69m	13.760 h 0.15	3.0031E+15	1.136	0.4161	0.0226	0.0000	0.0000
Mn-56	2.5820 h 0.19	5.5378E+14	1.116	1.6910	0.8309	0.0000	0.0000
Sc-46	83.780 d 0.02	3.8267E+17	0.9904	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490 d 0.02	1.7047E+17	0.8308	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710 d 0.01	1.0259E+17	0.8027	0.0328	0.0031	0.0000	0.0000
Ba-135m	1.1960 d 0.70	4.0929E+15	0.7420	0.0600	0.2070	0.0000	0.0000
Co-60	5.2701 y 0.02	5.8484E+18	0.6588	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380 d 0.14	1.2828E+17	0.6563	0.5180	0.1204	0.0000	0.0000
Hf-180m	5.5000 h 1.82	6.8441E+14	0.6476	0.9980	0.0000	0.0000	0.0000
Ca-45	163.00 d 0.61	3.6877E+17	0.4905	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20 d 0.01	6.6074E+17	0.4589	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70 d 0.35	2.1946E+17	0.4149	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01 y 3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310 d 0.18	1.5432E+17	0.3832	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650 y 0.03	1.0589E+18	0.3044	1.5500	0.1640	0.0000	0.0000
Sb-122	2.7000 d 0.37	3.3244E+15	0.2670	0.4340	0.5660	0.0000	0.0000
Ba-133m	1.5910 d 0.79	8.3688E+14	0.1141	0.0668	0.2190	0.0000	0.0000
Ba-131	11.550 d 0.43	5.1903E+15	9.7436E-02	0.4580	0.0446	0.0000	0.0000
Cs-134m	2.9080 h 0.10	5.3304E+13	9.5387E-02	0.0268	0.1090	0.0000	0.0000
Eu-152	13.520 y 0.10	2.0605E+18	9.0474E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000 d 1.43	2.5746E+16	7.9750E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10 d 0.04	8.3010E+16	7.3735E-02	0.5900	0.0044	0.0020	0.0000
Br-82	1.4720 d 0.08	3.6731E+14	5.4105E-02	2.6600	0.1439	0.0000	0.0000
Xe-135	9.1390 h 0.22	8.3521E+13	4.7558E-02	0.2490	0.3190	0.0000	0.0000
Co-58m	8.9000 h 1.12	6.1413E+13	3.5908E-02	0.0019	0.0208	0.0000	0.0000
Tb-160	72.300 d 0.28	1.1718E+16	3.5141E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942 y 0.04	3.8666E+17	2.6709E-02	1.2500	0.2790	0.0000	0.0000
Ca-47	4.5380 d 0.04	4.6261E+14	2.2103E-02	1.0600	0.4004	0.0000	0.0000
Cs-131	9.6900 d 0.21	4.9435E+14	1.1062E-02	0.0230	0.0057	0.0000	0.0000
Cu-67	2.5790 d 0.16	1.2576E+14	1.0573E-02	0.1154	0.1416	0.0000	0.0000
Xe-133m	2.1880 d 0.50	8.6433E+13	8.5653E-03	0.0414	0.1920	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.0629E+14	8.3866E-03	0.1450	0.4080	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155340D+20

Total number of nuclides = 545
Total activity (Ci) = 3280.5

Total number of decays = 1.75652E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 25.577
Average chain length = 1.0247

Average gamma E (MeV) = 3.0898
Average beta E (MeV) = 0.74331
Average alpha E (MeV) = 2.99209E-09

Composite Exposure Rate Conversion Factor = 45.5704346 R/hr per Ci/m2
Composite ECF per FGR table = 51.5890694 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 38.6222420 Rem/hr per Ci/m2

Ground Source

Point in time = 2.00960112 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	4.3990E+18	1530.	4.1240	0.5546	0.0000	0.0000
K-42	12.360	h	0.02	1.0361E+18	436.2	0.2786	1.4310	0.0000	0.0000
Ar-37	35.030	d	0.09	4.2775E+18	26.48	0.0002	0.0019	0.0000	0.0000
Eu-152m	9.2750	h	0.10	2.9679E+16	16.65	0.3070	0.5070	0.0000	0.0000
La-140	1.6780	d	0.01	8.1182E+16	10.49	2.3200	0.5340	0.0000	0.0000
Np-239	2.3550	d	0.17	1.1376E+17	10.47	0.1740	0.1079	0.0000	0.0000
Cu-64	12.700	h	0.02	2.2040E+16	9.031	0.1920	0.0734	0.0490	0.0000
Sm-153	1.9280	d	0.01	7.5939E+16	8.540	0.0617	0.2700	0.0000	0.0000
Ga-72	14.100	h	0.07	1.2514E+16	4.619	2.7080	0.5028	0.0000	0.0000
Pa-233	27.000	d	0.37	3.4228E+17	2.749	0.2175	0.0664	0.0000	0.0000
Y-90	2.6710	d	0.12	2.3160E+16	1.880	0.0020	0.9336	0.0000	0.0000
As-76	1.0930	d	0.34	8.9581E+15	1.777	0.4300	1.0610	0.0000	0.0000
P-32	14.270	d	0.28	1.0657E+17	1.619	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	1.0857E+17	1.264	0.0957	0.6670	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.7180E+18	1.241	0.0016	0.0038	0.0000	0.0000
Sc-47	3.3510	d	0.06	1.8650E+16	1.207	0.1089	0.1619	0.0000	0.0000
Sc-46	83.780	d	0.02	3.8141E+17	0.9871	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490	d	0.02	1.6941E+17	0.8256	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0156E+17	0.7947	0.0328	0.0031	0.0000	0.0000
Zn-69	56.400	m	1.60	1.3564E+14	0.7509	0.0003	0.3216	0.0000	0.0000
Zn-69m	13.760	h	0.15	1.8505E+15	0.6998	0.4161	0.0226	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8476E+18	0.6587	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	1.2744E+17	0.6520	0.5180	0.1204	0.0000	0.0000
Ba-135m	1.1960	d	0.70	3.2451E+15	0.5883	0.0600	0.2070	0.0000	0.0000
Ca-45	163.00	d	0.61	3.6814E+17	0.4897	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.6015E+17	0.4585	0.8359	0.0034	0.0000	0.0000
Ta-182	114.70	d	0.35	2.1893E+17	0.4138	1.2910	0.2070	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000	0.0000
S-35	87.310	d	0.18	1.5383E+17	0.3820	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0585E+18	0.3043	1.5500	0.1640	0.0000	0.0000
Sb-122	2.7000	d	0.37	2.9995E+15	0.2409	0.4340	0.5660	0.0000	0.0000
Hf-180m	5.5000	h	1.82	2.0381E+14	0.1928	0.9980	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	5.6099E+13	0.1114	0.0018	0.5952	0.0000	0.0000
Ba-133m	1.5910	d	0.79	7.0288E+14	9.5790E-02	0.0668	0.2190	0.0000	0.0000
Ba-131	11.550	d	0.43	5.0670E+15	9.5122E-02	0.4580	0.0446	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0604E+18	9.0469E-02	1.1600	0.1270	0.0001	0.0000
Mn-56	2.5820	h	0.19	4.1944E+13	8.4536E-02	1.6910	0.8309	0.0000	0.0000
Hf-175	70.000	d	1.43	2.5645E+16	7.9434E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10	d	0.04	8.2915E+16	7.3651E-02	0.5900	0.0044	0.0020	0.0000
Br-82	1.4720	d	0.08	3.0418E+14	4.4805E-02	2.6600	0.1439	0.0000	0.0000
Tb-160	72.300	d	0.28	1.1673E+16	3.5007E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8663E+17	2.6707E-02	1.2500	0.2790	0.0000	0.0000
Xe-135	9.1390	h	0.22	4.0289E+13	2.2941E-02	0.2490	0.3190	0.0000	0.0000
Ca-47	4.5380	d	0.04	4.3516E+14	2.0792E-02	1.0600	0.4004	0.0000	0.0000
Co-58m	8.9000	h	1.12	2.9050E+13	1.6985E-02	0.0019	0.0208	0.0000	0.0000
Cs-131	9.6900	d	0.21	6.0190E+14	1.3468E-02	0.0230	0.0057	0.0000	0.0000
Cs-134m	2.9080	h	0.10	5.3917E+12	9.6484E-03	0.0268	0.1090	0.0000	0.0000
Cu-67	2.5790	d	0.16	1.1292E+14	9.4939E-03	0.1154	0.1416	0.0000	0.0000
Sb-124	60.200	d	0.05	2.2315E+15	8.0374E-03	1.8500	0.3900	0.0000	0.0000
Mo-99	2.7480	d	0.02	9.6077E+13	7.5807E-03	0.1450	0.4080	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 534
Total activity (Ci) = 2074.2

Total number of decays = 1.79019E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.067
Average chain length = 1.0247

Average gamma E (MeV) = 3.1277
Average beta E (MeV) = 0.72375
Average alpha E (MeV) = 5.62459E-09

Composite Exposure Rate Conversion Factor = 46.1269646 R/hr per Ci/m2
Composite ECF per FGR table = 52.2165337 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 39.0956535 Rem/hr per Ci/m2

Ground Source

Point in time = 2.50979114 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	2.5223E+18	877.4	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	5.2847E+17	222.5	0.2786	1.4310	0.0000
Ar-37	35.030	d	0.09	4.2354E+18	26.22	0.0002	0.0019	0.0000
Np-239	2.3550	d	0.17	9.8184E+16	9.040	0.1740	0.1079	0.0000
La-140	1.6780	d	0.01	6.6028E+16	8.532	2.3200	0.5340	0.0000
Sm-153	1.9280	d	0.01	6.3441E+16	7.135	0.0617	0.2700	0.0000
Eu-152m	9.2750	h	0.10	1.2101E+16	6.790	0.3070	0.5070	0.0000
Cu-64	12.700	h	0.02	1.1446E+16	4.690	0.1920	0.0734	0.0490
Pa-233	27.000	d	0.37	3.3792E+17	2.714	0.2175	0.0664	0.0000
Ga-72	14.100	h	0.07	6.9360E+15	2.560	2.7080	0.5028	0.0000
Y-90	2.6710	d	0.12	2.0341E+16	1.651	0.0020	0.9336	0.0000
P-32	14.270	d	0.28	1.0401E+17	1.580	0.0012	0.6949	0.0000
As-76	1.0930	d	0.34	6.5231E+15	1.294	0.4300	1.0610	0.0000
Fe-55	2.7351	y	0.80	5.7160E+18	1.241	0.0016	0.0038	0.0000
Rb-86	18.630	d	0.11	1.0657E+17	1.240	0.0957	0.6670	0.0000
Sc-47	3.3510	d	0.06	1.6847E+16	1.090	0.1089	0.1619	0.0000
Sc-46	83.780	d	0.02	3.7983E+17	0.9830	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.6810E+17	0.8192	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	1.0030E+17	0.7848	0.0328	0.0031	0.0000
Co-60	5.2701	y	0.02	5.8465E+18	0.6586	2.5030	0.0964	0.0000
Hf-181	42.380	d	0.14	1.2640E+17	0.6467	0.5180	0.1204	0.0000
Ca-45	163.00	d	0.61	3.6736E+17	0.4887	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.5942E+17	0.4580	0.8359	0.0034	0.0000
Ba-135m	1.1960	d	0.70	2.4284E+15	0.4403	0.0600	0.2070	0.0000
Ta-182	114.70	d	0.35	2.1826E+17	0.4126	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
Zn-69	56.400	m	1.60	7.4091E+13	0.4102	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	1.0108E+15	0.3823	0.4161	0.0226	0.0000
S-35	87.310	d	0.18	1.5322E+17	0.3805	0.0000	0.0486	0.0000
Cs-134	2.0650	y	0.03	1.0580E+18	0.3042	1.5500	0.1640	0.0000
Sb-122	2.7000	d	0.37	2.6381E+15	0.2119	0.4340	0.5660	0.0000
Ba-131	11.550	d	0.43	4.9172E+15	9.2309E-02	0.4580	0.0446	0.0000
Eu-152	13.520	y	0.10	2.0603E+18	9.0462E-02	1.1600	0.1270	0.0001
Hf-175	70.000	d	1.43	2.5518E+16	7.9042E-02	0.3518	0.0000	0.0000
Ba-133m	1.5910	d	0.79	5.6525E+14	7.7034E-02	0.0668	0.2190	0.0000
Zn-65	244.10	d	0.04	8.2798E+16	7.3546E-02	0.5900	0.0044	0.0020
Hf-180m	5.5000	h	1.82	4.4893E+13	4.2475E-02	0.9980	0.0000	0.0000
Br-82	1.4720	d	0.08	2.4035E+14	3.5403E-02	2.6600	0.1439	0.0000
Tb-160	72.300	d	0.28	1.1617E+16	3.4839E-02	1.1300	0.2540	0.0000
Eu-154	8.5942	y	0.04	3.8659E+17	2.6704E-02	1.2500	0.2790	0.0000
Ca-47	4.5380	d	0.04	4.0315E+14	1.9262E-02	1.0600	0.4004	0.0000
Cs-131	9.6900	d	0.21	7.2792E+14	1.6288E-02	0.0230	0.0057	0.0000
Xe-135	9.1390	h	0.22	1.6209E+13	9.2296E-03	0.2490	0.3190	0.0000
Cu-67	2.5790	d	0.16	9.8719E+13	8.2997E-03	0.1154	0.1416	0.0000
Sb-124	60.200	d	0.05	2.2187E+15	7.9913E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	2.4206E+15	7.4069E-03	0.9770	0.0036	0.0300
Xe-133	5.2440	d	0.08	1.6899E+14	6.9872E-03	0.0463	0.1360	0.0000
Mo-99	2.7480	d	0.02	8.4689E+13	6.6822E-03	0.1450	0.4080	0.0000
Co-58m	8.9000	h	1.12	1.1405E+13	6.6687E-03	0.0019	0.0208	0.0000
Tc-99m	6.0110	h	0.17	7.4652E+12	6.4627E-03	0.1240	0.0142	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 530
Total activity (Ci) = 1184.1

Total number of decays = 1.81555E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.437
Average chain length = 1.0247

Average gamma E (MeV) = 3.1420
Average beta E (MeV) = 0.69593
Average alpha E (MeV) = 1.15700E-08

Composite Exposure Rate Conversion Factor = 46.3456650 R/hr per Ci/m2
Composite ECF per FGR table = 52.4552994 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 39.2750130 Rem/hr per Ci/m2

Ground Source

Point in time = 3.13448501 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	1.2592E+18	438.0	4.1240	0.5546	0.0000
K-42	12.360	h	0.02	2.2797E+17	95.98	0.2786	1.4310	0.0000
Ar-37	35.030	d	0.09	4.1833E+18	25.89	0.0002	0.0019	0.0000
Np-239	2.3550	d	0.17	8.1694E+16	7.522	0.1740	0.1079	0.0000
La-140	1.6780	d	0.01	5.1010E+16	6.591	2.3200	0.5340	0.0000
Sm-153	1.9280	d	0.01	5.0679E+16	5.699	0.0617	0.2700	0.0000
Pa-233	27.000	d	0.37	3.3254E+17	2.670	0.2175	0.0664	0.0000
Eu-152m	9.2750	h	0.10	3.9467E+15	2.214	0.3070	0.5070	0.0000
Cu-64	12.700	h	0.02	5.0501E+15	2.069	0.1920	0.0734	0.0490
P-32	14.270	d	0.28	1.0091E+17	1.533	0.0012	0.6949	0.0000
Y-90	2.6710	d	0.12	1.7297E+16	1.404	0.0020	0.9336	0.0000
Fe-55	2.7351	y	0.80	5.7136E+18	1.240	0.0016	0.0038	0.0000
Ga-72	14.100	h	0.07	3.3191E+15	1.225	2.7080	0.5028	0.0000
Rb-86	18.630	d	0.11	1.0412E+17	1.212	0.0957	0.6670	0.0000
Sc-46	83.780	d	0.02	3.7787E+17	0.9779	2.0090	0.1118	0.0000
Sc-47	3.3510	d	0.06	1.4839E+16	0.9602	0.1089	0.1619	0.0000
As-76	1.0930	d	0.34	4.3894E+15	0.8708	0.4300	1.0610	0.0000
Fe-59	44.490	d	0.02	1.6647E+17	0.8113	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	9.8746E+16	0.7727	0.0328	0.0031	0.0000
Co-60	5.2701	y	0.02	5.8452E+18	0.6584	2.5030	0.0964	0.0000
Hf-181	42.380	d	0.14	1.2512E+17	0.6401	0.5180	0.1204	0.0000
Ca-45	163.00	d	0.61	3.6638E+17	0.4874	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.5850E+17	0.4573	0.8359	0.0034	0.0000
Ta-182	114.70	d	0.35	2.1744E+17	0.4110	1.2910	0.2070	0.0000
Ar-39	269.01	y	3.35	1.8610E+20	0.4107	0.0002	0.2188	0.0000
S-35	87.310	d	0.18	1.5246E+17	0.3786	0.0000	0.0486	0.0000
Ba-135m	1.1960	d	0.70	1.6908E+15	0.3065	0.0600	0.2070	0.0000
Cs-134	2.0650	y	0.03	1.0574E+18	0.3040	1.5500	0.1640	0.0000
Zn-69	56.400	m	1.60	3.4815E+13	0.1927	0.0003	0.3216	0.0000
Sb-122	2.7000	d	0.37	2.2472E+15	0.1805	0.4340	0.5660	0.0000
Zn-69m	13.760	h	0.15	4.7496E+14	0.1796	0.4161	0.0226	0.0000
Eu-152	13.520	y	0.10	2.0601E+18	9.0454E-02	1.1600	0.1270	0.0001
Ba-131	11.550	d	0.43	4.7363E+15	8.8913E-02	0.4580	0.0446	0.0000
Hf-175	70.000	d	1.43	2.5361E+16	7.8554E-02	0.3518	0.0000	0.0000
Zn-65	244.10	d	0.04	8.2651E+16	7.3416E-02	0.5900	0.0044	0.0020
Ba-133m	1.5910	d	0.79	4.3057E+14	5.8679E-02	0.0668	0.2190	0.0000
Tb-160	72.300	d	0.28	1.1548E+16	3.4631E-02	1.1300	0.2540	0.0000
Eu-154	8.5942	y	0.04	3.8653E+17	2.6700E-02	1.2500	0.2790	0.0000
Br-82	1.4720	d	0.08	1.7910E+14	2.6381E-02	2.6600	0.1439	0.0000
Cs-131	9.6900	d	0.21	8.7303E+14	1.9535E-02	0.0230	0.0057	0.0000
Ca-47	4.5380	d	0.04	3.6646E+14	1.7509E-02	1.0600	0.4004	0.0000
Sb-124	60.200	d	0.05	2.2028E+15	7.9340E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	2.4137E+15	7.3857E-03	0.9770	0.0036	0.0300
Cu-67	2.5790	d	0.16	8.3461E+13	7.0169E-03	0.1154	0.1416	0.0000
Xe-133	5.2440	d	0.08	1.6678E+14	6.8958E-03	0.0463	0.1360	0.0000
Hf-180m	5.5000	h	1.82	6.7856E+12	6.4201E-03	0.9980	0.0000	0.0000
Mo-99	2.7480	d	0.02	7.2342E+13	5.7080E-03	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	6.3860E+12	5.5285E-03	0.1240	0.0142	0.0000
Xe-133m	2.1880	d	0.50	5.3310E+13	5.2829E-03	0.0414	0.1920	0.0000
Ag-110m	249.80	d	0.01	5.1094E+15	4.4349E-03	2.7400	0.0755	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155344D+20

Total number of nuclides = 524
Total activity (Ci) = 602.87

Total number of decays = 1.83269E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.686
Average chain length = 1.0247

Average gamma E (MeV) = 3.0895
Average beta E (MeV) = 0.65281
Average alpha E (MeV) = 2.63197E-08

Composite Exposure Rate Conversion Factor = 45.5976028 R/hr per Ci/m2
Composite ECF per FGR table = 51.5884094 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 38.6192894 Rem/hr per Ci/m2

Ground Source

Point in time = 3.91466618 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Na-24	14.960 h 0.01	5.2884E+17	184.0	4.1240	0.5546	0.0000	0.0000
K-42	12.360 h 0.02	7.9769E+16	33.58	0.2786	1.4310	0.0000	0.0000
Ar-37	35.030 d 0.09	4.1192E+18	25.50	0.0002	0.0019	0.0000	0.0000
Np-239	2.3550 d 0.17	6.4933E+16	5.978	0.1740	0.1079	0.0000	0.0000
La-140	1.6780 d 0.01	3.6957E+16	4.775	2.3200	0.5340	0.0000	0.0000
Sm-153	1.9280 d 0.01	3.8284E+16	4.305	0.0617	0.2700	0.0000	0.0000
Pa-233	27.000 d 0.37	3.2595E+17	2.618	0.2175	0.0664	0.0000	0.0000
P-32	14.270 d 0.28	9.7153E+16	1.476	0.0012	0.6949	0.0000	0.0000
Fe-55	2.7351 y 0.80	5.7105E+18	1.239	0.0016	0.0038	0.0000	0.0000
Rb-86	18.630 d 0.11	1.0114E+17	1.177	0.0957	0.6670	0.0000	0.0000
Y-90	2.6710 d 0.12	1.4127E+16	1.147	0.0020	0.9336	0.0000	0.0000
Sc-46	83.780 d 0.02	3.7544E+17	0.9717	2.0090	0.1118	0.0000	0.0000
Sc-47	3.3510 d 0.06	1.2666E+16	0.8195	0.1089	0.1619	0.0000	0.0000
Fe-59	44.490 d 0.02	1.6446E+17	0.8015	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710 d 0.01	9.6838E+16	0.7577	0.0328	0.0031	0.0000	0.0000
Cu-64	12.700 h 0.02	1.8175E+15	0.7447	0.1920	0.0734	0.0490	0.0000
Co-60	5.2701 y 0.02	5.8436E+18	0.6582	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380 d 0.14	1.2353E+17	0.6320	0.5180	0.1204	0.0000	0.0000
Eu-152m	9.2750 h 0.10	9.7390E+14	0.5464	0.3070	0.5070	0.0000	0.0000
As-76	1.0930 d 0.34	2.6763E+15	0.5309	0.4300	1.0610	0.0000	0.0000
Ga-72	14.100 h 0.07	1.3221E+15	0.4879	2.7080	0.5028	0.0000	0.0000
Ca-45	163.00 d 0.61	3.6517E+17	0.4858	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20 d 0.01	6.5736E+17	0.4565	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01 y 3.35	1.8609E+20	0.4107	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70 d 0.35	2.1642E+17	0.4091	1.2910	0.2070	0.0000	0.0000
S-35	87.310 d 0.18	1.5152E+17	0.3763	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650 y 0.03	1.0567E+18	0.3038	1.5500	0.1640	0.0000	0.0000
Ba-135m	1.1960 d 0.70	1.0758E+15	0.1950	0.0600	0.2070	0.0000	0.0000
Sb-122	2.7000 d 0.37	1.8393E+15	0.1477	0.4340	0.5660	0.0000	0.0000
Eu-152	13.520 y 0.10	2.0599E+18	9.0445E-02	1.1600	0.1270	0.0001	0.0000
Ba-131	11.550 d 0.43	4.5196E+15	8.4846E-02	0.4580	0.0446	0.0000	0.0000
Hf-175	70.000 d 1.43	2.5165E+16	7.7950E-02	0.3518	0.0000	0.0000	0.0000
Zn-69	56.400 m 1.60	1.3556E+13	7.5045E-02	0.0003	0.3216	0.0000	0.0000
Zn-65	244.10 d 0.04	8.2468E+16	7.3254E-02	0.5900	0.0044	0.0020	0.0000
Zn-69m	13.760 h 0.15	1.8494E+14	6.9940E-02	0.4161	0.0226	0.0000	0.0000
Ba-133m	1.5910 d 0.79	3.0650E+14	4.1770E-02	0.0668	0.2190	0.0000	0.0000
Tb-160	72.300 d 0.28	1.1462E+16	3.4373E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942 y 0.04	3.8647E+17	2.6695E-02	1.2500	0.2790	0.0000	0.0000
Cs-131	9.6900 d 0.21	1.0363E+15	2.3189E-02	0.0230	0.0057	0.0000	0.0000
Br-82	1.4720 d 0.08	1.2403E+14	1.8270E-02	2.6600	0.1439	0.0000	0.0000
Ca-47	4.5380 d 0.04	3.2529E+14	1.5542E-02	1.0600	0.4004	0.0000	0.0000
Sb-124	60.200 d 0.05	2.1831E+15	7.8630E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860 d 0.10	2.3981E+15	7.3379E-03	0.9770	0.0036	0.0300	0.0000
Xe-133	5.2440 d 0.08	1.6150E+14	6.6778E-03	0.0463	0.1360	0.0000	0.0000
Cu-67	2.5790 d 0.16	6.7674E+13	5.6896E-03	0.1154	0.1416	0.0000	0.0000
Mo-99	2.7480 d 0.02	5.9419E+13	4.6884E-03	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	5.2469E+12	4.5424E-03	0.1240	0.0142	0.0000	0.0000
Ag-110m	249.80 d 0.01	5.0983E+15	4.4253E-03	2.7400	0.0755	0.0000	0.0000
Xe-133m	2.1880 d 0.50	4.1636E+13	4.1261E-03	0.0414	0.1920	0.0000	0.0000
Zr-95	64.030 d 0.01	9.4030E+14	3.1841E-03	0.7328	0.1200	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155347D+20

Total number of nuclides = 518
Total activity (Ci) = 276.19

Total number of decays = 1.84306E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.837
Average chain length = 1.0247

Average gamma E (MeV) = 2.8597
Average beta E (MeV) = 0.57821
Average alpha E (MeV) = 6.55003E-08

Composite Exposure Rate Conversion Factor = 42.2753639 R/hr per Ci/m2
Composite ECF per FGR table = 47.7834396 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 35.7463570 Rem/hr per Ci/m2

Ground Source

Point in time = 4.88902712 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Na-24	14.960	h	0.01	1.7897E+17	62.25	4.1240	0.5546	0.0000
Ar-37	35.030	d	0.09	4.0406E+18	25.01	0.0002	0.0019	0.0000
K-42	12.360	h	0.02	2.1493E+16	9.049	0.2786	1.4310	0.0000
Np-239	2.3550	d	0.17	4.8743E+16	4.488	0.1740	0.1079	0.0000
La-140	1.6780	d	0.01	2.4711E+16	3.193	2.3200	0.5340	0.0000
Sm-153	1.9280	d	0.01	2.6970E+16	3.033	0.0617	0.2700	0.0000
Pa-233	27.000	d	0.37	3.1790E+17	2.553	0.2175	0.0664	0.0000
P-32	14.270	d	0.28	9.2662E+16	1.408	0.0012	0.6949	0.0000
Fe-55	2.7351	y	0.80	5.7066E+18	1.239	0.0016	0.0038	0.0000
Rb-86	18.630	d	0.11	9.7543E+16	1.135	0.0957	0.6670	0.0000
Sc-46	83.780	d	0.02	3.7243E+17	0.9639	2.0090	0.1118	0.0000
Y-90	2.6710	d	0.12	1.0970E+16	0.8906	0.0020	0.9336	0.0000
Fe-59	44.490	d	0.02	1.6198E+17	0.7894	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	9.4506E+16	0.7395	0.0328	0.0031	0.0000
Sc-47	3.3510	d	0.06	1.0394E+16	0.6726	0.1089	0.1619	0.0000
Co-60	5.2701	y	0.02	5.8415E+18	0.6580	2.5030	0.0964	0.0000
Hf-181	42.380	d	0.14	1.2158E+17	0.6220	0.5180	0.1204	0.0000
Ca-45	163.00	d	0.61	3.6366E+17	0.4837	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.5594E+17	0.4556	0.8359	0.0034	0.0000
Ar-39	269.01	y	3.35	1.8609E+20	0.4107	0.0002	0.2188	0.0000
Ta-182	114.70	d	0.35	2.1515E+17	0.4067	1.2910	0.2070	0.0000
S-35	87.310	d	0.18	1.5035E+17	0.3734	0.0000	0.0486	0.0000
Cs-134	2.0650	y	0.03	1.0557E+18	0.3035	1.5500	0.1640	0.0000
As-76	1.0930	d	0.34	1.4427E+15	0.2862	0.4300	1.0610	0.0000
Cu-64	12.700	h	0.02	5.0720E+14	0.2078	0.1920	0.0734	0.0000
Ga-72	14.100	h	0.07	4.1880E+14	0.1546	2.7080	0.5028	0.0000
Sb-122	2.7000	d	0.37	1.4323E+15	0.1150	0.4340	0.5660	0.0000
Ba-135m	1.1960	d	0.70	6.1162E+14	0.1109	0.0600	0.2070	0.0000
Eu-152m	9.2750	h	0.10	1.6964E+14	9.5180E-02	0.3070	0.5070	0.0000
Eu-152	13.520	y	0.10	2.0596E+18	9.0432E-02	1.1600	0.1270	0.0001
Ba-131	11.550	d	0.43	4.2629E+15	8.0027E-02	0.4580	0.0446	0.0000
Hf-175	70.000	d	1.43	2.4924E+16	7.7201E-02	0.3518	0.0000	0.0000
Zn-65	244.10	d	0.04	8.2240E+16	7.3051E-02	0.5900	0.0044	0.0000
Tb-160	72.300	d	0.28	1.1355E+16	3.4054E-02	1.1300	0.2540	0.0000
Ba-133m	1.5910	d	0.79	2.0048E+14	2.7322E-02	0.0668	0.2190	0.0000
Cs-131	9.6900	d	0.21	1.2144E+15	2.7174E-02	0.0230	0.0057	0.0000
Eu-154	8.5942	y	0.04	3.8638E+17	2.6690E-02	1.2500	0.2790	0.0000
Zn-69	56.400	m	1.60	4.1739E+12	2.3106E-02	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	5.6942E+13	2.1534E-02	0.4161	0.0226	0.0000
Ca-47	4.5380	d	0.04	2.8031E+14	1.3393E-02	1.0600	0.4004	0.0000
Br-82	1.4720	d	0.08	7.8392E+13	1.1547E-02	2.6600	0.1439	0.0000
Sb-124	60.200	d	0.05	2.1588E+15	7.7753E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	2.3760E+15	7.2704E-03	0.9770	0.0036	0.0000
Xe-133	5.2440	d	0.08	1.5233E+14	6.2984E-03	0.0463	0.1360	0.0000
Ag-110m	249.80	d	0.01	5.0846E+15	4.4134E-03	2.7400	0.0755	0.0000
Cu-67	2.5790	d	0.16	5.2082E+13	4.3787E-03	0.1154	0.1416	0.0000
Mo-99	2.7480	d	0.02	4.6472E+13	3.6668E-03	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	4.1038E+12	3.5528E-03	0.1240	0.0142	0.0000
Zr-95	64.030	d	0.01	9.3043E+14	3.1507E-03	0.7328	0.1200	0.0000
Xe-133m	2.1880	d	0.50	3.0579E+13	3.0303E-03	0.0414	0.1920	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155344D+20

Total number of nuclides = 507
Total activity (Ci) = 122.67

Total number of decays = 1.84884E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.921
Average chain length = 1.0247

Average gamma E (MeV) = 2.2474
Average beta E (MeV) = 0.44520
Average alpha E (MeV) = 1.65230E-07

Composite Exposure Rate Conversion Factor = 33.3905830 R/hr per Ci/m2
Composite ECF per FGR table = 37.6381874 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 28.0926609 Rem/hr per Ci/m2

Ground Source

Point in time = 6.10591888 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.9444E+18	24.41	0.0002	0.0019	0.0000
Na-24	14.960	h	0.01	4.6248E+16	16.09	4.1240	0.5546	0.0000
Np-239	2.3550	d	0.17	3.4069E+16	3.137	0.1740	0.1079	0.0000
Pa-233	27.000	d	0.37	3.0812E+17	2.474	0.2175	0.0664	0.0000
Sm-153	1.9280	d	0.01	1.7413E+16	1.958	0.0617	0.2700	0.0000
La-140	1.6780	d	0.01	1.4948E+16	1.932	2.3200	0.5340	0.0000
K-42	12.360	h	0.02	4.1782E+15	1.759	0.2786	1.4310	0.0000
P-32	14.270	d	0.28	8.7344E+16	1.327	0.0012	0.6949	0.0000
Fe-55	2.7351	y	0.80	5.7018E+18	1.238	0.0016	0.0038	0.0000
Rb-86	18.630	d	0.11	9.3225E+16	1.085	0.0957	0.6670	0.0000
Sc-46	83.780	d	0.02	3.6870E+17	0.9542	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.5894E+17	0.7746	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	9.1672E+16	0.7173	0.0328	0.0031	0.0000
Co-60	5.2701	y	0.02	5.8390E+18	0.6577	2.5030	0.0964	0.0000
Y-90	2.6710	d	0.12	7.9998E+15	0.6494	0.0020	0.9336	0.0000
Hf-181	42.380	d	0.14	1.1918E+17	0.6098	0.5180	0.1204	0.0000
Sc-47	3.3510	d	0.06	8.1232E+15	0.5256	0.1089	0.1619	0.0000
Ca-45	163.00	d	0.61	3.6178E+17	0.4813	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.5417E+17	0.4543	0.8359	0.0034	0.0000
Ar-39	269.01	y	3.35	1.8609E+20	0.4107	0.0002	0.2188	0.0000
Ta-182	114.70	d	0.35	2.1357E+17	0.4037	1.2910	0.2070	0.0000
S-35	87.310	d	0.18	1.4890E+17	0.3698	0.0000	0.0486	0.0000
Cs-134	2.0650	y	0.03	1.0546E+18	0.3032	1.5500	0.1640	0.0000
As-76	1.0930	d	0.34	6.6684E+14	0.1323	0.4300	1.0610	0.0000
Eu-152	13.520	y	0.10	2.0592E+18	9.0417E-02	1.1600	0.1270	0.0001
Sb-122	2.7000	d	0.37	1.0480E+15	8.4157E-02	0.4340	0.5660	0.0000
Hf-175	70.000	d	1.43	2.4625E+16	7.6277E-02	0.3518	0.0000	0.0000
Ba-131	11.550	d	0.43	3.9627E+15	7.4391E-02	0.4580	0.0446	0.0000
Zn-65	244.10	d	0.04	8.1957E+16	7.2799E-02	0.5900	0.0044	0.0020
Ba-135m	1.1960	d	0.70	3.0213E+14	5.4773E-02	0.0600	0.2070	0.0000
Cu-64	12.700	h	0.02	1.0302E+14	4.2212E-02	0.1920	0.0734	0.0490
Ga-72	14.100	h	0.07	9.9652E+13	3.6778E-02	2.7080	0.5028	0.0000
Tb-160	72.300	d	0.28	1.1223E+16	3.3659E-02	1.1300	0.2540	0.0000
Cs-131	9.6900	d	0.21	1.4006E+15	3.1339E-02	0.0230	0.0057	0.0000
Eu-154	8.5942	y	0.04	3.8628E+17	2.6683E-02	1.2500	0.2790	0.0000
Ba-133m	1.5910	d	0.79	1.1798E+14	1.6079E-02	0.0668	0.2190	0.0000
Ca-47	4.5380	d	0.04	2.3276E+14	1.1121E-02	1.0600	0.4004	0.0000
Eu-152m	9.2750	h	0.10	1.9127E+13	1.0731E-02	0.3070	0.5070	0.0000
Sb-124	60.200	d	0.05	2.1287E+15	7.6671E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	2.3480E+15	7.1847E-03	0.9770	0.0036	0.0300
Br-82	1.4720	d	0.08	4.4199E+13	6.5105E-03	2.6600	0.1439	0.0000
Xe-133	5.2440	d	0.08	1.3869E+14	5.7343E-03	0.0463	0.1360	0.0000
Zn-69	56.400	m	1.60	9.5854E+11	5.3064E-03	0.0003	0.3216	0.0000
Zn-69m	13.760	h	0.15	1.3077E+13	4.9454E-03	0.4161	0.0226	0.0000
Ag-110m	249.80	d	0.01	5.0674E+15	4.3985E-03	2.7400	0.0755	0.0000
Cu-67	2.5790	d	0.16	3.7553E+13	3.1572E-03	0.1154	0.1416	0.0000
Zr-95	64.030	d	0.01	9.1825E+14	3.1095E-03	0.7328	0.1200	0.0000
Sr-89	50.570	d	0.06	6.7663E+14	2.9012E-03	0.0010	0.5830	0.0000
Mo-99	2.7480	d	0.02	3.4189E+13	2.6976E-03	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	3.0192E+12	2.6137E-03	0.1240	0.0142	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 505
Total activity (Ci) = 63.587

Total number of decays = 1.85222E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 26.971
Average chain length = 1.0247

Average gamma E (MeV) = 1.2495
Average beta E (MeV) = 0.26402
Average alpha E (MeV) = 3.50481E-07

Composite Exposure Rate Conversion Factor = 18.8749714 R/hr per Ci/m2
Composite ECF per FGR table = 21.0891724 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.6188774 Rem/hr per Ci/m2

Ground Source

Point in time = 7.62569809 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.8276E+18	23.69	0.0002	0.0019	0.0000
Na-24	14.960	h	0.01	8.5337E+15	2.968	4.1240	0.5546	0.0000
Pa-233	27.000	d	0.37	2.9633E+17	2.380	0.2175	0.0664	0.0000
Np-239	2.3550	d	0.17	2.1782E+16	2.005	0.1740	0.1079	0.0000
Fe-55	2.7351	y	0.80	5.6958E+18	1.236	0.0016	0.0038	0.0000
P-32	14.270	d	0.28	8.1128E+16	1.233	0.0012	0.6949	0.0000
Sm-153	1.9280	d	0.01	1.0083E+16	1.134	0.0617	0.2700	0.0000
La-140	1.6780	d	0.01	7.9789E+15	1.031	2.3200	0.5340	0.0000
Rb-86	18.630	d	0.11	8.8100E+16	1.025	0.0957	0.6670	0.0000
Sc-46	83.780	d	0.02	3.6409E+17	0.9423	2.0090	0.1118	0.0000
Fe-59	44.490	d	0.02	1.5522E+17	0.7565	1.1880	0.1176	0.0000
Cr-51	27.710	d	0.01	8.8253E+16	0.6906	0.0328	0.0031	0.0000
Co-60	5.2701	y	0.02	5.8358E+18	0.6574	2.5030	0.0964	0.0000
Hf-181	42.380	d	0.14	1.1626E+17	0.5948	0.5180	0.1204	0.0000
Ca-45	163.00	d	0.61	3.5945E+17	0.4781	0.0000	0.0769	0.0000
Mn-54	312.20	d	0.01	6.5197E+17	0.4528	0.8359	0.0034	0.0000
Y-90	2.6710	d	0.12	5.3925E+15	0.4378	0.0020	0.9336	0.0000
Ar-39	269.01	y	3.35	1.8609E+20	0.4107	0.0002	0.2188	0.0000
Ta-182	114.70	d	0.35	2.1162E+17	0.4000	1.2910	0.2070	0.0000
Sc-47	3.3510	d	0.06	5.9731E+15	0.3865	0.1089	0.1619	0.0000
S-35	87.310	d	0.18	1.4712E+17	0.3654	0.0000	0.0486	0.0000
Cs-134	2.0650	y	0.03	1.0531E+18	0.3027	1.5500	0.1640	0.0000
K-42	12.360	h	0.02	5.4031E+14	0.2275	0.2786	1.4310	0.0000
Eu-152	13.520	y	0.10	2.0588E+18	9.0397E-02	1.1600	0.1270	0.0001
Hf-175	70.000	d	1.43	2.4257E+16	7.5137E-02	0.3518	0.0000	0.0000
Zn-65	244.10	d	0.04	8.1604E+16	7.2486E-02	0.5900	0.0044	0.0000
Ba-131	11.550	d	0.43	3.6173E+15	6.7906E-02	0.4580	0.0446	0.0000
Sb-122	2.7000	d	0.37	7.0942E+14	5.6970E-02	0.4340	0.5660	0.0000
As-76	1.0930	d	0.34	2.5436E+14	5.0459E-02	0.4300	1.0610	0.0000
Cs-131	9.6900	d	0.21	1.5833E+15	3.5429E-02	0.0230	0.0057	0.0000
Tb-160	72.300	d	0.28	1.1061E+16	3.3172E-02	1.1300	0.2540	0.0000
Eu-154	8.5942	y	0.04	3.8615E+17	2.6674E-02	1.2500	0.2790	0.0000
Ba-135m	1.1960	d	0.70	1.2522E+14	2.2701E-02	0.0600	0.2070	0.0000
Ca-47	4.5380	d	0.04	1.8454E+14	8.8175E-03	1.0600	0.4004	0.0000
Ba-133m	1.5910	d	0.79	6.0852E+13	8.2930E-03	0.0668	0.2190	0.0000
Sb-124	60.200	d	0.05	2.0918E+15	7.5341E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	2.3134E+15	7.0787E-03	0.9770	0.0036	0.0300
Ga-72	14.100	h	0.07	1.6587E+13	6.1216E-03	2.7080	0.5028	0.0000
Cu-64	12.700	h	0.02	1.4072E+13	5.7660E-03	0.1920	0.0734	0.0490
Xe-133	5.2440	d	0.08	1.2059E+14	4.9860E-03	0.0463	0.1360	0.0000
Ag-110m	249.80	d	0.01	5.0461E+15	4.3800E-03	2.7400	0.0755	0.0000
Br-82	1.4720	d	0.08	2.1608E+13	3.1828E-03	2.6600	0.1439	0.0000
Zr-95	64.030	d	0.01	9.0327E+14	3.0588E-03	0.7328	0.1200	0.0000
Sr-89	50.570	d	0.06	6.6268E+14	2.8413E-03	0.0010	0.5830	0.0000
Sr-85	64.850	d	0.01	7.1763E+14	2.3994E-03	0.5180	0.0081	0.0000
Cu-67	2.5790	d	0.16	2.4961E+13	2.0985E-03	0.1154	0.1416	0.0000
Mo-99	2.7480	d	0.02	2.3303E+13	1.8386E-03	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	2.0578E+12	1.7815E-03	0.1240	0.0142	0.0000
Se-75	119.70	d	0.20	9.4494E+14	1.7117E-03	0.3889	0.0000	0.0000
Xe-133m	2.1880	d	0.50	1.2850E+13	1.2734E-03	0.0414	0.1920	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 500
Total activity (Ci) = 44.420

Total number of decays = 1.85474E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.007
Average chain length = 1.0247

Average gamma E (MeV) = 0.50247
Average beta E (MeV) = 0.13541
Average alpha E (MeV) = 5.41204E-07

Composite Exposure Rate Conversion Factor = 7.97884226 R/hr per Ci/m2
Composite ECF per FGR table = 8.68371487 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.28092575 Rem/hr per Ci/m2

Ground Source

Point in time = 9.52373600 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.6865E+18	22.82	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	2.8223E+17	2.267	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6883E+18	1.235	0.0016	0.0038	0.0000	0.0000
Np-239	2.3550	d	0.17	1.2459E+16	1.147	0.1740	0.1079	0.0000	0.0000
P-32	14.270	d	0.28	7.3983E+16	1.124	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	8.2093E+16	0.9554	0.0957	0.6670	0.0000	0.0000
Sc-46	83.780	d	0.02	3.5842E+17	0.9276	2.0090	0.1118	0.0000	0.0000
Fe-59	44.490	d	0.02	1.5070E+17	0.7344	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	8.4161E+16	0.6585	0.0328	0.0031	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8318E+18	0.6569	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	1.1270E+17	0.5766	0.5180	0.1204	0.0000	0.0000
Sm-153	1.9280	d	0.01	5.0961E+15	0.5731	0.0617	0.2700	0.0000	0.0000
Ca-45	163.00	d	0.61	3.5656E+17	0.4743	0.0000	0.0769	0.0000	0.0000
La-140	1.6780	d	0.01	3.6428E+15	0.4707	2.3200	0.5340	0.0000	0.0000
Mn-54	312.20	d	0.01	6.4923E+17	0.4509	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8609E+20	0.4107	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70	d	0.35	2.0921E+17	0.3955	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.4492E+17	0.3599	0.0000	0.0486	0.0000	0.0000
Na-24	14.960	h	0.01	1.0340E+15	0.3597	4.1240	0.5546	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0512E+18	0.3022	1.5500	0.1640	0.0000	0.0000
Y-90	2.6710	d	0.12	3.2952E+15	0.2675	0.0020	0.9336	0.0000	0.0000
Sc-47	3.3510	d	0.06	4.0717E+15	0.2635	0.1089	0.1619	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0582E+18	9.0373E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000	d	1.43	2.3806E+16	7.3738E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10	d	0.04	8.1165E+16	7.2096E-02	0.5900	0.0044	0.0020	0.0000
Ba-131	11.550	d	0.43	3.2278E+15	6.0595E-02	0.4580	0.0446	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.7460E+15	3.9069E-02	0.0230	0.0057	0.0000	0.0000
Sb-122	2.7000	d	0.37	4.3580E+14	3.4997E-02	0.4340	0.5660	0.0000	0.0000
Tb-160	72.300	d	0.28	1.0862E+16	3.2574E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8599E+17	2.6662E-02	1.2500	0.2790	0.0000	0.0000
K-42	12.360	h	0.02	4.1995E+13	1.7681E-02	0.2786	1.4310	0.0000	0.0000
As-76	1.0930	d	0.34	7.6331E+13	1.5142E-02	0.4300	1.0610	0.0000	0.0000
Ba-135m	1.1960	d	0.70	4.1681E+13	7.5564E-03	0.0600	0.2070	0.0000	0.0000
Sb-124	60.200	d	0.05	2.0466E+15	7.3713E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	2.2708E+15	6.9485E-03	0.9770	0.0036	0.0300	0.0000
Ca-47	4.5380	d	0.04	1.3810E+14	6.5984E-03	1.0600	0.4004	0.0000	0.0000
Ag-110m	249.80	d	0.01	5.0196E+15	4.3570E-03	2.7400	0.0755	0.0000	0.0000
Xe-133	5.2440	d	0.08	9.8903E+13	4.0894E-03	0.0463	0.1360	0.0000	0.0000
Ba-133m	1.5910	d	0.79	2.6616E+13	3.6273E-03	0.0668	0.2190	0.0000	0.0000
Zr-95	64.030	d	0.01	8.8490E+14	2.9965E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	6.4567E+14	2.7684E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	7.0322E+14	2.3512E-03	0.5180	0.0081	0.0000	0.0000
Se-75	119.70	d	0.20	9.3461E+14	1.6930E-03	0.3889	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	8.8401E+12	1.3021E-03	2.6600	0.1439	0.0000	0.0000
Cu-67	2.5790	d	0.16	1.4987E+13	1.2600E-03	0.1154	0.1416	0.0000	0.0000
Mo-99	2.7480	d	0.02	1.4437E+13	1.1391E-03	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110	h	0.17	1.2749E+12	1.1037E-03	0.1240	0.0142	0.0000	0.0000
Nb-92m	10.150	d	0.20	4.4007E+13	9.4009E-04	0.9690	0.0056	0.0000	0.0000
Xe-133m	2.1880	d	0.50	7.0431E+12	6.9795E-04	0.0414	0.1920	0.0000	0.0000
Ga-72	14.100	h	0.07	1.7669E+12	6.5212E-04	2.7080	0.5028	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155356D+20

Total number of nuclides = 495
Total activity (Ci) = 37.953

Total number of decays = 1.85720E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.043
Average chain length = 1.0247

Average gamma E (MeV) = 0.25930
Average beta E (MeV) = 8.81580E-02
Average alpha E (MeV) = 6.70924E-07

Composite Exposure Rate Conversion Factor = 4.41652584 R/hr per Ci/m2
Composite ECF per FGR table = 4.63386679 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.24130082 Rem/hr per Ci/m2

Ground Source

Point in time = 11.8942184 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.5176E+18	21.77	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	2.6557E+17	2.133	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6789E+18	1.233	0.0016	0.0038	0.0000	0.0000
P-32	14.270	d	0.28	6.5936E+16	1.002	0.0012	0.6949	0.0000	0.0000
Sc-46	83.780	d	0.02	3.5146E+17	0.9096	2.0090	0.1118	0.0000	0.0000
Rb-86	18.630	d	0.11	7.5163E+16	0.8748	0.0957	0.6670	0.0000	0.0000
Fe-59	44.490	d	0.02	1.4523E+17	0.7078	1.1880	0.1176	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8268E+18	0.6564	2.5030	0.0964	0.0000	0.0000
Cr-51	27.710	d	0.01	7.9315E+16	0.6206	0.0328	0.0031	0.0000	0.0000
Np-239	2.3550	d	0.17	6.2011E+15	0.5709	0.1740	0.1079	0.0000	0.0000
Hf-181	42.380	d	0.14	1.0842E+17	0.5547	0.5180	0.1204	0.0000	0.0000
Ca-45	163.00	d	0.61	3.5299E+17	0.4695	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.4582E+17	0.4485	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8608E+20	0.4107	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70	d	0.35	2.0623E+17	0.3899	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.4222E+17	0.3532	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0490E+18	0.3015	1.5500	0.1640	0.0000	0.0000
Sm-153	1.9280	d	0.01	2.1733E+15	0.2444	0.0617	0.2700	0.0000	0.0000
La-140	1.6780	d	0.01	1.3683E+15	0.1768	2.3200	0.5340	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.5263E+15	0.1635	0.1089	0.1619	0.0000	0.0000
Y-90	2.6710	d	0.12	1.7812E+15	0.1446	0.0020	0.9336	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0576E+18	9.0343E-02	1.1600	0.1270	0.0001	0.0000
Hf-175	70.000	d	1.43	2.3253E+16	7.2028E-02	0.3518	0.0000	0.0000	0.0000
Zn-65	244.10	d	0.04	8.0621E+16	7.1612E-02	0.5900	0.0044	0.0020	0.0000
Ba-131	11.550	d	0.43	2.7998E+15	5.2560E-02	0.4580	0.0446	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.8666E+15	4.1767E-02	0.0230	0.0057	0.0000	0.0000
Tb-160	72.300	d	0.28	1.0618E+16	3.1842E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8579E+17	2.6648E-02	1.2500	0.2790	0.0000	0.0000
Na-24	14.960	h	0.01	7.4082E+13	2.5769E-02	4.1240	0.5546	0.0000	0.0000
Sb-122	2.7000	d	0.37	2.3713E+14	1.9043E-02	0.4340	0.5660	0.0000	0.0000
Sb-124	60.200	d	0.05	1.9915E+15	7.1728E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	2.2188E+15	6.7892E-03	0.9770	0.0036	0.0300	0.0000
Ca-47	4.5380	d	0.04	9.6150E+13	4.5940E-03	1.0600	0.4004	0.0000	0.0000
Ag-110m	249.80	d	0.01	4.9867E+15	4.3284E-03	2.7400	0.0755	0.0000	0.0000
As-76	1.0930	d	0.34	1.6976E+13	3.3676E-03	0.4300	1.0610	0.0000	0.0000
Xe-133	5.2440	d	0.08	7.5430E+13	3.1188E-03	0.0463	0.1360	0.0000	0.0000
Zr-95	64.030	d	0.01	8.6248E+14	2.9206E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	6.2503E+14	2.6799E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	6.8562E+14	2.2924E-03	0.5180	0.0081	0.0000	0.0000
Ba-135m	1.1960	d	0.70	1.0551E+13	1.9128E-03	0.0600	0.2070	0.0000	0.0000
Se-75	119.70	d	0.20	9.2187E+14	1.6699E-03	0.3889	0.0000	0.0000	0.0000
Ba-133m	1.5910	d	0.79	9.4762E+12	1.2914E-03	0.0668	0.2190	0.0000	0.0000
Nb-92m	10.150	d	0.20	3.7430E+13	7.9959E-04	0.9690	0.0056	0.0000	0.0000
K-42	12.360	h	0.02	1.7282E+12	7.2760E-04	0.2786	1.4310	0.0000	0.0000
Nb-95	34.990	d	0.02	1.1405E+14	7.0674E-04	0.7645	0.0434	0.0000	0.0000
Cu-67	2.5790	d	0.16	7.9254E+12	6.6631E-04	0.1154	0.1416	0.0000	0.0000
Mo-99	2.7480	d	0.02	7.9398E+12	6.2647E-04	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110	h	0.17	7.0115E+11	6.0699E-04	0.1240	0.0142	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7734E+15	5.9618E-04	0.0613	0.0650	0.0000	0.0000
Br-82	1.4720	d	0.08	2.8952E+12	4.2647E-04	2.6600	0.1439	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155344D+20

Total number of nuclides = 488
Total activity (Ci) = 34.619

Total number of decays = 1.85994E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.083
Average chain length = 1.0247

Average gamma E (MeV) = 0.21638
Average beta E (MeV) = 7.25685E-02
Average alpha E (MeV) = 7.66874E-07

Composite Exposure Rate Conversion Factor = 3.78876305 R/hr per Ci/m2
Composite ECF per FGR table = 3.91587353 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.70477629 Rem/hr per Ci/m2

Ground Source

Point in time = 14.8547211 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.3174E+18	20.53	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	2.4614E+17	1.977	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6673E+18	1.230	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.4295E+17	0.8876	2.0090	0.1118	0.0000	0.0000
P-32	14.270	d	0.28	5.7105E+16	0.8677	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	6.7323E+16	0.7835	0.0957	0.6670	0.0000	0.0000
Fe-59	44.490	d	0.02	1.3869E+17	0.6759	1.1880	0.1176	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8206E+18	0.6557	2.5030	0.0964	0.0000	0.0000
Cr-51	27.710	d	0.01	7.3654E+16	0.5763	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	1.0329E+17	0.5285	0.5180	0.1204	0.0000	0.0000
Ca-45	163.00	d	0.61	3.4857E+17	0.4637	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.4159E+17	0.4456	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8608E+20	0.4106	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70	d	0.35	2.0257E+17	0.3829	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.3891E+17	0.3450	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0461E+18	0.3007	1.5500	0.1640	0.0000	0.0000
Np-239	2.3550	d	0.17	2.5944E+15	0.2389	0.1740	0.1079	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0567E+18	9.0306E-02	1.1600	0.1270	0.0001	0.0000
Sc-47	3.3510	d	0.06	1.3950E+15	9.0260E-02	0.1089	0.1619	0.0000	0.0000
Sm-153	1.9280	d	0.01	7.4969E+14	8.4311E-02	0.0617	0.2700	0.0000	0.0000
Zn-65	244.10	d	0.04	7.9946E+16	7.1013E-02	0.5900	0.0044	0.0020	0.0000
Hf-175	70.000	d	1.43	2.2582E+16	6.9947E-02	0.3518	0.0000	0.0000	0.0000
Y-90	2.6710	d	0.12	8.2615E+14	6.7065E-02	0.0020	0.9336	0.0000	0.0000
La-140	1.6780	d	0.01	4.0278E+14	5.2046E-02	2.3200	0.5340	0.0000	0.0000
Ba-131	11.550	d	0.43	2.3441E+15	4.4005E-02	0.4580	0.0446	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.9198E+15	4.2958E-02	0.0230	0.0057	0.0000	0.0000
Tb-160	72.300	d	0.28	1.0320E+16	3.0951E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8554E+17	2.6631E-02	1.2500	0.2790	0.0000	0.0000
Sb-122	2.7000	d	0.37	1.1090E+14	8.9057E-03	0.4340	0.5660	0.0000	0.0000
Sb-124	60.200	d	0.05	1.9247E+15	6.9324E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	2.1554E+15	6.5955E-03	0.9770	0.0036	0.0300	0.0000
Ag-110m	249.80	d	0.01	4.9459E+15	4.2930E-03	2.7400	0.0755	0.0000	0.0000
Ca-47	4.5380	d	0.04	6.1173E+13	2.9229E-03	1.0600	0.4004	0.0000	0.0000
Zr-95	64.030	d	0.01	8.3528E+14	2.8285E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	6.0017E+14	2.5733E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	6.6427E+14	2.2210E-03	0.5180	0.0081	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.2627E+13	2.1760E-03	0.0463	0.1360	0.0000	0.0000
Se-75	119.70	d	0.20	9.0620E+14	1.6415E-03	0.3889	0.0000	0.0000	0.0000
Na-24	14.960	h	0.01	2.7541E+12	9.5801E-04	4.1240	0.5546	0.0000	0.0000
Nb-95	34.990	d	0.02	1.3419E+14	8.3155E-04	0.7645	0.0434	0.0000	0.0000
Nb-92m	10.150	d	0.20	3.0579E+13	6.5323E-04	0.9690	0.0056	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7678E+15	5.9548E-04	0.0613	0.0650	0.0000	0.0000
As-76	1.0930	d	0.34	2.5969E+12	5.1517E-04	0.4300	1.0610	0.0000	0.0000
C-14	5701.1	y	0.53	3.9560E+18	4.1193E-04	0.0000	0.0495	0.0000	0.0000
Ba-133m	1.5910	d	0.79	2.6091E+12	3.5557E-04	0.0668	0.2190	0.0000	0.0000
Ba-135m	1.1960	d	0.70	1.8973E+12	3.4397E-04	0.0600	0.2070	0.0000	0.0000
Cu-67	2.5790	d	0.16	3.5765E+12	3.0069E-04	0.1154	0.1416	0.0000	0.0000
Mo-99	2.7480	d	0.02	3.7627E+12	2.9689E-04	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110	h	0.17	3.3228E+11	2.8766E-04	0.1240	0.0142	0.0000	0.0000
Y-91	58.510	d	0.10	5.1614E+13	1.9127E-04	0.0046	0.6032	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 485
Total activity (Ci) = 32.021

Total number of decays = 1.86309E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.129
Average chain length = 1.0247

Average gamma E (MeV) = 0.21400
Average beta E (MeV) = 6.48771E-02
Average alpha E (MeV) = 8.54117E-07

Composite Exposure Rate Conversion Factor = 3.76864719 R/hr per Ci/m2
Composite ECF per FGR table = 3.88058615 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.67494535 Rem/hr per Ci/m2

Ground Source

Point in time = 18.5520649 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.0834E+18	19.09	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	2.2385E+17	1.798	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6528E+18	1.227	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.3262E+17	0.8608	2.0090	0.1118	0.0000	0.0000
P-32	14.270	d	0.28	4.7717E+16	0.7250	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	5.8671E+16	0.6828	0.0957	0.6670	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8129E+18	0.6548	2.5030	0.0964	0.0000	0.0000
Fe-59	44.490	d	0.02	1.3092E+17	0.6381	1.1880	0.1176	0.0000	0.0000
Cr-51	27.710	d	0.01	6.7147E+16	0.5254	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	9.7232E+16	0.4975	0.5180	0.1204	0.0000	0.0000
Ca-45	163.00	d	0.61	3.4313E+17	0.4564	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.3634E+17	0.4419	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8608E+20	0.4106	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70	d	0.35	1.9810E+17	0.3745	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.3489E+17	0.3350	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0426E+18	0.2997	1.5500	0.1640	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0556E+18	9.0259E-02	1.1600	0.1270	0.0001	0.0000
Np-239	2.3550	d	0.17	8.7383E+14	8.0453E-02	0.1740	0.1079	0.0000	0.0000
Zn-65	244.10	d	0.04	7.9111E+16	7.0271E-02	0.5900	0.0044	0.0020	0.0000
Hf-175	70.000	d	1.43	2.1770E+16	6.7432E-02	0.3518	0.0000	0.0000	0.0000
Sc-47	3.3510	d	0.06	6.6706E+14	4.3162E-02	0.1089	0.1619	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.8815E+15	4.2101E-02	0.0230	0.0057	0.0000	0.0000
Ba-131	11.550	d	0.43	1.8776E+15	3.5248E-02	0.4580	0.0446	0.0000	0.0000
Tb-160	72.300	d	0.28	9.9610E+15	2.9873E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8522E+17	2.6609E-02	1.2500	0.2790	0.0000	0.0000
Y-90	2.6710	d	0.12	3.1649E+14	2.5692E-02	0.0020	0.9336	0.0000	0.0000
Sm-153	1.9280	d	0.01	1.9842E+14	2.2315E-02	0.0617	0.2700	0.0000	0.0000
La-140	1.6780	d	0.01	8.7453E+13	1.1300E-02	2.3200	0.5340	0.0000	0.0000
Sb-124	60.200	d	0.05	1.8445E+15	6.6435E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	2.0789E+15	6.3612E-03	0.9770	0.0036	0.0300	0.0000
Ag-110m	249.80	d	0.01	4.8954E+15	4.2492E-03	2.7400	0.0755	0.0000	0.0000
Sb-122	2.7000	d	0.37	4.2923E+13	3.4470E-03	0.4340	0.5660	0.0000	0.0000
Zr-95	64.030	d	0.01	8.0251E+14	2.7175E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	5.7051E+14	2.4461E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	6.3853E+14	2.1349E-03	0.5180	0.0081	0.0000	0.0000
Ca-47	4.5380	d	0.04	3.4777E+13	1.6617E-03	1.0600	0.4004	0.0000	0.0000
Se-75	119.70	d	0.20	8.8700E+14	1.6067E-03	0.3889	0.0000	0.0000	0.0000
Xe-133	5.2440	d	0.08	3.2960E+13	1.3628E-03	0.0463	0.1360	0.0000	0.0000
Nb-95	34.990	d	0.02	1.5645E+14	9.6948E-04	0.7645	0.0434	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7607E+15	5.9460E-04	0.0613	0.0650	0.0000	0.0000
Nb-92m	10.150	d	0.20	2.3755E+13	5.0747E-04	0.9690	0.0056	0.0000	0.0000
C-14	5701.1	y	0.53	3.9560E+18	4.1193E-04	0.0000	0.0495	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3628E+15	1.8940E-04	0.4040	0.0547	0.0000	0.0000
Y-91	58.510	d	0.10	4.9402E+13	1.8307E-04	0.0046	0.6032	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2092E+16	1.4573E-04	0.0000	0.1250	0.0000	0.0000
Cs-136	13.030	d	0.54	8.3194E+12	1.3844E-04	2.1700	0.1350	0.0000	0.0000
Rb-84	33.500	d	1.79	1.8697E+13	1.2101E-04	0.8890	0.0171	0.1440	0.0000
Mo-99	2.7480	d	0.02	1.4807E+12	1.1683E-04	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110	h	0.17	1.3076E+11	1.1320E-04	0.1240	0.0142	0.0000	0.0000
Cu-67	2.5790	d	0.16	1.3240E+12	1.1131E-04	0.1154	0.1416	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 480
Total activity (Ci) = 29.595

Total number of decays = 1.86672E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.182
Average chain length = 1.0247

Average gamma E (MeV) = 0.22038
Average beta E (MeV) = 5.99541E-02
Average alpha E (MeV) = 9.44966E-07

Composite Exposure Rate Conversion Factor = 3.88774800 R/hr per Ci/m2
Composite ECF per FGR table = 3.99808288 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.75472307 Rem/hr per Ci/m2

Ground Source

Point in time = 23.1697197 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	2.8142E+18	17.42	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	1.9882E+17	1.597	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6347E+18	1.223	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.2015E+17	0.8286	2.0090	0.1118	0.0000	0.0000
Co-60	5.2701	y	0.02	5.8032E+18	0.6537	2.5030	0.0964	0.0000	0.0000
Fe-59	44.490	d	0.02	1.2183E+17	0.5938	1.1880	0.1176	0.0000	0.0000
P-32	14.270	d	0.28	3.8130E+16	0.5794	0.0012	0.6949	0.0000	0.0000
Rb-86	18.630	d	0.11	4.9409E+16	0.5751	0.0957	0.6670	0.0000	0.0000
Cr-51	27.710	d	0.01	5.9823E+16	0.4681	0.0328	0.0031	0.0000	0.0000
Hf-181	42.380	d	0.14	9.0159E+16	0.4613	0.5180	0.1204	0.0000	0.0000
Ca-45	163.00	d	0.61	3.3646E+17	0.4476	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.2985E+17	0.4374	0.8359	0.0034	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8607E+20	0.4106	0.0002	0.2188	0.0000	0.0000
Ta-182	114.70	d	0.35	1.9265E+17	0.3642	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.3004E+17	0.3229	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0381E+18	0.2984	1.5500	0.1640	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0543E+18	9.0200E-02	1.1600	0.1270	0.0001	0.0000
Zn-65	244.10	d	0.04	7.8080E+16	6.9356E-02	0.5900	0.0044	0.0020	0.0000
Hf-175	70.000	d	1.43	2.0797E+16	6.4418E-02	0.3518	0.0000	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.7363E+15	3.8852E-02	0.0230	0.0057	0.0000	0.0000
Tb-160	72.300	d	0.28	9.5297E+15	2.8579E-02	1.1300	0.2540	0.0000	0.0000
Ba-131	11.550	d	0.43	1.4232E+15	2.6717E-02	0.4580	0.0446	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8483E+17	2.6582E-02	1.2500	0.2790	0.0000	0.0000
Np-239	2.3550	d	0.17	2.2448E+14	2.0668E-02	0.1740	0.1079	0.0000	0.0000
Sc-47	3.3510	d	0.06	2.6737E+14	1.7300E-02	0.1089	0.1619	0.0000	0.0000
Y-90	2.6710	d	0.12	9.5485E+13	7.7512E-03	0.0020	0.9336	0.0000	0.0000
Sb-124	60.200	d	0.05	1.7490E+15	6.2995E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	1.9871E+15	6.0802E-03	0.9770	0.0036	0.0300	0.0000
Sm-153	1.9280	d	0.01	3.7724E+13	4.2424E-03	0.0617	0.2700	0.0000	0.0000
Ag-110m	249.80	d	0.01	4.8331E+15	4.1951E-03	2.7400	0.0755	0.0000	0.0000
Zr-95	64.030	d	0.01	7.6338E+14	2.5850E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	5.3552E+14	2.2961E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	6.0778E+14	2.0321E-03	0.5180	0.0081	0.0000	0.0000
La-140	1.6780	d	0.01	1.2983E+13	1.6776E-03	2.3200	0.5340	0.0000	0.0000
Se-75	119.70	d	0.20	8.6360E+14	1.5643E-03	0.3889	0.0000	0.0000	0.0000
Nb-95	34.990	d	0.02	1.8023E+14	1.1169E-03	0.7645	0.0434	0.0000	0.0000
Sb-122	2.7000	d	0.37	1.3118E+13	1.0534E-03	0.4340	0.5660	0.0000	0.0000
Ca-47	4.5380	d	0.04	1.7178E+13	8.2078E-04	1.0600	0.4004	0.0000	0.0000
Xe-133	5.2440	d	0.08	1.8118E+13	7.4913E-04	0.0463	0.1360	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7519E+15	5.9350E-04	0.0613	0.0650	0.0000	0.0000
C-14	5701.1	y	0.53	3.9560E+18	4.1193E-04	0.0000	0.0495	0.0000	0.0000
Nb-92m	10.150	d	0.20	1.7331E+13	3.7022E-04	0.9690	0.0056	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3604E+15	1.8927E-04	0.4040	0.0547	0.0000	0.0000
Y-91	58.510	d	0.10	4.6772E+13	1.7333E-04	0.0046	0.6032	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2089E+16	1.4572E-04	0.0000	0.1250	0.0000	0.0000
Rb-84	33.500	d	1.79	1.6993E+13	1.0999E-04	0.8890	0.0171	0.1440	0.0000
Cs-136	13.030	d	0.54	6.5074E+12	1.0829E-04	2.1700	0.1350	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8958E+15	1.0469E-04	0.0022	0.2507	0.0000	0.0000
Sm-145	340.00	d	0.88	1.1141E+14	7.1049E-05	0.0652	0.0293	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 476
Total activity (Ci) = 27.108

Total number of decays = 1.87090E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.243
Average chain length = 1.0247

Average gamma E (MeV) = 0.23094
Average beta E (MeV) = 5.63380E-02
Average alpha E (MeV) = 1.05123E-06

Composite Exposure Rate Conversion Factor = 4.07630062 R/hr per Ci/m2
Composite ECF per FGR table = 4.19039106 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.88675165 Rem/hr per Ci/m2

Ground Source

Point in time = 28.9367237 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	2.5107E+18	15.54	0.0002	0.0019	0.0000	0.0000
Pa-233	27.000	d	0.37	1.7146E+17	1.377	0.2175	0.0664	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.6122E+18	1.218	0.0016	0.0038	0.0000	0.0000
Sc-46	83.780	d	0.02	3.0524E+17	0.7900	2.0090	0.1118	0.0000	0.0000
Co-60	5.2701	y	0.02	5.7912E+18	0.6523	2.5030	0.0964	0.0000	0.0000
Fe-59	44.490	d	0.02	1.1136E+17	0.5427	1.1880	0.1176	0.0000	0.0000
Rb-86	18.630	d	0.11	3.9868E+16	0.4640	0.0957	0.6670	0.0000	0.0000
P-32	14.270	d	0.28	2.8814E+16	0.4378	0.0012	0.6949	0.0000	0.0000
Ca-45	163.00	d	0.61	3.2831E+17	0.4367	0.0000	0.0769	0.0000	0.0000
Mn-54	312.20	d	0.01	6.2184E+17	0.4319	0.8359	0.0034	0.0000	0.0000
Hf-181	42.380	d	0.14	8.2044E+16	0.4198	0.5180	0.1204	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8606E+20	0.4106	0.0002	0.2188	0.0000	0.0000
Cr-51	27.710	d	0.01	5.1786E+16	0.4052	0.0328	0.0031	0.0000	0.0000
Ta-182	114.70	d	0.35	1.8605E+17	0.3517	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	1.2422E+17	0.3085	0.0000	0.0486	0.0000	0.0000
Cs-134	2.0650	y	0.03	1.0327E+18	0.2969	1.5500	0.1640	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0526E+18	9.0127E-02	1.1600	0.1270	0.0001	0.0000
Zn-65	244.10	d	0.04	7.6812E+16	6.8229E-02	0.5900	0.0044	0.0020	0.0000
Hf-175	70.000	d	1.43	1.9643E+16	6.0843E-02	0.3518	0.0000	0.0000	0.0000
Cs-131	9.6900	d	0.21	1.4865E+15	3.3263E-02	0.0230	0.0057	0.0000	0.0000
Tb-160	72.300	d	0.28	9.0171E+15	2.7042E-02	1.1300	0.2540	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8434E+17	2.6548E-02	1.2500	0.2790	0.0000	0.0000
Ba-131	11.550	d	0.43	1.0068E+15	1.8901E-02	0.4580	0.0446	0.0000	0.0000
Sb-124	60.200	d	0.05	1.6366E+15	5.8948E-03	1.8500	0.3900	0.0000	0.0000
Co-58	70.860	d	0.10	1.8781E+15	5.7467E-03	0.9770	0.0036	0.0300	0.0000
Sc-47	3.3510	d	0.06	8.6493E+13	5.5965E-03	0.1089	0.1619	0.0000	0.0000
Ag-110m	249.80	d	0.01	4.7563E+15	4.1285E-03	2.7400	0.0755	0.0000	0.0000
Np-239	2.3550	d	0.17	4.1115E+13	3.7854E-03	0.1740	0.1079	0.0000	0.0000
Zr-95	64.030	d	0.01	7.1718E+14	2.4286E-03	0.7328	0.1200	0.0000	0.0000
Sr-89	50.570	d	0.06	4.9482E+14	2.1216E-03	0.0010	0.5830	0.0000	0.0000
Sr-85	64.850	d	0.01	5.7145E+14	1.9106E-03	0.5180	0.0081	0.0000	0.0000
Y-90	2.6710	d	0.12	2.1378E+13	1.7354E-03	0.0020	0.9336	0.0000	0.0000
Se-75	119.70	d	0.20	8.3524E+14	1.5130E-03	0.3889	0.0000	0.0000	0.0000
Nb-95	34.990	d	0.02	2.0445E+14	1.2669E-03	0.7645	0.0434	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7410E+15	5.9214E-04	0.0613	0.0650	0.0000	0.0000
Sm-153	1.9280	d	0.01	4.7443E+12	5.3355E-04	0.0617	0.2700	0.0000	0.0000
C-14	5701.1	y	0.53	3.9560E+18	4.1193E-04	0.0000	0.0495	0.0000	0.0000
Xe-133	5.2440	d	0.08	8.5029E+12	3.5157E-04	0.0463	0.1360	0.0000	0.0000
Ca-47	4.5380	d	0.04	7.1191E+12	3.4015E-04	1.0600	0.4004	0.0000	0.0000
Nb-92m	10.150	d	0.20	1.1689E+13	2.4970E-04	0.9690	0.0056	0.0000	0.0000
Sb-122	2.7000	d	0.37	2.9846E+12	2.3968E-04	0.4340	0.5660	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3570E+15	1.8907E-04	0.4040	0.0547	0.0000	0.0000
Y-91	58.510	d	0.10	4.3683E+13	1.6188E-04	0.0046	0.6032	0.0000	0.0000
La-140	1.6780	d	0.01	1.1989E+12	1.5492E-04	2.3200	0.5340	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2087E+16	1.4570E-04	0.0000	0.1250	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8939E+15	1.0458E-04	0.0022	0.2507	0.0000	0.0000
Rb-84	33.500	d	1.79	1.5082E+13	9.7615E-05	0.8890	0.0171	0.1440	0.0000
Cs-136	13.030	d	0.54	4.7882E+12	7.9679E-05	2.1700	0.1350	0.0000	0.0000
Sm-145	340.00	d	0.88	1.1011E+14	7.0219E-05	0.0652	0.0293	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 468
Total activity (Ci) = 24.449

Total number of decays = 1.87565E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.312
Average chain length = 1.0247

Average gamma E (MeV) = 0.24520
Average beta E (MeV) = 5.33151E-02
Average alpha E (MeV) = 1.18656E-06

Composite Exposure Rate Conversion Factor = 4.32819176 R/hr per Ci/m2
Composite ECF per FGR table = 4.44963646 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.06504893 Rem/hr per Ci/m2

Ground Source

Point in time = 36.1390800 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	2.1772E+18	13.48	0.0002	0.0019	0.0000
Fe-55	2.7351	y	0.80	5.5842E+18	1.212	0.0016	0.0038	0.0000
Pa-233	27.000	d	0.37	1.4252E+17	1.144	0.2175	0.0664	0.0000
Sc-46	83.780	d	0.02	2.8758E+17	0.7443	2.0090	0.1118	0.0000
Co-60	5.2701	y	0.02	5.7762E+18	0.6507	2.5030	0.0964	0.0000
Fe-59	44.490	d	0.02	9.9544E+16	0.4851	1.1880	0.1176	0.0000
Mn-54	312.20	d	0.01	6.1197E+17	0.4250	0.8359	0.0034	0.0000
Ca-45	163.00	d	0.61	3.1841E+17	0.4236	0.0000	0.0769	0.0000
Ar-39	269.01	y	3.35	1.8605E+20	0.4106	0.0002	0.2188	0.0000
Hf-181	42.380	d	0.14	7.2927E+16	0.3731	0.5180	0.1204	0.0000
Rb-86	18.630	d	0.11	3.0496E+16	0.3549	0.0957	0.6670	0.0000
Cr-51	27.710	d	0.01	4.3249E+16	0.3384	0.0328	0.0031	0.0000
Ta-182	114.70	d	0.35	1.7812E+17	0.3367	1.2910	0.2070	0.0000
P-32	14.270	d	0.28	2.0308E+16	0.3086	0.0012	0.6949	0.0000
Cs-134	2.0650	y	0.03	1.0258E+18	0.2949	1.5500	0.1640	0.0000
S-35	87.310	d	0.18	1.1732E+17	0.2913	0.0000	0.0486	0.0000
Eu-152	13.520	y	0.10	2.0506E+18	9.0036E-02	1.1600	0.1270	0.0001
Zn-65	244.10	d	0.04	7.5257E+16	6.6848E-02	0.5900	0.0044	0.0020
Hf-175	70.000	d	1.43	1.8290E+16	5.6655E-02	0.3518	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8373E+17	2.6506E-02	1.2500	0.2790	0.0000
Cs-131	9.6900	d	0.21	1.1591E+15	2.5936E-02	0.0230	0.0057	0.0000
Tb-160	72.300	d	0.28	8.4155E+15	2.5238E-02	1.1300	0.2540	0.0000
Ba-131	11.550	d	0.43	6.5348E+14	1.2268E-02	0.4580	0.0446	0.0000
Sb-124	60.200	d	0.05	1.5064E+15	5.4257E-03	1.8500	0.3900	0.0000
Co-58	70.860	d	0.10	1.7503E+15	5.3558E-03	0.9770	0.0036	0.0300
Ag-110m	249.80	d	0.01	4.6622E+15	4.0468E-03	2.7400	0.0755	0.0000
Zr-95	64.030	d	0.01	6.6338E+14	2.2464E-03	0.7328	0.1200	0.0000
Sr-89	50.570	d	0.06	4.4831E+14	1.9222E-03	0.0010	0.5830	0.0000
Sr-85	64.850	d	0.01	5.2911E+14	1.7691E-03	0.5180	0.0081	0.0000
Se-75	119.70	d	0.20	8.0112E+14	1.4511E-03	0.3889	0.0000	0.0000
Nb-95	34.990	d	0.02	2.2736E+14	1.4089E-03	0.7645	0.0434	0.0000
Sc-47	3.3510	d	0.06	2.1656E+13	1.4012E-03	0.1089	0.1619	0.0000
Eu-155	4.7531	y	0.29	4.7274E+15	5.9044E-04	0.0613	0.0650	0.0000
Np-239	2.3550	d	0.17	4.9357E+12	4.5443E-04	0.1740	0.1079	0.0000
C-14	5701.1	y	0.53	3.9560E+18	4.1193E-04	0.0000	0.0495	0.0000
Y-90	2.6710	d	0.12	3.2980E+12	2.6772E-04	0.0020	0.9336	0.0000
Ba-133	10.540	y	0.09	3.3526E+15	1.8883E-04	0.4040	0.0547	0.0000
Nb-92m	10.150	d	0.20	7.1477E+12	1.5269E-04	0.9690	0.0056	0.0000
Y-91	58.510	d	0.10	4.0111E+13	1.4864E-04	0.0046	0.6032	0.0000
Sm-151	89.992	y	6.66	2.2083E+16	1.4568E-04	0.0000	0.1250	0.0000
Xe-133	5.2440	d	0.08	3.2892E+12	1.3600E-04	0.0463	0.1360	0.0000
Ca-47	4.5380	d	0.04	2.3695E+12	1.1321E-04	1.0600	0.4004	0.0000
Kr-85	10.750	y	0.21	1.8915E+15	1.0445E-04	0.0022	0.2507	0.0000
Rb-84	33.500	d	1.79	1.2994E+13	8.4100E-05	0.8890	0.0171	0.1440
Sm-145	340.00	d	0.88	1.0850E+14	6.9195E-05	0.0652	0.0293	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5585E+15	5.6404E-05	0.0000	0.0174	0.0000
Ag-110	24.560	s	0.45	7.2153E+07	5.5036E-05	0.0340	1.1780	0.0000
Cs-136	13.030	d	0.54	3.2642E+12	5.4318E-05	2.1700	0.1350	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 460
Total activity (Ci) = 21.602

Total number of decays = 1.88094E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.389
Average chain length = 1.0247

Average gamma E (MeV) = 0.26401
Average beta E (MeV) = 5.06559E-02
Average alpha E (MeV) = 1.36718E-06

Composite Exposure Rate Conversion Factor = 4.65904236 R/hr per Ci/m2
Composite ECF per FGR table = 4.79131031 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.30015612 Rem/hr per Ci/m2

Ground Source

Point in time = 45.1341934 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	1.8222E+18	11.28	0.0002	0.0019	0.0000
Fe-55	2.7351	y	0.80	5.5495E+18	1.205	0.0016	0.0038	0.0000
Pa-233	27.000	d	0.37	1.1313E+17	0.9085	0.2175	0.0664	0.0000
Sc-46	83.780	d	0.02	2.6695E+17	0.6909	2.0090	0.1118	0.0000
Co-60	5.2701	y	0.02	5.7575E+18	0.6485	2.5030	0.0964	0.0000
Fe-59	44.490	d	0.02	8.6527E+16	0.4217	1.1880	0.1176	0.0000
Mn-54	312.20	d	0.01	5.9987E+17	0.4166	0.8359	0.0034	0.0000
Ar-39	269.01	y	3.35	1.8604E+20	0.4106	0.0002	0.2188	0.0000
Ca-45	163.00	d	0.61	3.0646E+17	0.4077	0.0000	0.0769	0.0000
Hf-181	42.380	d	0.14	6.2950E+16	0.3221	0.5180	0.1204	0.0000
Ta-182	114.70	d	0.35	1.6870E+17	0.3189	1.2910	0.2070	0.0000
Cs-134	2.0650	y	0.03	1.0174E+18	0.2925	1.5500	0.1640	0.0000
S-35	87.310	d	0.18	1.0923E+17	0.2713	0.0000	0.0486	0.0000
Cr-51	27.710	d	0.01	3.4534E+16	0.2702	0.0328	0.0031	0.0000
Rb-86	18.630	d	0.11	2.1822E+16	0.2540	0.0957	0.6670	0.0000
P-32	14.270	d	0.28	1.3120E+16	0.1993	0.0012	0.6949	0.0000
Eu-152	13.520	y	0.10	2.0480E+18	8.9923E-02	1.1600	0.1270	0.0001
Zn-65	244.10	d	0.04	7.3359E+16	6.5162E-02	0.5900	0.0044	0.0020
Hf-175	70.000	d	1.43	1.6732E+16	5.1827E-02	0.3518	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8297E+17	2.6454E-02	1.2500	0.2790	0.0000
Tb-160	72.300	d	0.28	7.7201E+15	2.3152E-02	1.1300	0.2540	0.0000
Cs-131	9.6900	d	0.21	8.0439E+14	1.7999E-02	0.0230	0.0057	0.0000
Ba-131	11.550	d	0.43	3.8088E+14	7.1502E-03	0.4580	0.0446	0.0000
Co-58	70.860	d	0.10	1.6029E+15	4.9047E-03	0.9770	0.0036	0.0300
Sb-124	60.200	d	0.05	1.3582E+15	4.8918E-03	1.8500	0.3900	0.0000
Ag-110m	249.80	d	0.01	4.5473E+15	3.9470E-03	2.7400	0.0755	0.0000
Zr-95	64.030	d	0.01	6.0183E+14	2.0380E-03	0.7328	0.1200	0.0000
Sr-89	50.570	d	0.06	3.9630E+14	1.6992E-03	0.0010	0.5830	0.0000
Sr-85	64.850	d	0.01	4.8060E+14	1.6069E-03	0.5180	0.0081	0.0000
Nb-95	34.990	d	0.02	2.4655E+14	1.5278E-03	0.7645	0.0434	0.0000
Se-75	119.70	d	0.20	7.6046E+14	1.3775E-03	0.3889	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.7105E+15	5.8832E-04	0.0613	0.0650	0.0000
C-14	5701.1	y	0.53	3.9559E+18	4.1193E-04	0.0000	0.0495	0.0000
Sc-47	3.3510	d	0.06	4.0216E+12	2.6022E-04	0.1089	0.1619	0.0000
Ba-133	10.540	y	0.09	3.3472E+15	1.8852E-04	0.4040	0.0547	0.0000
Sm-151	89.992	y	6.66	2.2079E+16	1.4565E-04	0.0000	0.1250	0.0000
Y-91	58.510	d	0.10	3.6056E+13	1.3362E-04	0.0046	0.6032	0.0000
Kr-85	10.750	y	0.21	1.8885E+15	1.0428E-04	0.0022	0.2507	0.0000
Nb-92m	10.150	d	0.20	3.8671E+12	8.2610E-05	0.9690	0.0056	0.0000
Rb-84	33.500	d	1.79	1.0787E+13	6.9818E-05	0.8890	0.0171	0.1440
Sm-145	340.00	d	0.88	1.0653E+14	6.7938E-05	0.0652	0.0293	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5569E+15	5.6395E-05	0.0000	0.0174	0.0000
Ag-110	24.560	s	0.45	7.0375E+07	5.3680E-05	0.0340	1.1780	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Xe-133	5.2440	d	0.08	1.0023E+12	4.1443E-05	0.0463	0.1360	0.0000
Cs-136	13.030	d	0.54	2.0229E+12	3.3662E-05	2.1700	0.1350	0.0000
Np-239	2.3550	d	0.17	3.4957E+11	3.2185E-05	0.1740	0.1079	0.0000
Ca-47	4.5380	d	0.04	5.9974E+11	2.8655E-05	1.0600	0.4004	0.0000
Y-90	2.6710	d	0.12	3.1950E+11	2.5936E-05	0.0020	0.9336	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 456
Total activity (Ci) = 18.622

Total number of decays = 1.88671E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.473
Average chain length = 1.0247

Average gamma E (MeV) = 0.28896
Average beta E (MeV) = 4.84892E-02
Average alpha E (MeV) = 1.61426E-06

Composite Exposure Rate Conversion Factor = 5.09686565 R/hr per Ci/m2
Composite ECF per FGR table = 5.24426699 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.61196947 Rem/hr per Ci/m2

Ground Source

Point in time = 56.3682137 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	1.4590E+18	9.031	0.0002	0.0019	0.0000
Fe-55	2.7351	y	0.80	5.5064E+18	1.195	0.0016	0.0038	0.0000
Pa-233	27.000	d	0.37	8.4787E+16	0.6809	0.2175	0.0664	0.0000
Co-60	5.2701	y	0.02	5.7342E+18	0.6459	2.5030	0.0964	0.0000
Sc-46	83.780	d	0.02	2.4326E+17	0.6296	2.0090	0.1118	0.0000
Ar-39	269.01	y	3.35	1.8603E+20	0.4105	0.0002	0.2188	0.0000
Mn-54	312.20	d	0.01	5.8510E+17	0.4064	0.8359	0.0034	0.0000
Ca-45	163.00	d	0.61	2.9216E+17	0.3886	0.0000	0.0769	0.0000
Fe-59	44.490	d	0.02	7.2634E+16	0.3540	1.1880	0.1176	0.0000
Ta-182	114.70	d	0.35	1.5763E+17	0.2980	1.2910	0.2070	0.0000
Cs-134	2.0650	y	0.03	1.0069E+18	0.2895	1.5500	0.1640	0.0000
Hf-181	42.380	d	0.14	5.2384E+16	0.2680	0.5180	0.1204	0.0000
S-35	87.310	d	0.18	9.9910E+16	0.2481	0.0000	0.0486	0.0000
Cr-51	27.710	d	0.01	2.6074E+16	0.2040	0.0328	0.0031	0.0000
Rb-86	18.630	d	0.11	1.4367E+16	0.1672	0.0957	0.6670	0.0000
P-32	14.270	d	0.28	7.6021E+15	0.1155	0.0012	0.6949	0.0000
Eu-152	13.520	y	0.10	2.0448E+18	8.9781E-02	1.1600	0.1270	0.0001
Zn-65	244.10	d	0.04	7.1056E+16	6.3116E-02	0.5900	0.0044	0.0000
Hf-175	70.000	d	1.43	1.4970E+16	4.6371E-02	0.3518	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8202E+17	2.6388E-02	1.2500	0.2790	0.0000
Tb-160	72.300	d	0.28	6.9319E+15	2.0788E-02	1.1300	0.2540	0.0000
Cs-131	9.6900	d	0.21	4.8288E+14	1.0805E-02	0.0230	0.0057	0.0000
Co-58	70.860	d	0.10	1.4361E+15	4.3943E-03	0.9770	0.0036	0.0300
Sb-124	60.200	d	0.05	1.1934E+15	4.2983E-03	1.8500	0.3900	0.0000
Ag-110m	249.80	d	0.01	4.4077E+15	3.8259E-03	2.7400	0.0755	0.0000
Ba-131	11.550	d	0.43	1.9409E+14	3.6435E-03	0.4580	0.0446	0.0000
Zr-95	64.030	d	0.01	5.3292E+14	1.8046E-03	0.7328	0.1200	0.0000
Nb-95	34.990	d	0.02	2.5901E+14	1.6050E-03	0.7645	0.0434	0.0000
Sr-89	50.570	d	0.06	3.3975E+14	1.4567E-03	0.0010	0.5830	0.0000
Sr-85	64.850	d	0.01	4.2623E+14	1.4251E-03	0.5180	0.0081	0.0000
Se-75	119.70	d	0.20	7.1256E+14	1.2907E-03	0.3889	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.6894E+15	5.8569E-04	0.0613	0.0650	0.0000
C-14	5701.1	y	0.53	3.9559E+18	4.1192E-04	0.0000	0.0495	0.0000
Ba-133	10.540	y	0.09	3.3405E+15	1.8814E-04	0.4040	0.0547	0.0000
Sm-151	89.992	y	6.66	2.2074E+16	1.4562E-04	0.0000	0.1250	0.0000
Y-91	58.510	d	0.10	3.1563E+13	1.1697E-04	0.0046	0.6032	0.0000
Kr-85	10.750	y	0.21	1.8847E+15	1.0408E-04	0.0022	0.2507	0.0000
Sm-145	340.00	d	0.88	1.0412E+14	6.6400E-05	0.0652	0.0293	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5548E+15	5.6383E-05	0.0000	0.0174	0.0000
Rb-84	33.500	d	1.79	8.5497E+12	5.5337E-05	0.8890	0.0171	0.1440
Ag-110	24.560	s	0.45	6.8215E+07	5.2032E-05	0.0340	1.1780	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Nb-92m	10.150	d	0.20	1.7956E+12	3.8358E-05	0.9690	0.0056	0.0000
Sc-47	3.3510	d	0.06	5.3239E+11	3.4448E-05	0.1089	0.1619	0.0000
Nb-95m	3.6090	d	0.92	3.4389E+11	2.0661E-05	0.0712	0.1710	0.0000
H-3	12.330	y	0.16	3.9446E+14	1.8992E-05	0.0000	0.0057	0.0000
Cs-136	13.030	d	0.54	1.1128E+12	1.8518E-05	2.1700	0.1350	0.0000
Hg-203	46.600	d	0.05	3.7699E+12	1.7541E-05	0.2376	0.0579	0.0000
Xe-133	5.2440	d	0.08	2.2708E+11	9.3892E-06	0.0463	0.1360	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 453
Total activity (Ci) = 15.615

Total number of decays = 1.89284E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.562
Average chain length = 1.0247

Average gamma E (MeV) = 0.32224
Average beta E (MeV) = 4.71810E-02
Average alpha E (MeV) = 1.95768E-06

Composite Exposure Rate Conversion Factor = 5.67990828 R/hr per Ci/m2
Composite ECF per FGR table = 5.84830570 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.02800608 Rem/hr per Ci/m2

Ground Source

Point in time = 70.3984070 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	1.1053E+18	6.842	0.0002	0.0019	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.4530E+18	1.184	0.0016	0.0038	0.0000	0.0000
Co-60	5.2701	y	0.02	5.7053E+18	0.6427	2.5030	0.0964	0.0000	0.0000
Sc-46	83.780	d	0.02	2.1660E+17	0.5606	2.0090	0.1118	0.0000	0.0000
Pa-233	27.000	d	0.37	5.9143E+16	0.4750	0.2175	0.0664	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8601E+20	0.4105	0.0002	0.2188	0.0000	0.0000
Mn-54	312.20	d	0.01	5.6715E+17	0.3939	0.8359	0.0034	0.0000	0.0000
Ca-45	163.00	d	0.61	2.7524E+17	0.3661	0.0000	0.0769	0.0000	0.0000
Cs-134	2.0650	y	0.03	9.9405E+17	0.2858	1.5500	0.1640	0.0000	0.0000
Fe-59	44.490	d	0.02	5.8373E+16	0.2845	1.1880	0.1176	0.0000	0.0000
Ta-182	114.70	d	0.35	1.4481E+17	0.2738	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	8.9379E+16	0.2220	0.0000	0.0486	0.0000	0.0000
Hf-181	42.380	d	0.14	4.1643E+16	0.2131	0.5180	0.1204	0.0000	0.0000
Cr-51	27.710	d	0.01	1.8357E+16	0.1436	0.0328	0.0031	0.0000	0.0000
Rb-86	18.630	d	0.11	8.5246E+15	9.9213E-02	0.0957	0.6670	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0407E+18	8.9604E-02	1.1600	0.1270	0.0001	0.0000
Zn-65	244.10	d	0.04	6.8281E+16	6.0651E-02	0.5900	0.0044	0.0020	0.0000
P-32	14.270	d	0.28	3.8456E+15	5.8432E-02	0.0012	0.6949	0.0000	0.0000
Hf-175	70.000	d	1.43	1.3028E+16	4.0356E-02	0.3518	0.0000	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.8084E+17	2.6306E-02	1.2500	0.2790	0.0000	0.0000
Tb-160	72.300	d	0.28	6.0595E+15	1.8172E-02	1.1300	0.2540	0.0000	0.0000
Cs-131	9.6900	d	0.21	2.4201E+14	5.4153E-03	0.0230	0.0057	0.0000	0.0000
Co-58	70.860	d	0.10	1.2519E+15	3.8307E-03	0.9770	0.0036	0.0300	0.0000
Ag-110m	249.80	d	0.01	4.2394E+15	3.6798E-03	2.7400	0.0755	0.0000	0.0000
Sb-124	60.200	d	0.05	1.0154E+15	3.6571E-03	1.8500	0.3900	0.0000	0.0000
Nb-95	34.990	d	0.02	2.6149E+14	1.6204E-03	0.7645	0.0434	0.0000	0.0000
Ba-131	11.550	d	0.43	8.3622E+13	1.5698E-03	0.4580	0.0446	0.0000	0.0000
Zr-95	64.030	d	0.01	4.5782E+14	1.5503E-03	0.7328	0.1200	0.0000	0.0000
Sr-85	64.850	d	0.01	3.6687E+14	1.2266E-03	0.5180	0.0081	0.0000	0.0000
Sr-89	50.570	d	0.06	2.8031E+14	1.2019E-03	0.0010	0.5830	0.0000	0.0000
Se-75	119.70	d	0.20	6.5696E+14	1.1900E-03	0.3889	0.0000	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.6632E+15	5.8242E-04	0.0613	0.0650	0.0000	0.0000
C-14	5701.1	y	0.53	3.9559E+18	4.1192E-04	0.0000	0.0495	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3320E+15	1.8767E-04	0.4040	0.0547	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2067E+16	1.4557E-04	0.0000	0.1250	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8801E+15	1.0382E-04	0.0022	0.2507	0.0000	0.0000
Y-91	58.510	d	0.10	2.6730E+13	9.9055E-05	0.0046	0.6032	0.0000	0.0000
Sm-145	340.00	d	0.88	1.0118E+14	6.4527E-05	0.0652	0.0293	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3456E-05	0.0004	0.0023	0.0000	0.0000
Ni-63	100.60	y	1.39	9.5523E+15	5.6368E-05	0.0000	0.0174	0.0000	0.0000
Ag-110	24.560	s	0.45	6.5610E+07	5.0046E-05	0.0340	1.1780	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000	0.0000
Rb-84	33.500	d	1.79	6.3956E+12	4.1395E-05	0.8890	0.0171	0.1440	0.0000
H-3	12.330	y	0.16	3.9361E+14	1.8951E-05	0.0000	0.0057	0.0000	0.0000
Nb-95m	3.6090	d	0.92	2.9535E+11	1.7744E-05	0.0712	0.1710	0.0000	0.0000
Nb-92m	10.150	d	0.20	6.8881E+11	1.4714E-05	0.9690	0.0056	0.0000	0.0000
Hg-203	46.600	d	0.05	3.0599E+12	1.4237E-05	0.2376	0.0579	0.0000	0.0000
Cs-136	13.030	d	0.54	5.2759E+11	8.7793E-06	2.1700	0.1350	0.0000	0.0000
Lu-177m	160.30	d	0.25	5.6940E+12	7.7018E-06	0.9980	0.0252	0.0000	0.0000
Hf-177m	1.0800	s	5.56	3.4366E+05	5.9612E-06	1.0640	0.2404	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 451
Total activity (Ci) = 12.716

Total number of decays = 1.89916E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.654
Average chain length = 1.0247

Average gamma E (MeV) = 0.36665
Average beta E (MeV) = 4.72431E-02
Average alpha E (MeV) = 2.44017E-06

Composite Exposure Rate Conversion Factor = 6.45618296 R/hr per Ci/m2
Composite ECF per FGR table = 6.65364504 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.58307123 Rem/hr per Ci/m2

Ground Source

Point in time = 87.9205856 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	7.8147E+17	4.837	0.0002	0.0019	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.3871E+18	1.169	0.0016	0.0038	0.0000	0.0000
Co-60	5.2701	y	0.02	5.6695E+18	0.6386	2.5030	0.0964	0.0000	0.0000
Sc-46	83.780	d	0.02	1.8737E+17	0.4849	2.0090	0.1118	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8598E+20	0.4104	0.0002	0.2188	0.0000	0.0000
Mn-54	312.20	d	0.01	5.4551E+17	0.3789	0.8359	0.0034	0.0000	0.0000
Ca-45	163.00	d	0.61	2.5548E+17	0.3398	0.0000	0.0769	0.0000	0.0000
Pa-233	27.000	d	0.37	3.7718E+16	0.3029	0.2175	0.0664	0.0000	0.0000
Cs-134	2.0650	y	0.03	9.7817E+17	0.2812	1.5500	0.1640	0.0000	0.0000
Ta-182	114.70	d	0.35	1.3026E+17	0.2462	1.2910	0.2070	0.0000	0.0000
Fe-59	44.490	d	0.02	4.4427E+16	0.2165	1.1880	0.1176	0.0000	0.0000
S-35	87.310	d	0.18	7.7772E+16	0.1931	0.0000	0.0486	0.0000	0.0000
Hf-181	42.380	d	0.14	3.1266E+16	0.1600	0.5180	0.1204	0.0000	0.0000
Cr-51	27.710	d	0.01	1.1842E+16	9.2664E-02	0.0328	0.0031	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0357E+18	8.9384E-02	1.1600	0.1270	0.0001	0.0000
Zn-65	244.10	d	0.04	6.4966E+16	5.7707E-02	0.5900	0.0044	0.0020	0.0000
Rb-86	18.630	d	0.11	4.4416E+15	5.1694E-02	0.0957	0.6670	0.0000	0.0000
Hf-175	70.000	d	1.43	1.0953E+16	3.3928E-02	0.3518	0.0000	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.7936E+17	2.6205E-02	1.2500	0.2790	0.0000	0.0000
P-32	14.270	d	0.28	1.6418E+15	2.4947E-02	0.0012	0.6949	0.0000	0.0000
Tb-160	72.300	d	0.28	5.1225E+15	1.5362E-02	1.1300	0.2540	0.0000	0.0000
Ag-110m	249.80	d	0.01	4.0382E+15	3.5052E-03	2.7400	0.0755	0.0000	0.0000
Co-58	70.860	d	0.10	1.0547E+15	3.2273E-03	0.9770	0.0036	0.0300	0.0000
Sb-124	60.200	d	0.05	8.2986E+14	2.9890E-03	1.8500	0.3900	0.0000	0.0000
Cs-131	9.6900	d	0.21	9.6924E+13	2.1688E-03	0.0230	0.0057	0.0000	0.0000
Nb-95	34.990	d	0.02	2.5127E+14	1.5571E-03	0.7645	0.0434	0.0000	0.0000
Zr-95	64.030	d	0.01	3.7872E+14	1.2825E-03	0.7328	0.1200	0.0000	0.0000
Se-75	119.70	d	0.20	5.9357E+14	1.0752E-03	0.3889	0.0000	0.0000	0.0000
Sr-85	64.850	d	0.01	3.0421E+14	1.0171E-03	0.5180	0.0081	0.0000	0.0000
Sr-89	50.570	d	0.06	2.2046E+14	9.4526E-04	0.0010	0.5830	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.6307E+15	5.7836E-04	0.0613	0.0650	0.0000	0.0000
Ba-131	11.550	d	0.43	2.9217E+13	5.4849E-04	0.4580	0.0446	0.0000	0.0000
C-14	5701.1	y	0.53	3.9559E+18	4.1192E-04	0.0000	0.0495	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3215E+15	1.8708E-04	0.4040	0.0547	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2059E+16	1.4552E-04	0.0000	0.1250	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8743E+15	1.0350E-04	0.0022	0.2507	0.0000	0.0000
Y-91	58.510	d	0.10	2.1719E+13	8.0487E-05	0.0046	0.6032	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000	0.0000
Sm-145	340.00	d	0.88	9.7634E+13	6.2263E-05	0.0652	0.0293	0.0000	0.0000
Ni-63	100.60	y	1.39	9.5491E+15	5.6349E-05	0.0000	0.0174	0.0000	0.0000
Ag-110	24.560	s	0.45	6.2496E+07	4.7670E-05	0.0340	1.1780	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000	0.0000
Rb-84	33.500	d	1.79	4.4507E+12	2.8806E-05	0.8890	0.0171	0.1440	0.0000
H-3	12.330	y	0.16	3.9255E+14	1.8900E-05	0.0000	0.0057	0.0000	0.0000
Nb-95m	3.6090	d	0.92	2.4431E+11	1.4678E-05	0.0712	0.1710	0.0000	0.0000
Hg-203	46.600	d	0.05	2.3578E+12	1.0971E-05	0.2376	0.0579	0.0000	0.0000
Lu-177m	160.30	d	0.25	5.2785E+12	7.1398E-06	0.9980	0.0252	0.0000	0.0000
Hf-177m	1.0800	s	5.56	3.1859E+05	5.5262E-06	1.0640	0.2404	0.0000	0.0000
Pu-239	24111.	y	0.05	2.0410E+17	5.0253E-06	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.1822E+08	5.0223E-06	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155348D+20

Total number of nuclides = 448
Total activity (Ci) = 10.071

Total number of decays = 1.90550E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.746
Average chain length = 1.0247

Average gamma E (MeV) = 0.42516
Average beta E (MeV) = 4.92263E-02
Average alpha E (MeV) = 3.11923E-06

Composite Exposure Rate Conversion Factor = 7.47661924 R/hr per Ci/m2
Composite ECF per FGR table = 7.71395302 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.31452751 Rem/hr per Ci/m2

Ground Source

Point in time = 109.804245 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.0682E+17	3.137	0.0002	0.0019	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.3059E+18	1.152	0.0016	0.0038	0.0000	0.0000
Co-60	5.2701	y	0.02	5.6250E+18	0.6336	2.5030	0.0964	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8596E+20	0.4104	0.0002	0.2188	0.0000	0.0000
Sc-46	83.780	d	0.02	1.5634E+17	0.4046	2.0090	0.1118	0.0000	0.0000
Mn-54	312.20	d	0.01	5.1964E+17	0.3609	0.8359	0.0034	0.0000	0.0000
Ca-45	163.00	d	0.61	2.3278E+17	0.3096	0.0000	0.0769	0.0000	0.0000
Cs-134	2.0650	y	0.03	9.5869E+17	0.2756	1.5500	0.1640	0.0000	0.0000
Ta-182	114.70	d	0.35	1.1413E+17	0.2157	1.2910	0.2070	0.0000	0.0000
Pa-233	27.000	d	0.37	2.1506E+16	0.1727	0.2175	0.0664	0.0000	0.0000
S-35	87.310	d	0.18	6.5369E+16	0.1623	0.0000	0.0486	0.0000	0.0000
Fe-59	44.490	d	0.02	3.1592E+16	0.1540	1.1880	0.1176	0.0000	0.0000
Hf-181	42.380	d	0.14	2.1859E+16	0.1118	0.5180	0.1204	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0295E+18	8.9110E-02	1.1600	0.1270	0.0001	0.0000
Zn-65	244.10	d	0.04	6.1052E+16	5.4230E-02	0.5900	0.0044	0.0020	0.0000
Cr-51	27.710	d	0.01	6.8502E+15	5.3601E-02	0.0328	0.0031	0.0000	0.0000
Hf-175	70.000	d	1.43	8.8193E+15	2.7318E-02	0.3518	0.0000	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.7754E+17	2.6079E-02	1.2500	0.2790	0.0000	0.0000
Rb-86	18.630	d	0.11	1.9676E+15	2.2900E-02	0.0957	0.6670	0.0000	0.0000
Tb-160	72.300	d	0.28	4.1530E+15	1.2455E-02	1.1300	0.2540	0.0000	0.0000
P-32	14.270	d	0.28	5.6713E+14	8.6173E-03	0.0012	0.6949	0.0000	0.0000
Ag-110m	249.80	d	0.01	3.8003E+15	3.2987E-03	2.7400	0.0755	0.0000	0.0000
Co-58	70.860	d	0.10	8.5147E+14	2.6054E-03	0.9770	0.0036	0.0300	0.0000
Sb-124	60.200	d	0.05	6.4502E+14	2.3232E-03	1.8500	0.3900	0.0000	0.0000
Nb-95	34.990	d	0.02	2.2715E+14	1.4076E-03	0.7645	0.0434	0.0000	0.0000
Zr-95	64.030	d	0.01	2.9884E+14	1.0120E-03	0.7328	0.1200	0.0000	0.0000
Se-75	119.70	d	0.20	5.2292E+14	9.4723E-04	0.3889	0.0000	0.0000	0.0000
Sr-85	64.850	d	0.01	2.4076E+14	8.0499E-04	0.5180	0.0081	0.0000	0.0000
Sr-89	50.570	d	0.06	1.6333E+14	7.0030E-04	0.0010	0.5830	0.0000	0.0000
Cs-131	9.6900	d	0.21	2.9379E+13	6.5739E-04	0.0230	0.0057	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.5904E+15	5.7333E-04	0.0613	0.0650	0.0000	0.0000
C-14	5701.1	y	0.53	3.9559E+18	4.1192E-04	0.0000	0.0495	0.0000	0.0000
Ba-133	10.540	y	0.09	3.3085E+15	1.8634E-04	0.4040	0.0547	0.0000	0.0000
Ba-131	11.550	d	0.43	7.8574E+12	1.4751E-04	0.4580	0.0446	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2049E+16	1.4545E-04	0.0000	0.1250	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8670E+15	1.0310E-04	0.0022	0.2507	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000	0.0000
Y-91	58.510	d	0.10	1.6759E+13	6.2106E-05	0.0046	0.6032	0.0000	0.0000
Sm-145	340.00	d	0.88	9.3374E+13	5.9546E-05	0.0652	0.0293	0.0000	0.0000
Ni-63	100.60	y	1.39	9.5452E+15	5.6326E-05	0.0000	0.0174	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000	0.0000
Ag-110	24.560	s	0.45	5.8814E+07	4.4862E-05	0.0340	1.1780	0.0000	0.0000
H-3	12.330	y	0.16	3.9123E+14	1.8836E-05	0.0000	0.0057	0.0000	0.0000
Rb-84	33.500	d	1.79	2.8299E+12	1.8317E-05	0.8890	0.0171	0.1440	0.0000
Nb-95m	3.6090	d	0.92	1.9278E+11	1.1582E-05	0.0712	0.1710	0.0000	0.0000
Hg-203	46.600	d	0.05	1.7027E+12	7.9226E-06	0.2376	0.0579	0.0000	0.0000
Lu-177m	160.30	d	0.25	4.8019E+12	6.4952E-06	0.9980	0.0252	0.0000	0.0000
Hf-177m	1.0800	s	5.56	2.8982E+05	5.0273E-06	1.0640	0.2404	0.0000	0.0000
Pu-239	24111.	y	0.05	2.0410E+17	5.0253E-06	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.1822E+08	5.0223E-06	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 446
Total activity (Ci) = 7.8101

Total number of decays = 1.91170E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.837
Average chain length = 1.0247

Average gamma E (MeV) = 0.49956
Average beta E (MeV) = 5.35198E-02
Average alpha E (MeV) = 4.05948E-06

Composite Exposure Rate Conversion Factor = 8.76984215 R/hr per Ci/m2
Composite ECF per FGR table = 9.06039429 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.24445915 Rem/hr per Ci/m2

Ground Source

Point in time = 137.134811 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	2.9511E+17	1.827	0.0002	0.0019	0.0000	0.0000
Fe-55	2.7351	y	0.80	5.2063E+18	1.130	0.0016	0.0038	0.0000	0.0000
Co-60	5.2701	y	0.02	5.5699E+18	0.6274	2.5030	0.0964	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8592E+20	0.4103	0.0002	0.2188	0.0000	0.0000
Mn-54	312.20	d	0.01	4.8905E+17	0.3396	0.8359	0.0034	0.0000	0.0000
Sc-46	83.780	d	0.02	1.2470E+17	0.3227	2.0090	0.1118	0.0000	0.0000
Ca-45	163.00	d	0.61	2.0723E+17	0.2757	0.0000	0.0769	0.0000	0.0000
Cs-134	2.0650	y	0.03	9.3491E+17	0.2688	1.5500	0.1640	0.0000	0.0000
Ta-182	114.70	d	0.35	9.6752E+16	0.1829	1.2910	0.2070	0.0000	0.0000
S-35	87.310	d	0.18	5.2619E+16	0.1307	0.0000	0.0486	0.0000	0.0000
Fe-59	44.490	d	0.02	2.0637E+16	0.1006	1.1880	0.1176	0.0000	0.0000
Eu-152	13.520	y	0.10	2.0217E+18	8.8769E-02	1.1600	0.1270	0.0001	0.0000
Pa-233	27.000	d	0.37	1.0662E+16	8.5622E-02	0.2175	0.0664	0.0000	0.0000
Hf-181	42.380	d	0.14	1.3980E+16	7.1524E-02	0.5180	0.1204	0.0000	0.0000
Zn-65	244.10	d	0.04	5.6493E+16	5.0181E-02	0.5900	0.0044	0.0020	0.0000
Cr-51	27.710	d	0.01	3.4578E+15	2.7056E-02	0.0328	0.0031	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.7526E+17	2.5922E-02	1.2500	0.2790	0.0000	0.0000
Hf-175	70.000	d	1.43	6.7282E+15	2.0841E-02	0.3518	0.0000	0.0000	0.0000
Tb-160	72.300	d	0.28	3.1957E+15	9.5839E-03	1.1300	0.2540	0.0000	0.0000
Rb-86	18.630	d	0.11	7.1174E+14	8.2836E-03	0.0957	0.6670	0.0000	0.0000
Ag-110m	249.80	d	0.01	3.5228E+15	3.0578E-03	2.7400	0.0755	0.0000	0.0000
P-32	14.270	d	0.28	1.5036E+14	2.2847E-03	0.0012	0.6949	0.0000	0.0000
Co-58	70.860	d	0.10	6.5172E+14	1.9942E-03	0.9770	0.0036	0.0300	0.0000
Sb-124	60.200	d	0.05	4.7088E+14	1.6960E-03	1.8500	0.3900	0.0000	0.0000
Nb-95	34.990	d	0.02	1.9050E+14	1.1805E-03	0.7645	0.0434	0.0000	0.0000
Se-75	119.70	d	0.20	4.4638E+14	8.0858E-04	0.3889	0.0000	0.0000	0.0000
Zr-95	64.030	d	0.01	2.2230E+14	7.5279E-04	0.7328	0.1200	0.0000	0.0000
Sr-85	64.850	d	0.01	1.7977E+14	6.0107E-04	0.5180	0.0081	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.5406E+15	5.6710E-04	0.0613	0.0650	0.0000	0.0000
Sr-89	50.570	d	0.06	1.1230E+14	4.8149E-04	0.0010	0.5830	0.0000	0.0000
C-14	5701.1	y	0.53	3.9558E+18	4.1191E-04	0.0000	0.0495	0.0000	0.0000
Ba-133	10.540	y	0.09	3.2922E+15	1.8543E-04	0.4040	0.0547	0.0000	0.0000
Sm-151	89.992	y	6.66	2.2036E+16	1.4537E-04	0.0000	0.1250	0.0000	0.0000
Cs-131	9.6900	d	0.21	6.3032E+12	1.4104E-04	0.0230	0.0057	0.0000	0.0000
Kr-85	10.750	y	0.21	1.8580E+15	1.0260E-04	0.0022	0.2507	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000	0.0000
Sm-145	340.00	d	0.88	8.8313E+13	5.6319E-05	0.0652	0.0293	0.0000	0.0000
Ni-63	100.60	y	1.39	9.5403E+15	5.6297E-05	0.0000	0.0174	0.0000	0.0000
Y-91	58.510	d	0.10	1.2124E+13	4.4929E-05	0.0046	0.6032	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000	0.0000
Ag-110	24.560	s	0.45	5.4519E+07	4.1586E-05	0.0340	1.1780	0.0000	0.0000
Ba-131	11.550	d	0.43	1.5239E+12	2.8608E-05	0.4580	0.0446	0.0000	0.0000
H-3	12.330	y	0.16	3.8959E+14	1.8757E-05	0.0000	0.0057	0.0000	0.0000
Rb-84	33.500	d	1.79	1.6076E+12	1.0405E-05	0.8890	0.0171	0.1440	0.0000
Nb-95m	3.6090	d	0.92	1.4341E+11	8.6157E-06	0.0712	0.1710	0.0000	0.0000
Lu-177m	160.30	d	0.25	4.2667E+12	5.7712E-06	0.9980	0.0252	0.0000	0.0000
Hg-203	46.600	d	0.05	1.1339E+12	5.2762E-06	0.2376	0.0579	0.0000	0.0000
Pu-239	24111.	y	0.05	2.0410E+17	5.0253E-06	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.1822E+08	5.0223E-06	0.0000	0.0000	0.0000	0.0000
Hf-177m	1.0800	s	5.56	2.5752E+05	4.4669E-06	1.0640	0.2404	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 440
Total activity (Ci) = 6.0180

Total number of decays = 1.91768E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 27.924
Average chain length = 1.0247

Average gamma E (MeV) = 0.58714
Average beta E (MeV) = 5.99868E-02
Average alpha E (MeV) = 5.30075E-06

Composite Exposure Rate Conversion Factor = 10.2858210 R/hr per Ci/m2
Composite ECF per FGR table = 10.6431093 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.33930874 Rem/hr per Ci/m2

Ground Source

Point in time = 171.267685 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	5.0844E+18	1.104	0.0016	0.0038	0.0000
Ar-37	35.030	d	0.09	1.5020E+17	0.9297	0.0002	0.0019	0.0000
Co-60	5.2701	y	0.02	5.5018E+18	0.6197	2.5030	0.0964	0.0000
Ar-39	269.01	y	3.35	1.8588E+20	0.4102	0.0002	0.2188	0.0000
Mn-54	312.20	d	0.01	4.5336E+17	0.3149	0.8359	0.0034	0.0000
Cs-134	2.0650	y	0.03	9.0604E+17	0.2605	1.5500	0.1640	0.0000
Sc-46	83.780	d	0.02	9.4021E+16	0.2433	2.0090	0.1118	0.0000
Ca-45	163.00	d	0.61	1.7924E+17	0.2384	0.0000	0.0769	0.0000
Ta-182	114.70	d	0.35	7.8719E+16	0.1488	1.2910	0.2070	0.0000
S-35	87.310	d	0.18	4.0129E+16	9.9656E-02	0.0000	0.0486	0.0000
Eu-152	13.520	y	0.10	2.0120E+18	8.8345E-02	1.1600	0.1270	0.0001
Fe-59	44.490	d	0.02	1.2126E+16	5.9095E-02	1.1880	0.1176	0.0000
Zn-65	244.10	d	0.04	5.1275E+16	4.5545E-02	0.5900	0.0044	0.0020
Hf-181	42.380	d	0.14	7.9993E+15	4.0926E-02	0.5180	0.1204	0.0000
Pa-233	27.000	d	0.37	4.4390E+15	3.5648E-02	0.2175	0.0664	0.0000
Eu-154	8.5942	y	0.04	3.7245E+17	2.5727E-02	1.2500	0.2790	0.0000
Hf-175	70.000	d	1.43	4.7986E+15	1.4864E-02	0.3518	0.0000	0.0000
Cr-51	27.710	d	0.01	1.4723E+15	1.1520E-02	0.0328	0.0031	0.0000
Tb-160	72.300	d	0.28	2.3038E+15	6.9091E-03	1.1300	0.2540	0.0000
Ag-110m	249.80	d	0.01	3.2044E+15	2.7814E-03	2.7400	0.0755	0.0000
Rb-86	18.630	d	0.11	1.9989E+14	2.3264E-03	0.0957	0.6670	0.0000
Co-58	70.860	d	0.10	4.6672E+14	1.4281E-03	0.9770	0.0036	0.0300
Sb-124	60.200	d	0.05	3.1785E+14	1.1448E-03	1.8500	0.3900	0.0000
Nb-95	34.990	d	0.02	1.4577E+14	9.0330E-04	0.7645	0.0434	0.0000
Se-75	119.70	d	0.20	3.6632E+14	6.6356E-04	0.3889	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.4791E+15	5.5943E-04	0.0613	0.0650	0.0000
Zr-95	64.030	d	0.01	1.5363E+14	5.2023E-04	0.7328	0.1200	0.0000
P-32	14.270	d	0.28	2.8648E+13	4.3529E-04	0.0012	0.6949	0.0000
Sr-85	64.850	d	0.01	1.2482E+14	4.1733E-04	0.5180	0.0081	0.0000
C-14	5701.1	y	0.53	3.9558E+18	4.1191E-04	0.0000	0.0495	0.0000
Sr-89	50.570	d	0.06	7.0338E+13	3.0158E-04	0.0010	0.5830	0.0000
Ba-133	10.540	y	0.09	3.2721E+15	1.8429E-04	0.4040	0.0547	0.0000
Sm-151	89.992	y	6.66	2.2021E+16	1.4526E-04	0.0000	0.1250	0.0000
Kr-85	10.750	y	0.21	1.8469E+15	1.0199E-04	0.0022	0.2507	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5341E+15	5.6261E-05	0.0000	0.0174	0.0000
Sm-145	340.00	d	0.88	8.2377E+13	5.2534E-05	0.0652	0.0293	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Ag-110	24.560	s	0.45	4.9592E+07	3.7828E-05	0.0340	1.1780	0.0000
Y-91	58.510	d	0.10	8.0915E+12	2.9985E-05	0.0046	0.6032	0.0000
Cs-131	9.6900	d	0.21	8.8131E+11	1.9720E-05	0.0230	0.0057	0.0000
H-3	12.330	y	0.16	3.8755E+14	1.8659E-05	0.0000	0.0057	0.0000
Nb-95m	3.6090	d	0.92	9.9105E+10	5.9541E-06	0.0712	0.1710	0.0000
Rb-84	33.500	d	1.79	7.9336E+11	5.1349E-06	0.8890	0.0171	0.1440
Pu-239	24111.	y	0.05	2.0410E+17	5.0253E-06	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	4.1822E+08	5.0223E-06	0.0000	0.0000	0.0000
Lu-177m	160.30	d	0.25	3.6812E+12	4.9793E-06	0.9980	0.0252	0.0000
Hf-177m	1.0800	s	5.56	2.2218E+05	3.8540E-06	1.0640	0.2404	0.0000
Ba-131	11.550	d	0.43	1.9649E+11	3.6887E-06	0.4580	0.0446	0.0000
Ag-108m	418.01	y	3.59	2.2762E+15	3.2327E-06	1.6800	0.0151	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155346D+20

Total number of nuclides = 432
Total activity (Ci) = 4.7100

Total number of decays = 1.92346E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 28.008
Average chain length = 1.0247

Average gamma E (MeV) = 0.67692
Average beta E (MeV) = 6.75641E-02
Average alpha E (MeV) = 6.79649E-06

Composite Exposure Rate Conversion Factor = 11.8294544 R/hr per Ci/m2
Composite ECF per FGR table = 12.2615385 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 8.46148872 Rem/hr per Ci/m2

Ground Source

Point in time = 213.896667 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	4.9362E+18	1.071	0.0016	0.0038	0.0000
Co-60	5.2701	y	0.02	5.4180E+18	0.6103	2.5030	0.0964	0.0000
Ar-39	269.01	y	3.35	1.8582E+20	0.4101	0.0002	0.2188	0.0000
Ar-37	35.030	d	0.09	6.4616E+16	0.4000	0.0002	0.0019	0.0000
Mn-54	312.20	d	0.01	4.1242E+17	0.2864	0.8359	0.0034	0.0000
Cs-134	2.0650	y	0.03	8.7123E+17	0.2505	1.5500	0.1640	0.0000
Ca-45	163.00	d	0.61	1.4952E+17	0.1989	0.0000	0.0769	0.0000
Sc-46	83.780	d	0.02	6.6078E+16	0.1710	2.0090	0.1118	0.0000
Ta-182	114.70	d	0.35	6.0841E+16	0.1150	1.2910	0.2070	0.0000
Eu-152	13.520	y	0.10	2.0000E+18	8.7818E-02	1.1600	0.1270	0.0001
S-35	87.310	d	0.18	2.8607E+16	7.1044E-02	0.0000	0.0486	0.0000
Zn-65	244.10	d	0.04	4.5429E+16	4.0353E-02	0.5900	0.0044	0.0020
Fe-59	44.490	d	0.02	6.2412E+15	3.0417E-02	1.1880	0.1176	0.0000
Eu-154	8.5942	y	0.04	3.6896E+17	2.5486E-02	1.2500	0.2790	0.0000
Hf-181	42.380	d	0.14	3.9834E+15	2.0380E-02	0.5180	0.1204	0.0000
Pa-233	27.000	d	0.37	1.4859E+15	1.1933E-02	0.2175	0.0664	0.0000
Hf-175	70.000	d	1.43	3.1462E+15	9.7455E-03	0.3518	0.0000	0.0000
Tb-160	72.300	d	0.28	1.5310E+15	4.5913E-03	1.1300	0.2540	0.0000
Cr-51	27.710	d	0.01	5.0686E+14	3.9661E-03	0.0328	0.0031	0.0000
Ag-110m	249.80	d	0.01	2.8470E+15	2.4711E-03	2.7400	0.0755	0.0000
Co-58	70.860	d	0.10	3.0758E+14	9.4117E-04	0.9770	0.0036	0.0300
Sb-124	60.200	d	0.05	1.9456E+14	7.0077E-04	1.8500	0.3900	0.0000
Nb-95	34.990	d	0.02	9.9776E+13	6.1829E-04	0.7645	0.0434	0.0000
Eu-155	4.7531	y	0.29	4.4035E+15	5.4999E-04	0.0613	0.0650	0.0000
Se-75	119.70	d	0.20	2.8619E+14	5.1841E-04	0.3889	0.0000	0.0000
Rb-86	18.630	d	0.11	4.0924E+13	4.7629E-04	0.0957	0.6670	0.0000
C-14	5701.1	y	0.53	3.9557E+18	4.1190E-04	0.0000	0.0495	0.0000
Zr-95	64.030	d	0.01	9.6841E+13	3.2793E-04	0.7328	0.1200	0.0000
Sr-85	64.850	d	0.01	7.9141E+13	2.6461E-04	0.5180	0.0081	0.0000
Ba-133	10.540	y	0.09	3.2470E+15	1.8288E-04	0.4040	0.0547	0.0000
Sr-89	50.570	d	0.06	3.9213E+13	1.6813E-04	0.0010	0.5830	0.0000
Sm-151	89.992	y	6.66	2.2001E+16	1.4513E-04	0.0000	0.1250	0.0000
Kr-85	10.750	y	0.21	1.8330E+15	1.0122E-04	0.0022	0.2507	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5265E+15	5.6215E-05	0.0000	0.0174	0.0000
P-32	14.270	d	0.28	3.6126E+12	5.4892E-05	0.0012	0.6949	0.0000
Sm-145	340.00	d	0.88	7.5520E+13	4.8161E-05	0.0652	0.0293	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Ag-110	24.560	s	0.45	4.4060E+07	3.3608E-05	0.0340	1.1780	0.0000
H-3	12.330	y	0.16	3.8501E+14	1.8537E-05	0.0000	0.0057	0.0000
Y-91	58.510	d	0.10	4.8832E+12	1.8096E-05	0.0046	0.6032	0.0000
Pu-239	24111.	y	0.05	2.0410E+17	5.0253E-06	0.0001	0.0000	5.1000
U-235m	26.000	m	7.69	4.1821E+08	5.0222E-06	0.0000	0.0000	0.0000
Lu-177m	160.30	d	0.25	3.0615E+12	4.1411E-06	0.9980	0.0252	0.0000
Nb-95m	3.6090	d	0.92	6.2471E+10	3.7532E-06	0.0712	0.1710	0.0000
Ag-108m	418.01	y	3.59	2.2758E+15	3.2320E-06	1.6800	0.0151	0.0000
Hf-177m	1.0800	s	5.56	1.8478E+05	3.2052E-06	1.0640	0.2404	0.0000
Rb-84	33.500	d	1.79	3.2840E+11	2.1256E-06	0.8890	0.0171	0.1440
Hg-203	46.600	d	0.05	3.6201E+11	1.6844E-06	0.2376	0.0579	0.0000
Cs-131	9.6900	d	0.21	7.2524E+10	1.6228E-06	0.0230	0.0057	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155352D+20

Total number of nuclides = 426
Total activity (Ci) = 3.8275

Total number of decays = 1.92921E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 28.092
Average chain length = 1.0247

Average gamma E (MeV) = 0.75113
Average beta E (MeV) = 7.44227E-02
Average alpha E (MeV) = 8.37746E-06

Composite Exposure Rate Conversion Factor = 13.0906267 R/hr per Ci/m2
Composite ECF per FGR table = 13.5940275 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 9.38910007 Rem/hr per Ci/m2

Ground Source

Point in time = 267.136078 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	4.7572E+18	1.033	0.0016	0.0038	0.0000
Co-60	5.2701	y	0.02	5.3151E+18	0.5987	2.5030	0.0964	0.0000
Ar-39	269.01	y	3.35	1.8575E+20	0.4099	0.0002	0.2188	0.0000
Mn-54	312.20	d	0.01	3.6644E+17	0.2545	0.8359	0.0034	0.0000
Cs-134	2.0650	y	0.03	8.2963E+17	0.2385	1.5500	0.1640	0.0000
Ca-45	163.00	d	0.61	1.1923E+17	0.1586	0.0000	0.0769	0.0000
Ar-37	35.030	d	0.09	2.2533E+16	0.1395	0.0002	0.0019	0.0000
Sc-46	83.780	d	0.02	4.2536E+16	0.1101	2.0090	0.1118	0.0000
Eu-152	13.520	y	0.10	1.9852E+18	8.7164E-02	1.1600	0.1270	0.0001
Ta-182	114.70	d	0.35	4.4103E+16	8.3372E-02	1.2910	0.2070	0.0000
S-35	87.310	d	0.18	1.8746E+16	4.6555E-02	0.0000	0.0486	0.0000
Zn-65	244.10	d	0.04	3.9055E+16	3.4691E-02	0.5900	0.0044	0.0020
Eu-154	8.5942	y	0.04	3.6464E+17	2.5188E-02	1.2500	0.2790	0.0000
Fe-59	44.490	d	0.02	2.7229E+15	1.3270E-02	1.1880	0.1176	0.0000
Hf-181	42.380	d	0.14	1.6676E+15	8.5317E-03	0.5180	0.1204	0.0000
Hf-175	70.000	d	1.43	1.8571E+15	5.7524E-03	0.3518	0.0000	0.0000
Pa-233	27.000	d	0.37	3.7881E+14	3.0421E-03	0.2175	0.0664	0.0000
Tb-160	72.300	d	0.28	9.1895E+14	2.7559E-03	1.1300	0.2540	0.0000
Ag-110m	249.80	d	0.01	2.4560E+15	2.1318E-03	2.7400	0.0755	0.0000
Cr-51	27.710	d	0.01	1.3382E+14	1.0471E-03	0.0328	0.0031	0.0000
Co-58	70.860	d	0.10	1.8272E+14	5.5911E-04	0.9770	0.0036	0.0030
Eu-155	4.7531	y	0.29	4.3109E+15	5.3842E-04	0.0613	0.0650	0.0000
C-14	5701.1	y	0.53	3.9556E+18	4.1189E-04	0.0000	0.0495	0.0000
Se-75	119.70	d	0.20	2.1027E+14	3.8088E-04	0.3889	0.0000	0.0000
Sb-124	60.200	d	0.05	1.0540E+14	3.7962E-04	1.8500	0.3900	0.0000
Nb-95	34.990	d	0.02	5.9682E+13	3.6983E-04	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	5.4420E+13	1.8428E-04	0.7328	0.1200	0.0000
Ba-133	10.540	y	0.09	3.2161E+15	1.8114E-04	0.4040	0.0547	0.0000
Sr-85	64.850	d	0.01	4.4799E+13	1.4978E-04	0.5180	0.0081	0.0000
Sm-151	89.992	y	6.66	2.1976E+16	1.4497E-04	0.0000	0.1250	0.0000
Kr-85	10.750	y	0.21	1.8159E+15	1.0028E-04	0.0022	0.2507	0.0000
Sr-89	50.570	d	0.06	1.8902E+13	8.1045E-05	0.0010	0.5830	0.0000
Rb-86	18.630	d	0.11	5.6457E+12	6.5707E-05	0.0957	0.6670	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.5169E+15	5.6159E-05	0.0000	0.0174	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Sm-145	340.00	d	0.88	6.7752E+13	4.3207E-05	0.0652	0.0293	0.0000
Ag-110	24.560	s	0.45	3.8009E+07	2.8992E-05	0.0340	1.1780	0.0000
H-3	12.330	y	0.16	3.8187E+14	1.8385E-05	0.0000	0.0057	0.0000
Y-91	58.510	d	0.10	2.5989E+12	9.6311E-06	0.0046	0.6032	0.0000
Pu-239	24111.	y	0.05	2.0410E+17	5.0252E-06	0.0001	0.0000	5.1000
U-235m	26.000	m	7.69	4.1821E+08	5.0222E-06	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	2.7210E+11	4.1343E-06	0.0012	0.6949	0.0000
Lu-177m	160.30	d	0.25	2.4320E+12	3.2895E-06	0.9980	0.0252	0.0000
Ag-108m	418.01	y	3.59	2.2752E+15	3.2312E-06	1.6800	0.0151	0.0000
Hf-177m	1.0800	s	5.56	1.4678E+05	2.5461E-06	1.0640	0.2404	0.0000
Nb-95m	3.6090	d	0.92	3.5106E+10	2.1091E-06	0.0712	0.1710	0.0000
Pm-145	17.700	y	2.26	4.8290E+13	1.6196E-06	0.0332	0.0136	0.0000
Nb-94	19990.	y	12.33	5.0412E+16	1.4971E-06	1.5720	0.1460	0.0000
U-233	0.15930E+06	y	0.13	3.5982E+17	1.3409E-06	0.0013	0.0000	4.8130

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155353D+20

Total number of nuclides = 422
Total activity (Ci) = 3.2597

Total number of decays = 1.93519E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 28.179
Average chain length = 1.0247

Average gamma E (MeV) = 0.79717
Average beta E (MeV) = 7.91659E-02
Average alpha E (MeV) = 9.84307E-06

Composite Exposure Rate Conversion Factor = 13.8529119 R/hr per Ci/m2
Composite ECF per FGR table = 14.4137955 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 9.96459866 Rem/hr per Ci/m2

Ground Source

Point in time = 333.626343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	4.5427E+18	0.9860	0.0016	0.0038	0.0000	0.0000
Co-60	5.2701	y	0.02	5.1894E+18	0.5846	2.5030	0.0964	0.0000	0.0000
Ar-39	269.01	y	3.35	1.8566E+20	0.4097	0.0002	0.2188	0.0000	0.0000
Cs-134	2.0650	y	0.03	7.8046E+17	0.2244	1.5500	0.1640	0.0000	0.0000
Mn-54	312.20	d	0.01	3.1615E+17	0.2196	0.8359	0.0034	0.0000	0.0000
Ca-45	163.00	d	0.61	8.9863E+16	0.1195	0.0000	0.0769	0.0000	0.0000
Eu-152	13.520	y	0.10	1.9667E+18	8.6354E-02	1.1600	0.1270	0.0001	0.0000
Sc-46	83.780	d	0.02	2.4539E+16	6.3507E-02	2.0090	0.1118	0.0000	0.0000
Ta-182	114.70	d	0.35	2.9510E+16	5.5785E-02	1.2910	0.2070	0.0000	0.0000
Ar-37	35.030	d	0.09	6.0456E+15	3.7421E-02	0.0002	0.0019	0.0000	0.0000
Zn-65	244.10	d	0.04	3.2335E+16	2.8722E-02	0.5900	0.0044	0.0020	0.0000
S-35	87.310	d	0.18	1.1058E+16	2.7461E-02	0.0000	0.0486	0.0000	0.0000
Eu-154	8.5942	y	0.04	3.5933E+17	2.4821E-02	1.2500	0.2790	0.0000	0.0000
Fe-59	44.490	d	0.02	9.6637E+14	4.7097E-03	1.1880	0.1176	0.0000	0.0000
Hf-175	70.000	d	1.43	9.6139E+14	2.9779E-03	0.3518	0.0000	0.0000	0.0000
Hf-181	42.380	d	0.14	5.6208E+14	2.8757E-03	0.5180	0.1204	0.0000	0.0000
Ag-110m	249.80	d	0.01	2.0422E+15	1.7726E-03	2.7400	0.0755	0.0000	0.0000
Tb-160	72.300	d	0.28	4.8579E+14	1.4569E-03	1.1300	0.2540	0.0000	0.0000
Pa-233	27.000	d	0.37	6.8724E+13	5.5189E-04	0.2175	0.0664	0.0000	0.0000
Eu-155	4.7531	y	0.29	4.1980E+15	5.2431E-04	0.0613	0.0650	0.0000	0.0000
C-14	5701.1	y	0.53	3.9556E+18	4.1189E-04	0.0000	0.0495	0.0000	0.0000
Co-58	70.860	d	0.10	9.5350E+13	2.9176E-04	0.9770	0.0036	0.0300	0.0000
Se-75	119.70	d	0.20	1.4307E+14	2.5916E-04	0.3889	0.0000	0.0000	0.0000
Cr-51	27.710	d	0.01	2.5363E+13	1.9846E-04	0.0328	0.0031	0.0000	0.0000
Nb-95	34.990	d	0.02	3.0346E+13	1.8805E-04	0.7645	0.0434	0.0000	0.0000
Ba-133	10.540	y	0.09	3.1778E+15	1.7898E-04	0.4040	0.0547	0.0000	0.0000
Sb-124	60.200	d	0.05	4.9018E+13	1.7655E-04	1.8500	0.3900	0.0000	0.0000
Sm-151	89.992	y	6.66	2.1945E+16	1.4477E-04	0.0000	0.1250	0.0000	0.0000
Kr-85	10.750	y	0.21	1.7947E+15	9.9106E-05	0.0022	0.2507	0.0000	0.0000
Zr-95	64.030	d	0.01	2.6495E+13	8.9720E-05	0.7328	0.1200	0.0000	0.0000
Sr-85	64.850	d	0.01	2.2010E+13	7.3591E-05	0.5180	0.0081	0.0000	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000	0.0000
Ni-63	100.60	y	1.39	9.5050E+15	5.6088E-05	0.0000	0.0174	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000	0.0000
Sm-145	340.00	d	0.88	5.9164E+13	3.7730E-05	0.0652	0.0293	0.0000	0.0000
Sr-89	50.570	d	0.06	7.5982E+12	3.2578E-05	0.0010	0.5830	0.0000	0.0000
Ag-110	24.560	s	0.45	3.1605E+07	2.4108E-05	0.0340	1.1780	0.0000	0.0000
H-3	12.330	y	0.16	3.7798E+14	1.8198E-05	0.0000	0.0057	0.0000	0.0000
Rb-86	18.630	d	0.11	4.7571E+11	5.5366E-06	0.0957	0.6670	0.0000	0.0000
Pu-239	24111.	y	0.05	2.0409E+17	5.0252E-06	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.1821E+08	5.0222E-06	0.0000	0.0000	0.0000	0.0000
Y-91	58.510	d	0.10	1.1822E+12	4.3811E-06	0.0046	0.6032	0.0000	0.0000
Ag-108m	418.01	y	3.59	2.2746E+15	3.2303E-06	1.6800	0.0151	0.0000	0.0000
Lu-177m	160.30	d	0.25	1.8243E+12	2.4676E-06	0.9980	0.0252	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.1011E+05	1.9099E-06	1.0640	0.2404	0.0000	0.0000
Pm-145	17.700	y	2.26	5.6504E+13	1.8951E-06	0.0332	0.0136	0.0000	0.0000
Nb-94	19990.	y	12.33	5.0412E+16	1.4971E-06	1.5720	0.1460	0.0000	0.0000
U-233	0.15930E+06	y	0.13	3.6013E+17	1.3420E-06	0.0013	0.0000	0.0000	4.8130
Nb-95m	3.6090	d	0.92	1.7092E+10	1.0269E-06	0.0712	0.1710	0.0000	0.0000
Lu-177	6.6470	d	0.60	1.7836E+10	5.8180E-07	0.0333	0.1342	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155351D+20

Total number of nuclides = 418
Total activity (Ci) = 2.8851

Total number of decays = 1.94168E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 28.273
Average chain length = 1.0247

Average gamma E (MeV) = 0.81789
Average beta E (MeV) = 8.19173E-02
Average alpha E (MeV) = 1.11232E-05

Composite Exposure Rate Conversion Factor = 14.1707973 R/hr per Ci/m2
Composite ECF per FGR table = 14.7745075 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.2236357 Rem/hr per Ci/m2

Ground Source

Point in time = 1.14079583 yrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	4.2884E+18	0.9308	0.0016	0.0038	0.0000
Co-60	5.2701	y	0.02	5.0365E+18	0.5673	2.5030	0.0964	0.0000
Ar-39	269.01	y	3.35	1.8555E+20	0.4095	0.0002	0.2188	0.0000
Cs-134	2.0650	y	0.03	7.2311E+17	0.2079	1.5500	0.1640	0.0000
Mn-54	312.20	d	0.01	2.6292E+17	0.1826	0.8359	0.0034	0.0000
Eu-152	13.520	y	0.10	1.9439E+18	8.5353E-02	1.1600	0.1270	0.0001
Ca-45	163.00	d	0.61	6.3128E+16	8.3974E-02	0.0000	0.0769	0.0000
Ta-182	114.70	d	0.35	1.7866E+16	3.3773E-02	1.2910	0.2070	0.0000
Sc-46	83.780	d	0.02	1.2345E+16	3.1949E-02	2.0090	0.1118	0.0000
Eu-154	8.5942	y	0.04	3.5280E+17	2.4370E-02	1.2500	0.2790	0.0000
Zn-65	244.10	d	0.04	2.5543E+16	2.2689E-02	0.5900	0.0044	0.0000
S-35	87.310	d	0.18	5.7196E+15	1.4204E-02	0.0000	0.0486	0.0000
Ar-37	35.030	d	0.09	1.1691E+15	7.2361E-03	0.0002	0.0019	0.0000
Ag-110m	249.80	d	0.01	1.6219E+15	1.4078E-03	2.7400	0.0755	0.0000
Hf-175	70.000	d	1.43	4.2247E+14	1.3086E-03	0.3518	0.0000	0.0000
Fe-59	44.490	d	0.02	2.6502E+14	1.2916E-03	1.1880	0.1176	0.0000
Hf-181	42.380	d	0.14	1.4453E+14	7.3944E-04	0.5180	0.1204	0.0000
Tb-160	72.300	d	0.28	2.1913E+14	6.5717E-04	1.1300	0.2540	0.0000
Eu-155	4.7531	y	0.29	4.0611E+15	5.0721E-04	0.0613	0.0650	0.0000
C-14	5701.1	y	0.53	3.9555E+18	4.1187E-04	0.0000	0.0495	0.0000
Ba-133	10.540	y	0.09	3.1306E+15	1.7632E-04	0.4040	0.0547	0.0000
Se-75	119.70	d	0.20	8.8454E+13	1.6023E-04	0.3889	0.0000	0.0000
Sm-151	89.992	y	6.66	2.1907E+16	1.4451E-04	0.0000	0.1250	0.0000
Co-58	70.860	d	0.10	4.2320E+13	1.2949E-04	0.9770	0.0036	0.0300
Kr-85	10.750	y	0.21	1.7686E+15	9.7664E-05	0.0022	0.2507	0.0000
Nb-95	34.990	d	0.02	1.2688E+13	7.8627E-05	0.7645	0.0434	0.0000
Sb-124	60.200	d	0.05	1.8841E+13	6.7862E-05	1.8500	0.3900	0.0000
Pa-233	27.000	d	0.37	8.1521E+12	6.5466E-05	0.2175	0.0664	0.0000
Ca-41	0.10300E+06	y	3.88	1.1010E+19	6.3455E-05	0.0004	0.0023	0.0000
Ni-63	100.60	y	1.39	9.4901E+15	5.6001E-05	0.0000	0.0174	0.0000
Cl-36	0.30101E+06	y	1.00	2.2750E+19	4.4868E-05	0.0003	0.2466	0.0000
Zr-95	64.030	d	0.01	1.0783E+13	3.6516E-05	0.7328	0.1200	0.0000
Sm-145	340.00	d	0.88	4.9950E+13	3.1854E-05	0.0652	0.0293	0.0000
Sr-85	64.850	d	0.01	9.0605E+12	3.0294E-05	0.5180	0.0081	0.0000
Cr-51	27.710	d	0.01	3.1774E+12	2.4863E-05	0.0328	0.0031	0.0000
Ag-110	24.560	s	0.45	2.5101E+07	1.9146E-05	0.0340	1.1780	0.0000
H-3	12.330	y	0.16	3.7318E+14	1.7967E-05	0.0000	0.0057	0.0000
Sr-89	50.570	d	0.06	2.4344E+12	1.0438E-05	0.0010	0.5830	0.0000
Pu-239	24111.	y	0.05	2.0409E+17	5.0252E-06	0.0001	0.0000	5.1000
U-235m	26.000	m	7.69	4.1821E+08	5.0222E-06	0.0000	0.0000	0.0000
Ag-108m	418.01	y	3.59	2.2737E+15	3.2291E-06	1.6800	0.0151	0.0000
Pm-145	17.700	y	2.26	6.5175E+13	2.1859E-06	0.0332	0.0136	0.0000
Lu-177m	160.30	d	0.25	1.2739E+12	1.7232E-06	0.9980	0.0252	0.0000
Y-91	58.510	d	0.10	4.4205E+11	1.6381E-06	0.0046	0.6032	0.0000
Nb-94	19990.	y	12.33	5.0412E+16	1.4971E-06	1.5720	0.1460	0.0000
U-233	0.15930E+06	y	0.13	3.6019E+17	1.3423E-06	0.0013	0.0000	4.8130
Hf-177m	1.0800	s	5.56	7.6890E+04	1.3337E-06	1.0640	0.2404	0.0000
Cs-137	30.041	y	0.10	2.9250E+13	5.7802E-07	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	4.4598E+06	5.4565E-07	0.5990	0.0652	0.0000
Pm-147	2.6231	y	0.01	1.9320E+12	4.3725E-07	0.0000	0.0620	0.0000

Check of numerical solution:

Initial number of atoms = 6.702196336155351D+20
Current number of atoms = 6.702196336155349D+20

Total number of nuclides = 414
Total activity (Ci) = 2.6092

Total number of decays = 1.94895E+20
Asympt number of decays = 6.86756E+20
Percent of decays = 28.379
Average chain length = 1.0247

Average gamma E (MeV) = 0.82577
Average beta E (MeV) = 8.38430E-02
Average alpha E (MeV) = 1.22999E-05

Composite Exposure Rate Conversion Factor = 14.2645493 R/hr per Ci/m2
Composite ECF per FGR table = 14.9031324 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.3221207 Rem/hr per Ci/m2

Appendix B. Air Activation Source

This appendix contains a list of the fifty most-active radionuclides vs. time produced from the Hiroshima detonation. The points in time where chosen to be equally spaced in the logarithmic plane from 1×10^{-6} hours to 1×10^4 hours.

The activities that are presented are integrals over all space. The gamma and beta energies per decay listed in the table represent integrals over the emission spectrum for each radionuclide.

Air Source

Point in time = 0.00000000 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	1.6350E+15	1.5163E+06	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6110E+16	9.4877E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2880E+16	4.3775E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3920E+16	3.3948E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6130E+17	1.6350E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0980E+15	8399.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7890E+16	6450.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.8960E+13	1807.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0010E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8510E+14	831.6	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7690E+15	662.8	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0190E+14	342.9	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7860E+14	260.5	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6270E+14	13.31	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9250E+12	6.394	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3280E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2310E+13	3.313	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7060E+13	1.366	0.0139	0.0000	0.0000	0.0000
N-18	0.62200	s	1.45	2.6660E+10	0.8030	5.3500	3.8900	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
B-13	0.17330E-01	s	0.98	6.7080E+08	0.7251	0.3257	6.3490	0.0000	0.0000
Cl-38	37.200	m	0.27	6.8960E+13	0.5788	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7690E+15	0.2629	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7860E+14	0.2397	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.2998E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6640E+09	2.1815E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7640E+11	1.4171E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8370E+10	1.2930E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5550E+11	8.0919E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6130E+10	5.4941E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8700E+10	2.2245E-03	0.9540	0.7970	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 107
Total activity (Ci) = 8.61918E+06

Total number of decays = 0.0000
Asympt number of decays = 1.58748E+24
Percent of decays = 0.0000
Average chain length = 1.0000

Average gamma E (MeV) = 1.1117
Average beta E (MeV) = 1.5338
Average alpha E (MeV) = 2.20154E-07

Composite Exposure Rate Conversion Factor = 20.4628506 R/hr per Ci/m2
Composite ECF per FGR table = 18.2721977 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.8962975 Rem/hr per Ci/m2

Air Source

Point in time = 9.99999978E-03 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	1.1601E+15	1.0759E+06	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6075E+16	9.4785E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2864E+16	4.3763E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3907E+16	3.3930E+04	0.1310	0.0595	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	6.2530E-02	1.6735E+04	0.0000	0.0000	0.0000	0.0460
S-37	4.9900	m	0.40	2.6129E+17	1.6349E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0949E+15	8375.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7888E+16	6450.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.8295E+13	1789.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0010E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8479E+14	830.2	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7688E+15	662.7	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0177E+14	342.7	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7850E+14	260.4	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6270E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9226E+12	6.391	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3279E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2309E+13	3.313	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7059E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.6365E+10	0.7941	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	6.9625E+13	0.5844	1.5110	1.5200	0.0000	0.0000
B-13	0.17330E-01	s	0.98	4.4966E+08	0.4861	0.3257	6.3490	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7692E+15	0.2629	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7870E+14	0.2398	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.2998E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6559E+09	2.1784E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7639E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8365E+10	1.2929E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5550E+11	8.0918E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6128E+10	5.4934E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 162
Total activity (Ci) = 8.19531E+06

Total number of decays = 3.11032E+15
Asympt number of decays = 1.58748E+24
Percent of decays = 1.95928E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.1640
Average beta E (MeV) = 1.2716
Average alpha E (MeV) = 9.41618E-05

Composite Exposure Rate Conversion Factor = 21.4454193 R/hr per Ci/m2
Composite ECF per FGR table = 19.2172279 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.5503807 Rem/hr per Ci/m2

Air Source

Point in time = 1.55975576E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	9.5736E+14	8.8787E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6055E+16	9.4733E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2855E+16	4.3757E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3900E+16	3.3920E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6129E+17	1.6349E+04	2.9310	0.7998	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	5.1603E-02	1.3810E+04	0.0000	0.0000	0.0000	0.0460
C-15	2.4490	s	0.20	1.0932E+15	8362.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7886E+16	6450.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.7925E+13	1780.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0009E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8462E+14	829.4	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7686E+15	662.7	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0170E+14	342.6	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7845E+14	260.4	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6269E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9213E+12	6.390	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3278E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2308E+13	3.313	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7059E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.6201E+10	0.7891	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	6.9995E+13	0.5875	1.5110	1.5200	0.0000	0.0000
B-13	0.17330E-01	s	0.98	3.5946E+08	0.3886	0.3257	6.3490	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7694E+15	0.2630	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7875E+14	0.2398	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.2999E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6514E+09	2.1766E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7639E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8363E+10	1.2928E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5550E+11	8.0917E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6127E+10	5.4930E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 8.00427E+06

Total number of decays = 4.78723E+15
Asympt number of decays = 1.58748E+24
Percent of decays = 3.01561E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.1895
Average beta E (MeV) = 1.1526
Average alpha E (MeV) = 7.96024E-05

Composite Exposure Rate Conversion Factor = 21.9239998 R/hr per Ci/m2
Composite ECF per FGR table = 19.6758690 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.8692884 Rem/hr per Ci/m2

Air Source

Point in time = 1.94798186E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	8.3795E+14	7.7713E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6042E+16	9.4698E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2848E+16	4.3753E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3896E+16	3.3913E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6129E+17	1.6349E+04	2.9310	0.7998	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	4.5166E-02	1.2088E+04	0.0000	0.0000	0.0000	0.0460
C-15	2.4490	s	0.20	1.0920E+15	8353.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7885E+16	6449.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.7670E+13	1773.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0009E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8450E+14	828.9	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7685E+15	662.6	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0165E+14	342.5	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7841E+14	260.4	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6269E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9204E+12	6.389	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3277E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2308E+13	3.313	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7059E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.6088E+10	0.7857	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.0250E+13	0.5896	1.5110	1.5200	0.0000	0.0000
B-13	0.17330E-01	s	0.98	3.0777E+08	0.3327	0.3257	6.3490	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7695E+15	0.2630	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7879E+14	0.2398	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.2999E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6483E+09	2.1754E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7639E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8361E+10	1.2928E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5549E+11	8.0916E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6126E+10	5.4927E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.89174E+06

Total number of decays = 5.92874E+15
Asympt number of decays = 1.58748E+24
Percent of decays = 3.73468E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.2051
Average beta E (MeV) = 1.0798
Average alpha E (MeV) = 7.06973E-05

Composite Exposure Rate Conversion Factor = 22.2166862 R/hr per Ci/m2
Composite ECF per FGR table = 19.9564152 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.0643148 Rem/hr per Ci/m2

Air Source

Point in time = 2.43283808E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	7.0952E+14	6.5802E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6025E+16	9.4653E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2841E+16	4.3747E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3889E+16	3.3904E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6129E+17	1.6349E+04	2.9310	0.7998	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	3.8244E-02	1.0235E+04	0.0000	0.0000	0.0000	0.0460
C-15	2.4490	s	0.20	1.0905E+15	8342.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7884E+16	6449.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.7353E+13	1765.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0009E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8435E+14	828.2	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7684E+15	662.6	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0159E+14	342.4	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7837E+14	260.4	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6269E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9192E+12	6.388	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3276E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2307E+13	3.313	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7059E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.5947E+10	0.7815	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.0567E+13	0.5923	1.5110	1.5200	0.0000	0.0000
B-13	0.17330E-01	s	0.98	2.5351E+08	0.2740	0.3257	6.3490	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7696E+15	0.2630	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7883E+14	0.2398	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.2999E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6444E+09	2.1739E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7639E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8358E+10	1.2927E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5549E+11	8.0915E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6125E+10	5.4924E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.77070E+06

Total number of decays = 7.33333E+15
Asympt number of decays = 1.58748E+24
Percent of decays = 4.61947E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.2224
Average beta E (MeV) = 0.99923
Average alpha E (MeV) = 6.08312E-05

Composite Exposure Rate Conversion Factor = 22.5409260 R/hr per Ci/m2
Composite ECF per FGR table = 20.2672729 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.2803535 Rem/hr per Ci/m2

Air Source

Point in time = 3.03837620E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	5.7640E+14	5.3456E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.6003E+16	9.4597E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2831E+16	4.3740E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3882E+16	3.3894E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6128E+17	1.6349E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0886E+15	8327.	3.3580	2.9960	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	3.1068E-02	8315.	0.0000	0.0000	0.0000	0.0460
Cl-40	1.3500	m	1.48	2.7883E+16	6449.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.6958E+13	1754.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0009E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8417E+14	827.4	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7683E+15	662.5	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0151E+14	342.3	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7831E+14	260.4	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6269E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9178E+12	6.386	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3275E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2306E+13	3.312	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7058E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.5772E+10	0.7762	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.0961E+13	0.5956	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7697E+15	0.2630	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7889E+14	0.2398	0.2690	0.0323	0.0013	0.0000
B-13	0.17330E-01	s	0.98	1.9898E+08	0.2151	0.3257	6.3490	0.0000	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.3000E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6395E+09	2.1721E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7638E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8355E+10	1.2926E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5549E+11	8.0914E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6124E+10	5.4920E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.64522E+06

Total number of decays = 9.05981E+15
Asympt number of decays = 1.58748E+24
Percent of decays = 5.70703E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.2409
Average beta E (MeV) = 0.91298
Average alpha E (MeV) = 5.02755E-05

Composite Exposure Rate Conversion Factor = 22.8877792 R/hr per Ci/m2
Composite ECF per FGR table = 20.5999012 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.5114374 Rem/hr per Ci/m2

Air Source

Point in time = 3.79463360E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	4.4466E+14	4.1238E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.5977E+16	9.4528E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2819E+16	4.3732E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3872E+16	3.3880E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6128E+17	1.6348E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0863E+15	8309.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7881E+16	6448.	4.0690	1.5290	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	2.3967E-02	6414.	0.0000	0.0000	0.0000	0.0460
Cl-38m	0.71500	s	0.42	6.6469E+13	1742.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0009E+16	940.1	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8394E+14	826.3	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7681E+15	662.5	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0142E+14	342.1	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7823E+14	260.3	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6268E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9160E+12	6.384	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3274E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2305E+13	3.312	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7058E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.5556E+10	0.7697	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.1450E+13	0.5997	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7699E+15	0.2630	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7897E+14	0.2399	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
B-13	0.17330E-01	s	0.98	1.4704E+08	0.1590	0.3257	6.3490	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.3000E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2740E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6335E+09	2.1697E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7638E+11	1.4170E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8352E+10	1.2925E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5549E+11	8.0913E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6122E+10	5.4915E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.52100E+06

Total number of decays = 1.11809E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 7.04318E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.2598
Average beta E (MeV) = 0.82478
Average alpha E (MeV) = 3.94821E-05

Composite Exposure Rate Conversion Factor = 23.2423573 R/hr per Ci/m2
Composite ECF per FGR table = 20.9400959 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.7476463 Rem/hr per Ci/m2

Air Source

Point in time = 4.73912507E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	3.2157E+14	2.9822E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.5944E+16	9.4441E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2803E+16	4.3721E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3861E+16	3.3863E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6127E+17	1.6348E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0834E+15	8287.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7879E+16	6448.	4.0690	1.5290	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	1.7333E-02	4639.	0.0000	0.0000	0.0000	0.0460
Cl-38m	0.71500	s	0.42	6.5863E+13	1726.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0008E+16	940.0	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8365E+14	825.0	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7678E+15	662.4	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0130E+14	341.9	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7814E+14	260.3	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6268E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9138E+12	6.382	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3273E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2304E+13	3.312	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2820E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7058E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.5289E+10	0.7617	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.2056E+13	0.6048	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7702E+15	0.2631	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7906E+14	0.2399	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
B-13	0.17330E-01	s	0.98	1.0078E+08	0.1089	0.3257	6.3490	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2820E+14	7.3000E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2739E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6259E+09	2.1668E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9656E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7638E+11	1.4169E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8347E+10	1.2924E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5549E+11	8.0912E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6120E+10	5.4908E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5550E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.40491E+06

Total number of decays = 1.37879E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 8.68536E-07
Average chain length = 1.0000

Average gamma E (MeV) = 1.2780
Average beta E (MeV) = 0.73970
Average alpha E (MeV) = 2.90708E-05

Composite Exposure Rate Conversion Factor = 23.5842648 R/hr per Ci/m2
Composite ECF per FGR table = 21.2683563 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.9753637 Rem/hr per Ci/m2

Air Source

Point in time = 5.91870211E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	2.1453E+14	1.9896E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.5903E+16	9.4333E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2784E+16	4.3708E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3846E+16	3.3842E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6126E+17	1.6348E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0798E+15	8260.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7876E+16	6447.	4.0690	1.5290	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	1.1563E-02	3095.	0.0000	0.0000	0.0000	0.0460
Cl-38m	0.71500	s	0.42	6.5115E+13	1706.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0008E+16	940.0	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8329E+14	823.4	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7675E+15	662.3	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0115E+14	341.6	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7803E+14	260.3	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6267E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9110E+12	6.379	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3271E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2303E+13	3.311	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2819E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7057E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.4958E+10	0.7517	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.2804E+13	0.6111	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7705E+15	0.2631	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7917E+14	0.2399	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2821E+14	7.3001E-02	0.2490	0.3190	0.0000	0.0000
B-13	0.17330E-01	s	0.98	6.2876E+07	6.7969E-02	0.3257	6.3490	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2739E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6164E+09	2.1632E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1080E+12	1.9655E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7637E+11	1.4169E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8342E+10	1.2923E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5548E+11	8.0910E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6118E+10	5.4900E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5549E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.30390E+06

Total number of decays = 1.69962E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 1.07064E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.2943
Average beta E (MeV) = 0.66350
Average alpha E (MeV) = 1.97482E-05

Composite Exposure Rate Conversion Factor = 23.8902283 R/hr per Ci/m2
Composite ECF per FGR table = 21.5624695 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1790752 Rem/hr per Ci/m2

Air Source

Point in time = 7.39187896E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
B-12	0.20200E-01	s	0.10	1.2940E+14	1.2001E+05	0.0950	6.3550	0.0000	0.0000
N-16	7.1300	s	0.28	3.5851E+16	9.4198E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2760E+16	4.3691E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3827E+16	3.3816E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6126E+17	1.6347E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0753E+15	8225.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7872E+16	6446.	4.0690	1.5290	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	6.9749E-03	1867.	0.0000	0.0000	0.0000	0.0460
Cl-38m	0.71500	s	0.42	6.4191E+13	1682.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0007E+16	940.0	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8284E+14	821.4	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7672E+15	662.1	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0096E+14	341.3	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7789E+14	260.2	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6266E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9075E+12	6.375	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3269E+13	4.025	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2301E+13	3.311	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2819E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7056E+13	1.366	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.4552E+10	0.7395	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.3727E+13	0.6188	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7708E+15	0.2632	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7931E+14	0.2400	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2821E+14	7.3002E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2739E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
B-13	0.17330E-01	s	0.98	3.4881E+07	3.7706E-02	0.3257	6.3490	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.6046E+09	2.1586E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1079E+12	1.9655E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7636E+11	1.4169E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8335E+10	1.2921E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5548E+11	8.0908E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6115E+10	5.4890E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5549E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.22347E+06

Total number of decays = 2.09536E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 1.31993E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3076
Average beta E (MeV) = 0.60137
Average alpha E (MeV) = 1.21480E-05

Composite Exposure Rate Conversion Factor = 24.1393833 R/hr per Ci/m2
Composite ECF per FGR table = 21.8025036 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.3448677 Rem/hr per Ci/m2

Air Source

Point in time = 9.23173055E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.5787E+16	9.4029E+04	4.6030	2.6930	0.0000	0.0000
B-12	0.20200E-01	s	0.10	6.8827E+13	6.3831E+04	0.0950	6.3550	0.0000	0.0000
O-19	26.910	s	0.30	6.2731E+16	4.3671E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3804E+16	3.3784E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6124E+17	1.6346E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0697E+15	8183.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7868E+16	6445.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.3056E+13	1652.	0.6710	0.0000	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	3.7099E-03	992.8	0.0000	0.0000	0.0000	0.0460
N-13	9.9670	m	0.04	3.0007E+16	940.0	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8228E+14	818.9	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7667E+15	662.0	0.0408	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	2.0073E+14	340.9	1.6340	2.4810	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7771E+14	260.2	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6265E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.9032E+12	6.370	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3266E+13	4.024	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2299E+13	3.310	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2819E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7055E+13	1.365	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.4054E+10	0.7245	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.4861E+13	0.6283	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7713E+15	0.2632	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7949E+14	0.2400	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1510E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2821E+14	7.3003E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2739E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.5900E+09	2.1530E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1079E+12	1.9655E-02	0.0800	0.7182	0.0081	0.0000
B-13	0.17330E-01	s	0.98	1.6711E+07	1.8064E-02	0.3257	6.3490	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7635E+11	1.4168E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8326E+10	1.2918E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5547E+11	8.0905E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6111E+10	5.4877E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5549E+11	2.4920E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228204D+24

Total number of nuclides = 162
Total activity (Ci) = 7.16611E+06

Total number of decays = 2.58494E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 1.62832E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3172
Average beta E (MeV) = 0.55627
Average alpha E (MeV) = 6.63562E-06

Composite Exposure Rate Conversion Factor = 24.3196659 R/hr per Ci/m2
Composite ECF per FGR table = 21.9769783 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.4646797 Rem/hr per Ci/m2

Air Source

Point in time = 0.115295239 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8928E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.5708E+16	9.3820E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2694E+16	4.3645E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3776E+16	3.3743E+04	0.1310	0.0595	0.0000	0.0000
B-12	0.20200E-01	s	0.10	3.1285E+13	2.9014E+04	0.0950	6.3550	0.0000	0.0000
S-37	4.9900	m	0.40	2.6123E+17	1.6345E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0627E+15	8130.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7862E+16	6444.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	6.1667E+13	1616.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0006E+16	940.0	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.8159E+14	815.8	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7662E+15	661.7	0.0408	0.0000	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	1.6863E-03	451.3	0.0000	0.0000	0.0000	0.0460
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030	s	0.27	2.0044E+14	340.4	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7749E+14	260.1	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6264E+14	13.30	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.8978E+12	6.364	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3263E+13	4.024	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2296E+13	3.310	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2819E+14	2.618	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7054E+13	1.365	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000	0.0000
N-18	0.62200	s	1.45	2.3446E+10	0.7061	5.3500	3.8900	0.0000	0.0000
Cl-38	37.200	m	0.27	7.6250E+13	0.6400	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7718E+15	0.2633	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.7971E+14	0.2401	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1509E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0190E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2821E+14	7.3004E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2739E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.5717E+09	2.1459E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1079E+12	1.9655E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7634E+11	1.4168E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8315E+10	1.2915E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5547E+11	8.0901E-03	2.7620	0.9100	0.0000	0.0000
B-13	0.17330E-01	s	0.98	6.6660E+06	7.2059E-03	0.3257	6.3490	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6107E+10	5.4861E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5549E+11	2.4919E-03	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.13036E+06

Total number of decays = 3.19247E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 2.01103E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3231
Average beta E (MeV) = 0.52792
Average alpha E (MeV) = 3.17455E-06

Composite Exposure Rate Conversion Factor = 24.4322376 R/hr per Ci/m2
Composite ECF per FGR table = 22.0870914 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5392723 Rem/hr per Ci/m2

Air Source

Point in time = 0.143992454 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8927E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.5608E+16	9.3558E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.2647E+16	4.3613E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.3740E+16	3.3692E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6121E+17	1.6344E+04	2.9310	0.7998	0.0000
B-12	0.20200E-01	s	0.10	1.1686E+13	1.0838E+04	0.0950	6.3550	0.0000
C-15	2.4490	s	0.20	1.0542E+15	8064.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7856E+16	6442.	4.0690	1.5290	0.0000
Cl-38m	0.71500	s	0.42	5.9975E+13	1571.	0.6710	0.0000	0.0000
N-13	9.9670	m	0.04	3.0005E+16	939.9	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9300E+17	833.2	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.8072E+14	811.9	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7655E+15	661.5	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	2.0008E+14	339.8	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7721E+14	260.0	0.1160	0.1370	0.0000
Be-8	0.70000E-16	s	28.57	6.2990E-04	168.6	0.0000	0.0000	0.0460
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6263E+14	13.30	0.1960	1.7030	0.0000
Se-77m	17.360	s	0.29	5.8910E+12	6.357	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3259E+13	4.024	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2292E+13	3.309	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2819E+14	2.618	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7053E+13	1.365	0.0139	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4170E+14	0.7957	1.4500	0.8276	0.0000
N-18	0.62200	s	1.45	2.2708E+10	0.6839	5.3500	3.8900	0.0000
Cl-38	37.200	m	0.27	7.7941E+13	0.6542	1.5110	1.5200	0.0000
Kr-79	1.4590	d	0.29	1.7725E+15	0.2634	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.7999E+14	0.2402	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1509E+13	0.1948	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0189E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2821E+14	7.3006E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2738E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000
Br-79m	4.8640	s	0.72	5.5490E+09	2.1372E-02	0.1596	0.0000	0.0000
Br-80	17.600	m	0.28	1.1079E+12	1.9654E-02	0.0800	0.7182	0.0000
Br-82m	6.0900	m	1.15	2.7632E+11	1.4167E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.8301E+10	1.2912E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5546E+11	8.0897E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.6101E+10	5.4841E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5549E+11	2.4919E-03	0.0631	0.5420	0.0000
B-13	0.17330E-01	s	0.98	2.1153E+06	2.2867E-03	0.3257	6.3490	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.11142E+06

Total number of decays = 3.94841E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 2.48721E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3262
Average beta E (MeV) = 0.51294
Average alpha E (MeV) = 1.35355E-06

Composite Exposure Rate Conversion Factor = 24.4905682 R/hr per Ci/m2
Composite ECF per FGR table = 22.1458378 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5776024 Rem/hr per Ci/m2

Air Source

Point in time = 0.179832458 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4200E+21	6.8927E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.5484E+16	9.3233E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.2589E+16	4.3572E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.3695E+16	3.3629E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6119E+17	1.6343E+04	2.9310	0.7998	0.0000
C-15	2.4490	s	0.20	1.0435E+15	7982.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7847E+16	6440.	4.0690	1.5290	0.0000
B-12	0.20200E-01	s	0.10	3.4164E+12	3168.	0.0950	6.3550	0.0000
Cl-38m	0.71500	s	0.42	5.7927E+13	1518.	0.6710	0.0000	0.0000
N-13	9.9670	m	0.04	3.0004E+16	939.9	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9299E+17	833.2	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.7965E+14	807.1	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7646E+15	661.1	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.9963E+14	339.1	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7687E+14	259.9	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Be-8	0.70000E-16	s	28.57	1.8415E-04	49.28	0.0000	0.0000	0.0460
Xe-137	3.8180	m	0.34	1.6261E+14	13.30	0.1960	1.7030	0.0000
Se-77m	17.360	s	0.29	5.8826E+12	6.348	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3140E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3253E+13	4.024	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2288E+13	3.307	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2818E+14	2.618	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7051E+13	1.365	0.0139	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4169E+14	0.7957	1.4500	0.8276	0.0000
Cl-38	37.200	m	0.27	7.9988E+13	0.6714	1.5110	1.5200	0.0000
N-18	0.62200	s	1.45	2.1819E+10	0.6571	5.3500	3.8900	0.0000
Kr-79	1.4590	d	0.29	1.7734E+15	0.2635	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.8033E+14	0.2403	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1509E+13	0.1948	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0189E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2822E+14	7.3008E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1510E+13	6.2738E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000
Br-79m	4.8640	s	0.72	5.5207E+09	2.1263E-02	0.1596	0.0000	0.0000
Br-80	17.600	m	0.28	1.1079E+12	1.9654E-02	0.0800	0.7182	0.0000
Br-82m	6.0900	m	1.15	2.7631E+11	1.4166E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.8284E+10	1.2907E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5545E+11	8.0891E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.6093E+10	5.4816E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5548E+11	2.4919E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8686E+10	2.2241E-03	0.9540	0.7970	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.10303E+06

Total number of decays = 4.89078E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 3.08084E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3274
Average beta E (MeV) = 0.50652
Average alpha E (MeV) = 5.81673E-07

Composite Exposure Rate Conversion Factor = 24.5140228 R/hr per Ci/m2
Composite ECF per FGR table = 22.1718864 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5925560 Rem/hr per Ci/m2

Air Source

Point in time = 0.224593058 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4199E+21	6.8927E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.5330E+16	9.2828E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.2517E+16	4.3522E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.3640E+16	3.3550E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6116E+17	1.6341E+04	2.9310	0.7998	0.0000
C-15	2.4490	s	0.20	1.0304E+15	7882.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7836E+16	6438.	4.0690	1.5290	0.0000
Cl-38m	0.71500	s	0.42	5.5468E+13	1453.	0.6710	0.0000	0.0000
N-13	9.9670	m	0.04	3.0002E+16	939.9	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9299E+17	833.2	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.7832E+14	801.1	0.0420	1.7200	0.0000
B-12	0.20200E-01	s	0.10	7.3540E+11	682.0	0.0950	6.3550	0.0000
Kr-79m	50.000	s	6.00	1.7635E+15	660.7	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.9907E+14	338.1	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7644E+14	259.7	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6259E+14	13.30	0.1960	1.7030	0.0000
Be-8	0.70000E-16	s	28.57	3.9639E-05	10.61	0.0000	0.0000	0.0460
Se-77m	17.360	s	0.29	5.8721E+12	6.337	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3139E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3247E+13	4.024	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2282E+13	3.306	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2818E+14	2.617	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7049E+13	1.365	0.0139	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4169E+14	0.7957	1.4500	0.8276	0.0000
Cl-38	37.200	m	0.27	8.2447E+13	0.6920	1.5110	1.5200	0.0000
N-18	0.62200	s	1.45	2.0757E+10	0.6252	5.3500	3.8900	0.0000
Kr-79	1.4590	d	0.29	1.7745E+15	0.2637	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.8076E+14	0.2404	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1509E+13	0.1948	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0189E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2822E+14	7.3010E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1509E+13	6.2737E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000
Br-79m	4.8640	s	0.72	5.4856E+09	2.1128E-02	0.1596	0.0000	0.0000
Br-80	17.600	m	0.28	1.1078E+12	1.9653E-02	0.0800	0.7182	0.0000
Br-82m	6.0900	m	1.15	2.7628E+11	1.4165E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.8263E+10	1.2902E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5543E+11	8.0884E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.6084E+10	5.4786E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5548E+11	2.4919E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8682E+10	2.2240E-03	0.9540	0.7970	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.09976E+06

Total number of decays = 6.06682E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 3.82166E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3276
Average beta E (MeV) = 0.50431
Average alpha E (MeV) = 3.30228E-07

Composite Exposure Rate Conversion Factor = 24.5198917 R/hr per Ci/m2
Composite ECF per FGR table = 22.1819630 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5956230 Rem/hr per Ci/m2

Air Source

Point in time = 0.280494660 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4199E+21	6.8926E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.5139E+16	9.2325E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2427E+16	4.3460E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3570E+16	3.3451E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6113E+17	1.6339E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	1.0142E+15	7758.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7823E+16	6435.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	5.2542E+13	1377.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	3.0000E+16	939.8	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9299E+17	833.2	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.7667E+14	793.7	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7621E+15	660.2	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030	s	0.27	1.9837E+14	336.9	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7590E+14	259.6	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
B-12	0.20200E-01	s	0.10	1.0801E+11	100.2	0.0950	6.3550	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6256E+14	13.29	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.8590E+12	6.323	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3139E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0210E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3238E+13	4.023	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2276E+13	3.304	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2817E+14	2.617	0.4320	0.0984	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	5.8217E-06	1.558	0.0000	0.0000	0.0000	0.0460
Se-79m	3.9000	m	0.51	1.7046E+13	1.365	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4169E+14	0.7957	1.4500	0.8276	0.0000	0.0000
Cl-38	37.200	m	0.27	8.5372E+13	0.7165	1.5110	1.5200	0.0000	0.0000
N-18	0.62200	s	1.45	1.9503E+10	0.5874	5.3500	3.8900	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7759E+15	0.2639	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.8130E+14	0.2406	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1509E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0189E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2823E+14	7.3013E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1509E+13	6.2736E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.4421E+09	2.0960E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1078E+12	1.9653E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7625E+11	1.4163E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8236E+10	1.2894E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5542E+11	8.0876E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6073E+10	5.4747E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5547E+11	2.4919E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8678E+10	2.2239E-03	0.9540	0.7970	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.09825E+06

Total number of decays = 7.53513E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 4.74659E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3275
Average beta E (MeV) = 0.50363
Average alpha E (MeV) = 2.70231E-07

Composite Exposure Rate Conversion Factor = 24.5188808 R/hr per Ci/m2
Composite ECF per FGR table = 22.1865177 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5938988 Rem/hr per Ci/m2

Air Source

Point in time = 0.350310326 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4199E+21	6.8926E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.4901E+16	9.1700E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2315E+16	4.3381E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3484E+16	3.3329E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6109E+17	1.6337E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	9.9436E+14	7606.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7807E+16	6431.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	4.9103E+13	1287.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	2.9998E+16	939.7	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9299E+17	833.1	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.7463E+14	784.5	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7604E+15	659.6	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030	s	0.27	1.9750E+14	335.4	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7523E+14	259.3	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6253E+14	13.29	0.1960	1.7030	0.0000	0.0000
B-12	0.20200E-01	s	0.10	9.8407E+09	9.126	0.0950	6.3550	0.0000	0.0000
Se-77m	17.360	s	0.29	5.8427E+12	6.305	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3139E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0209E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3228E+13	4.023	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2267E+13	3.302	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2817E+14	2.617	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7042E+13	1.364	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4169E+14	0.7957	1.4500	0.8276	0.0000	0.0000
Cl-38	37.200	m	0.27	8.8808E+13	0.7454	1.5110	1.5200	0.0000	0.0000
N-18	0.62200	s	1.45	1.8043E+10	0.5434	5.3500	3.8900	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7776E+15	0.2642	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.8197E+14	0.2408	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1508E+13	0.1948	0.0080	0.6107	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	5.3042E-07	0.1420	0.0000	0.0000	0.0000	0.0460
Br-83	2.4000	h	0.83	6.0188E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2823E+14	7.3017E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1509E+13	6.2736E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.3882E+09	2.0753E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1078E+12	1.9652E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7622E+11	1.4161E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8203E+10	1.2885E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5540E+11	8.0865E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6059E+10	5.4699E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5547E+11	2.4919E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8672E+10	2.2238E-03	0.9540	0.7970	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.09703E+06

Total number of decays = 9.36858E+16
Asympt number of decays = 1.58748E+24
Percent of decays = 5.90153E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3272
Average beta E (MeV) = 0.50331
Average alpha E (MeV) = 2.59340E-07

Composite Exposure Rate Conversion Factor = 24.5155334 R/hr per Ci/m2
Composite ECF per FGR table = 22.1901531 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5903702 Rem/hr per Ci/m2

Air Source

Point in time = 0.437503278 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4199E+21	6.8925E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.4606E+16	9.0926E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.2175E+16	4.3284E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.3377E+16	3.3177E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6104E+17	1.6333E+04	2.9310	0.7998	0.0000	0.0000
C-15	2.4490	s	0.20	9.7012E+14	7421.	3.3580	2.9960	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7786E+16	6426.	4.0690	1.5290	0.0000	0.0000
Cl-38m	0.71500	s	0.42	4.5123E+13	1182.	0.6710	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	2.9995E+16	939.6	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9299E+17	833.1	0.0026	0.0382	0.0000	0.0000
N-17	4.1700	s	0.10	1.7212E+14	773.2	0.0420	1.7200	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7583E+15	658.8	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030	s	0.27	1.9642E+14	333.6	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.7440E+14	259.1	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6248E+14	13.29	0.1960	1.7030	0.0000	0.0000
Se-77m	17.360	s	0.29	5.8224E+12	6.283	0.0888	0.0000	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3139E+15	6.171	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0209E+15	4.177	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3215E+13	4.022	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2256E+13	3.299	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2816E+14	2.617	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.7038E+13	1.364	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4169E+14	0.7957	1.4500	0.8276	0.0000	0.0000
Cl-38	37.200	m	0.27	9.2786E+13	0.7788	1.5110	1.5200	0.0000	0.0000
N-18	0.62200	s	1.45	1.6373E+10	0.4931	5.3500	3.8900	0.0000	0.0000
B-12	0.20200E-01	s	0.10	4.9390E+08	0.4580	0.0950	6.3550	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7797E+15	0.2645	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.8280E+14	0.2410	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1508E+13	0.1947	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0188E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2824E+14	7.3021E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1509E+13	6.2735E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000	0.0000
Br-79m	4.8640	s	0.72	5.3217E+09	2.0496E-02	0.1596	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.1077E+12	1.9651E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7617E+11	1.4159E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.8161E+10	1.2874E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5537E+11	8.0851E-03	2.7620	0.9100	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	2.6621E-08	7.1245E-03	0.0000	0.0000	0.0000	0.0460
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.6041E+10	5.4639E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5546E+11	2.4918E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8665E+10	2.2236E-03	0.9540	0.7970	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 162
Total activity (Ci) = 7.09562E+06

Total number of decays = 1.16579E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 7.34367E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3269
Average beta E (MeV) = 0.50299
Average alpha E (MeV) = 2.56335E-07

Composite Exposure Rate Conversion Factor = 24.5110416 R/hr per Ci/m2
Composite ECF per FGR table = 22.1943016 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5857658 Rem/hr per Ci/m2

Air Source

Point in time = 0.546398699 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4199E+21	6.8924E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.4242E+16	8.9969E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.2001E+16	4.3163E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.3243E+16	3.2988E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6097E+17	1.6329E+04	2.9310	0.7998	0.0000
C-15	2.4490	s	0.20	9.4067E+14	7196.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7760E+16	6420.	4.0690	1.5290	0.0000
Cl-38m	0.71500	s	0.42	4.0602E+13	1064.	0.6710	0.0000	0.0000
N-13	9.9670	m	0.04	2.9991E+16	939.5	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9298E+17	833.1	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.6903E+14	759.4	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7557E+15	657.8	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.9509E+14	331.3	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7335E+14	258.7	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6243E+14	13.28	0.1960	1.7030	0.0000
Se-77m	17.360	s	0.29	5.7971E+12	6.256	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3139E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0209E+15	4.177	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3199E+13	4.021	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2243E+13	3.295	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2815E+14	2.617	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7032E+13	1.364	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	9.7303E+13	0.8167	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4168E+14	0.7956	1.4500	0.8276	0.0000
N-18	0.62200	s	1.45	1.4502E+10	0.4368	5.3500	3.8900	0.0000
Kr-79	1.4590	d	0.29	1.7823E+15	0.2649	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.8384E+14	0.2414	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1507E+13	0.1947	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0188E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2825E+14	7.3027E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1509E+13	6.2733E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3460E-02	0.0463	0.1360	0.0000
Br-79m	4.8640	s	0.72	5.2397E+09	2.0181E-02	0.1596	0.0000	0.0000
Br-80	17.600	m	0.28	1.1076E+12	1.9650E-02	0.0800	0.7182	0.0081
Br-82m	6.0900	m	1.15	2.7611E+11	1.4156E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.8109E+10	1.2861E-02	0.9726	1.2730	0.0000
B-12	0.20200E-01	s	0.10	1.1771E+07	1.0917E-02	0.0950	6.3550	0.0000
Br-84m	6.0000	m	3.33	1.5534E+11	8.0834E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.6019E+10	5.4564E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5545E+11	2.4918E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8657E+10	2.2234E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5176E+11	1.8954E-03	0.4220	0.7210	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 162
Total activity (Ci) = 7.09390E+06

Total number of decays = 1.45165E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 9.14436E-06
Average chain length = 1.0000

Average gamma E (MeV) = 1.3264
Average beta E (MeV) = 0.50261
Average alpha E (MeV) = 2.53653E-07

Composite Exposure Rate Conversion Factor = 24.5054474 R/hr per Ci/m2
Composite ECF per FGR table = 22.1993618 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5800476 Rem/hr per Ci/m2

Air Source

Point in time = 0.682398140 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4198E+21	6.8923E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.3792E+16	8.8787E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.1784E+16	4.3012E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.3078E+16	3.2753E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6089E+17	1.6324E+04	2.9310	0.7998	0.0000
C-15	2.4490	s	0.20	9.0515E+14	6924.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7728E+16	6413.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.9986E+16	939.4	1.0200	0.0000	0.4909
Cl-38m	0.71500	s	0.42	3.5587E+13	932.4	0.6710	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.9298E+17	833.1	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.6525E+14	742.4	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7523E+15	656.6	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.9342E+14	328.5	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7205E+14	258.3	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6236E+14	13.28	0.1960	1.7030	0.0000
Se-77m	17.360	s	0.29	5.7657E+12	6.222	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3138E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0209E+15	4.177	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3178E+13	4.020	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2227E+13	3.291	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2813E+14	2.617	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7026E+13	1.363	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.0231E+14	0.8587	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4168E+14	0.7956	1.4500	0.8276	0.0000
N-18	0.62200	s	1.45	1.2462E+10	0.3753	5.3500	3.8900	0.0000
Kr-79	1.4590	d	0.29	1.7856E+15	0.2654	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.8514E+14	0.2418	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1507E+13	0.1947	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0187E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2826E+14	7.3034E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1508E+13	6.2731E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-79m	4.8640	s	0.72	5.1391E+09	1.9793E-02	0.1596	0.0000	0.0000
Br-80	17.600	m	0.28	1.1075E+12	1.9648E-02	0.0800	0.7182	0.0081
Br-82m	6.0900	m	1.15	2.7604E+11	1.4152E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.8045E+10	1.2843E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5530E+11	8.0813E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.5992E+10	5.4470E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5544E+11	2.4917E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8646E+10	2.2231E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5175E+11	1.8953E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5546E+11	1.5264E-03	1.7680	1.2360	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.09180E+06

Total number of decays = 1.80856E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 1.13926E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3258
Average beta E (MeV) = 0.50215
Average alpha E (MeV) = 2.50394E-07

Composite Exposure Rate Conversion Factor = 24.4985447 R/hr per Ci/m2
Composite ECF per FGR table = 22.2055492 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5729980 Rem/hr per Ci/m2

Air Source

Point in time = 0.852248371 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4198E+21	6.8922E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.3239E+16	8.7333E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.1515E+16	4.2824E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.2873E+16	3.2462E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6078E+17	1.6318E+04	2.9310	0.7998	0.0000
C-15	2.4490	s	0.20	8.6267E+14	6599.	3.3580	2.9960	0.0000
Cl-40	1.3500	m	1.48	2.7687E+16	6404.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.9980E+16	939.2	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9297E+17	833.1	0.0026	0.0382	0.0000
Cl-38m	0.71500	s	0.42	3.0184E+13	790.9	0.6710	0.0000	0.0000
N-17	4.1700	s	0.10	1.6065E+14	721.7	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7482E+15	655.0	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.9137E+14	325.0	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.7043E+14	257.7	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6228E+14	13.27	0.1960	1.7030	0.0000
Se-77m	17.360	s	0.29	5.7268E+12	6.180	0.0888	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3138E+15	6.171	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0209E+15	4.176	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3153E+13	4.019	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2206E+13	3.285	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2812E+14	2.616	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7017E+13	1.362	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.0771E+14	0.9040	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4167E+14	0.7956	1.4500	0.8276	0.0000
N-18	0.62200	s	1.45	1.0313E+10	0.3106	5.3500	3.8900	0.0000
Kr-79	1.4590	d	0.29	1.7898E+15	0.2660	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.8676E+14	0.2423	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1506E+13	0.1947	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0186E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2828E+14	7.3043E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1508E+13	6.2729E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1074E+12	1.9646E-02	0.0800	0.7182	0.0081
Br-79m	4.8640	s	0.72	5.0162E+09	1.9320E-02	0.1596	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7595E+11	1.4148E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.7964E+10	1.2822E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5525E+11	8.0787E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.5958E+10	5.4354E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5542E+11	2.4916E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8633E+10	2.2228E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5174E+11	1.8951E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5545E+11	1.5263E-03	1.7680	1.2360	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 161
Total activity (Ci) = 7.08923E+06

Total number of decays = 2.25416E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 1.41996E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3251
Average beta E (MeV) = 0.50157
Average alpha E (MeV) = 2.46383E-07

Composite Exposure Rate Conversion Factor = 24.4900551 R/hr per Ci/m2
Composite ECF per FGR table = 22.2130909 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5643311 Rem/hr per Ci/m2

Air Source

Point in time = 1.06437480 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4197E+21	6.8921E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.2560E+16	8.5551E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.1179E+16	4.2591E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.2620E+16	3.2102E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6066E+17	1.6310E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.7637E+16	6392.	4.0690	1.5290	0.0000
C-15	2.4490	s	0.20	8.1240E+14	6214.	3.3580	2.9960	0.0000
N-13	9.9670	m	0.04	2.9973E+16	938.9	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9297E+17	833.1	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.5508E+14	696.7	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7431E+15	653.1	0.0408	0.0000	0.0000
Cl-38m	0.71500	s	0.42	2.4574E+13	643.9	0.6710	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.8884E+14	320.7	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.6841E+14	257.1	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6218E+14	13.26	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3138E+15	6.171	0.1570	0.2282	0.0000
Se-77m	17.360	s	0.29	5.6785E+12	6.128	0.0888	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0208E+15	4.176	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3122E+13	4.017	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2180E+13	3.278	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2810E+14	2.616	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.7006E+13	1.362	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.1331E+14	0.9511	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4167E+14	0.7956	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	1.7949E+15	0.2667	0.2570	0.0053	0.0183
N-18	0.62200	s	1.45	8.1420E+09	0.2452	5.3500	3.8900	0.0000
Xe-125	16.900	h	1.18	7.8878E+14	0.2429	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1505E+13	0.1947	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0185E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2830E+14	7.3055E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1508E+13	6.2727E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1073E+12	1.9643E-02	0.0800	0.7182	0.0081
Br-79m	4.8640	s	0.72	4.8669E+09	1.8745E-02	0.1596	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7584E+11	1.4142E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.7863E+10	1.2795E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5518E+11	8.0754E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.5915E+10	5.4209E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5540E+11	2.4916E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8616E+10	2.2224E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5173E+11	1.8949E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5544E+11	1.5262E-03	1.7680	1.2360	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.08612E+06

Total number of decays = 2.81045E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 1.77038E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3243
Average beta E (MeV) = 0.50087
Average alpha E (MeV) = 2.41460E-07

Composite Exposure Rate Conversion Factor = 24.4796600 R/hr per Ci/m2
Composite ECF per FGR table = 22.2222309 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5537243 Rem/hr per Ci/m2

Air Source

Point in time = 1.32929909 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4197E+21	6.8919E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	3.1732E+16	8.3376E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	6.0763E+16	4.2301E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.2307E+16	3.1659E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6050E+17	1.6300E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.7575E+16	6377.	4.0690	1.5290	0.0000
C-15	2.4490	s	0.20	7.5371E+14	5766.	3.3580	2.9960	0.0000
N-13	9.9670	m	0.04	2.9964E+16	938.7	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9296E+17	833.1	0.0026	0.0382	0.0000
N-17	4.1700	s	0.10	1.4840E+14	666.7	0.0420	1.7200	0.0000
Kr-79m	50.000	s	6.00	1.7367E+15	650.7	0.0408	0.0000	0.0000
Cl-38m	0.71500	s	0.42	1.9008E+13	498.0	0.6710	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.8572E+14	315.4	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.6589E+14	256.2	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6205E+14	13.25	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3137E+15	6.171	0.1570	0.2282	0.0000
Se-77m	17.360	s	0.29	5.6187E+12	6.063	0.0888	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0208E+15	4.176	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.3082E+13	4.016	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2148E+13	3.270	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2807E+14	2.615	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.6993E+13	1.360	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.1887E+14	0.9977	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4166E+14	0.7955	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	1.8013E+15	0.2677	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.9129E+14	0.2437	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1504E+13	0.1947	0.0080	0.6107	0.0000
N-18	0.62200	s	1.45	6.0606E+09	0.1825	5.3500	3.8900	0.0000
Br-83	2.4000	h	0.83	6.0184E+13	0.1305	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2832E+14	7.3069E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1507E+13	6.2723E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1071E+12	1.9640E-02	0.0800	0.7182	0.0081
Br-79m	4.8640	s	0.72	4.6866E+09	1.8050E-02	0.1596	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7570E+11	1.4135E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.7738E+10	1.2761E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5510E+11	8.0712E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.5862E+10	5.4028E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5538E+11	2.4914E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8595E+10	2.2218E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5171E+11	1.8947E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5542E+11	1.5260E-03	1.7680	1.2360	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 161
Total activity (Ci) = 7.08236E+06

Total number of decays = 3.50486E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 2.20781E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3233
Average beta E (MeV) = 0.50001
Average alpha E (MeV) = 2.35446E-07

Composite Exposure Rate Conversion Factor = 24.4669991 R/hr per Ci/m2
Composite ECF per FGR table = 22.2332573 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5408115 Rem/hr per Ci/m2

Air Source

Point in time = 1.66016436 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4196E+21	6.8916E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	3.0728E+16	8.0736E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	6.0248E+16	4.1942E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.1923E+16	3.1114E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.6030E+17	1.6287E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.7497E+16	6359.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490	s	0.20	6.8633E+14	5250.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670	m	0.04	2.9952E+16	938.3	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9295E+17	833.0	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.7288E+15	647.7	0.0408	0.0000	0.0000	0.0000
N-17	4.1700	s	0.10	1.4046E+14	631.0	0.0420	1.7200	0.0000	0.0000
Cl-38m	0.71500	s	0.42	1.3792E+13	361.4	0.6710	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030	s	0.27	1.8190E+14	308.9	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.6276E+14	255.2	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.6188E+14	13.24	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3136E+15	6.171	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360	s	0.29	5.5450E+12	5.984	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0207E+15	4.176	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.3033E+13	4.013	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2108E+13	3.259	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2804E+14	2.615	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.6976E+13	1.359	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2407E+14	1.041	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4165E+14	0.7955	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.8092E+15	0.2689	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	7.9442E+14	0.2446	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1502E+13	0.1946	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0183E+13	0.1305	0.0065	0.3249	0.0000	0.0000
N-18	0.62200	s	1.45	4.1917E+09	0.1262	5.3500	3.8900	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2836E+14	7.3086E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1506E+13	6.2719E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6228E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	1.1069E+12	1.9636E-02	0.0800	0.7182	0.0081	0.0000
Br-79m	4.8640	s	0.72	4.4707E+09	1.7219E-02	0.1596	0.0000	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7553E+11	1.4126E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.7582E+10	1.2720E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5500E+11	8.0661E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.5796E+10	5.3803E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5535E+11	2.4913E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8569E+10	2.2212E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.5168E+11	1.8944E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.5541E+11	1.5259E-03	1.7680	1.2360	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 162
Total activity (Ci) = 7.07784E+06

Total number of decays = 4.37161E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 2.75380E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3220
Average beta E (MeV) = 0.49898
Average alpha E (MeV) = 2.28138E-07

Composite Exposure Rate Conversion Factor = 24.4516945 R/hr per Ci/m2
Composite ECF per FGR table = 22.2464771 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5251980 Rem/hr per Ci/m2

Air Source

Point in time = 2.07338262 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4195E+21	6.8913E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	2.9518E+16	7.7557E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	5.9610E+16	4.1498E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	2.1452E+16	3.0446E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.6005E+17	1.6271E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.7400E+16	6337.	4.0690	1.5290	0.0000
C-15	2.4490	s	0.20	6.1058E+14	4671.	3.3580	2.9960	0.0000
N-13	9.9670	m	0.04	2.9938E+16	937.8	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9294E+17	833.0	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.7189E+15	644.0	0.0408	0.0000	0.0000
N-17	4.1700	s	0.10	1.3114E+14	589.1	0.0420	1.7200	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
F-20	11.030	s	0.27	1.7724E+14	301.0	1.6340	2.4810	0.0000
Xe-125m	56.000	s	5.36	7.5887E+14	253.9	0.1160	0.1370	0.0000
Cl-38m	0.71500	s	0.42	9.2397E+12	242.1	0.6710	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.6168E+14	13.22	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3135E+15	6.171	0.1570	0.2282	0.0000
Sr-77m	17.360	s	0.29	5.4542E+12	5.886	0.0888	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0207E+15	4.176	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.2972E+13	4.010	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.2058E+13	3.246	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2800E+14	2.614	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.6956E+13	1.357	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2861E+14	1.079	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4164E+14	0.7954	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	1.8191E+15	0.2703	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	7.9831E+14	0.2458	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1500E+13	0.1946	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0181E+13	0.1305	0.0065	0.3249	0.0000
N-18	0.62200	s	1.45	2.6449E+09	7.9659E-02	5.3500	3.8900	0.0000
Xe-135	9.1390	h	0.22	1.2839E+14	7.3108E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1505E+13	6.2714E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6740E+14	5.6227E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1066E+12	1.9631E-02	0.0800	0.7182	0.0081
Br-79m	4.8640	s	0.72	4.2151E+09	1.6234E-02	0.1596	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.7532E+11	1.4115E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.7388E+10	1.2668E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5488E+11	8.0597E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.5714E+10	5.3524E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5531E+11	2.4911E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8536E+10	2.2204E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5166E+11	1.8940E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5538E+11	1.5256E-03	1.7680	1.2360	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 161
Total activity (Ci) = 7.07246E+06

Total number of decays = 5.45333E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 3.43520E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3205
Average beta E (MeV) = 0.49775
Average alpha E (MeV) = 2.19322E-07

Composite Exposure Rate Conversion Factor = 24.4333572 R/hr per Ci/m2
Composite ECF per FGR table = 22.2622147 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.5064888 Rem/hr per Ci/m2

Air Source

Point in time = 2.58945155 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4193E+21	6.8910E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300 s 0.28	2.8074E+16	7.3762E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910 s 0.30	5.8823E+16	4.0950E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200 s 0.76	2.0879E+16	2.9632E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900 m 0.40	2.5974E+17	1.6252E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.7279E+16	6309.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490 s 0.20	5.2760E+14	4036.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670 m 0.04	2.9920E+16	937.3	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9292E+17	833.0	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	1.7066E+15	639.4	0.0408	0.0000	0.0000	0.0000
N-17	4.1700 s 0.10	1.2036E+14	540.7	0.0420	1.7200	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030 s 0.27	1.7158E+14	291.4	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000 s 5.36	7.5404E+14	252.2	0.1160	0.1370	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-38m	0.71500 s 0.42	5.6025E+12	146.8	0.6710	0.0000	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.6143E+14	13.20	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3134E+15	6.170	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360 s 0.29	5.3430E+12	5.766	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0206E+15	4.175	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	8.2895E+13	4.007	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600 m 1.29	1.1997E+13	3.229	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2795E+14	2.613	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.6930E+13	1.355	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3223E+14	1.110	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4162E+14	0.7953	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	1.8314E+15	0.2722	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	8.0314E+14	0.2473	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1497E+13	0.1946	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	6.0179E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.2844E+14	7.3136E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1504E+13	6.2707E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6739E+14	5.6227E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
N-18	0.62200 s 1.45	1.4881E+09	4.4820E-02	5.3500	3.8900	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.1062E+12	1.9625E-02	0.0800	0.7182	0.0081	0.0000
Br-79m	4.8640 s 0.72	3.9162E+09	1.5083E-02	0.1596	0.0000	0.0000	0.0000
Br-82m	6.0900 m 1.15	2.7505E+11	1.4101E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680 m 0.57	4.7147E+10	1.2603E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.5473E+11	8.0517E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	1.5612E+10	5.3177E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5526E+11	2.4909E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.8495E+10	2.2193E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.5162E+11	1.8936E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5535E+11	1.5253E-03	1.7680	1.2360	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 162
Total activity (Ci) = 7.06609E+06

Total number of decays = 6.80317E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 4.28551E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3187
Average beta E (MeV) = 0.49629
Average alpha E (MeV) = 2.08778E-07

Composite Exposure Rate Conversion Factor = 24.4116383 R/hr per Ci/m2
Composite ECF per FGR table = 22.2808151 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.4843082 Rem/hr per Ci/m2

Air Source

Point in time = 3.23397112 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4192E+21	6.8905E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300 s 0.28	2.6369E+16	6.9282E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910 s 0.30	5.7854E+16	4.0276E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200 s 0.76	2.0184E+16	2.8646E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900 m 0.40	2.5935E+17	1.6228E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.7129E+16	6274.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490 s 0.20	4.3963E+14	3363.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670 m 0.04	2.9898E+16	936.6	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9290E+17	832.9	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	1.6914E+15	633.7	0.0408	0.0000	0.0000	0.0000
N-17	4.1700 s 0.10	1.0813E+14	485.8	0.0420	1.7200	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030 s 0.27	1.6477E+14	279.8	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000 s 5.36	7.4805E+14	250.2	0.1160	0.1370	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-38m	0.71500 s 0.42	2.9994E+12	78.59	0.6710	0.0000	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.6112E+14	13.18	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3133E+15	6.170	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360 s 0.29	5.2073E+12	5.619	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0205E+15	4.175	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	8.2800E+13	4.002	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600 m 1.29	1.1920E+13	3.208	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2789E+14	2.612	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.6897E+13	1.353	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3480E+14	1.131	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4160E+14	0.7952	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	1.8465E+15	0.2744	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	8.0912E+14	0.2491	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1494E+13	0.1945	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	6.0176E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.2850E+14	7.3170E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1502E+13	6.2699E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6739E+14	5.6227E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
N-18	0.62200 s 1.45	7.2562E+08	2.1855E-02	5.3500	3.8900	0.0000	0.0000
Br-80	17.600 m 0.28	1.1058E+12	1.9617E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900 m 1.15	2.7471E+11	1.4084E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Br-79m	4.8640 s 0.72	3.5725E+09	1.3760E-02	0.1596	0.0000	0.0000	0.0000
Se-83m	1.1680 m 0.57	4.6847E+10	1.2523E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.5453E+11	8.0417E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	1.5486E+10	5.2747E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5520E+11	2.4907E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.8445E+10	2.2181E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.5157E+11	1.8930E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5532E+11	1.5250E-03	1.7680	1.2360	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 162
Total activity (Ci) = 7.05860E+06

Total number of decays = 8.48733E+17
Asympt number of decays = 1.58748E+24
Percent of decays = 5.34641E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3167
Average beta E (MeV) = 0.49459
Average alpha E (MeV) = 1.96306E-07

Composite Exposure Rate Conversion Factor = 24.3862610 R/hr per Ci/m2
Composite ECF per FGR table = 22.3025932 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.4583569 Rem/hr per Ci/m2

Air Source

Point in time = 4.03891134 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4190E+21	6.8899E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300 s 0.28	2.4384E+16	6.4068E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910 s 0.30	5.6667E+16	3.9449E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200 s 0.76	1.9349E+16	2.7460E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900 m 0.40	2.5887E+17	1.6198E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.6943E+16	6231.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490 s 0.20	3.5006E+14	2678.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670 m 0.04	2.9870E+16	935.7	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9288E+17	832.8	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	1.6727E+15	626.7	0.0408	0.0000	0.0000	0.0000
N-17	4.1700 s 0.10	9.4589E+13	424.9	0.0420	1.7200	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030 s 0.27	1.5664E+14	266.0	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000 s 5.36	7.4063E+14	247.8	0.1160	0.1370	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-38m	0.71500 s 0.42	1.3745E+12	36.01	0.6710	0.0000	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.6072E+14	13.14	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3131E+15	6.170	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360 s 0.29	5.0426E+12	5.442	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0204E+15	4.174	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	8.2681E+13	3.996	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600 m 1.29	1.1825E+13	3.183	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2781E+14	2.610	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.6857E+13	1.350	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3639E+14	1.145	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4158E+14	0.7951	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	1.8653E+15	0.2772	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	8.1653E+14	0.2514	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1490E+13	0.1944	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	6.0172E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.2858E+14	7.3213E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1501E+13	6.2689E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6739E+14	5.6227E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6740E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.1053E+12	1.9608E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900 m 1.15	2.7429E+11	1.4063E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680 m 0.57	4.6476E+10	1.2424E-02	0.9726	1.2730	0.0000	0.0000
Br-79m	4.8640 s 0.72	3.1854E+09	1.2268E-02	0.1596	0.0000	0.0000	0.0000
N-18	0.62200 s 1.45	2.9590E+08	8.9120E-03	5.3500	3.8900	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.5430E+11	8.0292E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	1.5330E+10	5.2214E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5513E+11	2.4903E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.8381E+10	2.2165E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.5152E+11	1.8923E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5527E+11	1.5245E-03	1.7680	1.2360	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 162
Total activity (Ci) = 7.04991E+06

Total number of decays = 1.05883E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 6.66985E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3143
Average beta E (MeV) = 0.49262
Average alpha E (MeV) = 1.81754E-07

Composite Exposure Rate Conversion Factor = 24.3571072 R/hr per Ci/m2
Composite ECF per FGR table = 22.3278141 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.4284687 Rem/hr per Ci/m2

Air Source

Point in time = 5.04420424 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4187E+21	6.8892E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300 s 0.28	2.2114E+16	5.8102E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910 s 0.30	5.5219E+16	3.8441E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200 s 0.76	1.8354E+16	2.6048E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900 m 0.40	2.5827E+17	1.6160E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.6712E+16	6178.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490 s 0.20	2.6337E+14	2015.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670 m 0.04	2.9835E+16	934.6	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9284E+17	832.7	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	1.6495E+15	618.0	0.0408	0.0000	0.0000	0.0000
N-17	4.1700 s 0.10	8.0033E+13	359.5	0.0420	1.7200	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
F-20	11.030 s 0.27	1.4705E+14	249.8	1.6340	2.4810	0.0000	0.0000
Xe-125m	56.000 s 5.36	7.3147E+14	244.7	0.1160	0.1370	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-38m	0.71500 s 0.42	5.1866E+11	13.59	0.6710	0.0000	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.6024E+14	13.10	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3128E+15	6.170	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360 s 0.29	4.8442E+12	5.227	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0202E+15	4.174	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	8.2532E+13	3.989	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600 m 1.29	1.1707E+13	3.151	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2771E+14	2.608	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.6807E+13	1.346	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3721E+14	1.152	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4155E+14	0.7949	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	1.8884E+15	0.2806	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	8.2568E+14	0.2542	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1485E+13	0.1944	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	6.0168E+13	0.1305	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.2867E+14	7.3266E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1498E+13	6.2676E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6739E+14	5.6227E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4810E+15	4.5092E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6741E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.1046E+12	1.9596E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900 m 1.15	2.7377E+11	1.4036E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.6360E+14	1.3762E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680 m 0.57	4.6016E+10	1.2301E-02	0.9726	1.2730	0.0000	0.0000
Br-79m	4.8640 s 0.72	2.7602E+09	1.0631E-02	0.1596	0.0000	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.5400E+11	8.0137E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	1.5137E+10	5.1557E-03	3.3060	1.9440	0.0000	0.0000
N-18	0.62200 s 1.45	9.6519E+07	2.9070E-03	5.3500	3.8900	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5504E+11	2.4899E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.8302E+10	2.2145E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.5145E+11	1.8915E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5522E+11	1.5240E-03	1.7680	1.2360	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 161
Total activity (Ci) = 7.03992E+06

Total number of decays = 1.32087E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 8.32051E-05
Average chain length = 1.0000

Average gamma E (MeV) = 1.3116
Average beta E (MeV) = 0.49041
Average alpha E (MeV) = 1.65066E-07

Composite Exposure Rate Conversion Factor = 24.3243008 R/hr per Ci/m2
Composite ECF per FGR table = 22.3566456 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.3947296 Rem/hr per Ci/m2

Air Source

Point in time = 6.29971647 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4184E+21	6.8883E+06	1.2840	0.4639	0.0000	0.0000
N-16	7.1300	s	0.28	1.9573E+16	5.1426E+04	4.6030	2.6930	0.0000	0.0000
O-19	26.910	s	0.30	5.3461E+16	3.7218E+04	0.9398	1.7770	0.0000	0.0000
Kr-81m	13.200	s	0.76	1.7183E+16	2.4386E+04	0.1310	0.0595	0.0000	0.0000
S-37	4.9900	m	0.40	2.5752E+17	1.6113E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.6426E+16	6112.	4.0690	1.5290	0.0000	0.0000
C-15	2.4490	s	0.20	1.8461E+14	1412.	3.3580	2.9960	0.0000	0.0000
N-13	9.9670	m	0.04	2.9792E+16	933.3	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9281E+17	832.6	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.6211E+15	607.4	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
N-17	4.1700	s	0.10	6.4958E+13	291.8	0.0420	1.7200	0.0000	0.0000
Xe-125m	56.000	s	5.36	7.2019E+14	240.9	0.1160	0.1370	0.0000	0.0000
F-20	11.030	s	0.27	1.3590E+14	230.8	1.6340	2.4810	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.5963E+14	13.05	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3126E+15	6.170	0.1570	0.2282	0.0000	0.0000
Se-77m	17.360	s	0.29	4.6073E+12	4.972	0.0888	0.0000	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0200E+15	4.173	0.7960	1.3380	0.0000	0.0000
Cl-38m	0.71500	s	0.42	1.5356E+11	4.023	0.6710	0.0000	0.0000	0.0000
Br-78	6.4600	m	0.62	8.2347E+13	3.980	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.1561E+13	3.112	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2759E+14	2.605	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.6745E+13	1.341	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3752E+14	1.154	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4151E+14	0.7947	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.9169E+15	0.2849	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	8.3695E+14	0.2577	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1479E+13	0.1943	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0163E+13	0.1304	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2879E+14	7.3333E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1495E+13	6.2660E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6739E+14	5.6227E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6741E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	1.1037E+12	1.9580E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.7312E+11	1.4002E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.5448E+10	1.2149E-02	0.9726	1.2730	0.0000	0.0000
Br-79m	4.8640	s	0.72	2.3080E+09	8.8893E-03	0.1596	0.0000	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5363E+11	7.9944E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.4899E+10	5.0748E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5492E+11	2.4894E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.8203E+10	2.2120E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.5136E+11	1.8904E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.5514E+11	1.5233E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.1077E+12	1.3068E-03	0.0240	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 159
Total activity (Ci) = 7.02862E+06

Total number of decays = 1.64763E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 1.03789E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.3086
Average beta E (MeV) = 0.48795
Average alpha E (MeV) = 1.46334E-07

Composite Exposure Rate Conversion Factor = 24.2882843 R/hr per Ci/m2
Composite ECF per FGR table = 22.3890667 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.3575268 Rem/hr per Ci/m2

Air Source

Point in time = 7.86772490 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4180E+21	6.8871E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	1.6805E+16	4.4156E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	5.1345E+16	3.5745E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	1.5825E+16	2.2459E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.5658E+17	1.6055E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.6074E+16	6030.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.9738E+16	931.6	1.0200	0.0000	0.4909
C-15	2.4490	s	0.20	1.1844E+14	906.0	3.3580	2.9960	0.0000
Kr-83m	1.8300	h	1.09	2.9276E+17	832.5	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.5862E+15	594.3	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
Xe-125m	56.000	s	5.36	7.0635E+14	236.3	0.1160	0.1370	0.0000
N-17	4.1700	s	0.10	5.0054E+13	224.9	0.0420	1.7200	0.0000
F-20	11.030	s	0.27	1.2314E+14	209.2	1.6340	2.4810	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-137	3.8180	m	0.34	1.5887E+14	12.99	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3122E+15	6.169	0.1570	0.2282	0.0000
Se-77m	17.360	s	0.29	4.3277E+12	4.670	0.0888	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0198E+15	4.172	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.2116E+13	3.969	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.1382E+13	3.064	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2744E+14	2.602	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.6667E+13	1.334	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3757E+14	1.155	1.5110	1.5200	0.0000
Cl-38m	0.71500	s	0.42	3.3583E+10	0.8799	0.6710	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4147E+14	0.7944	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	1.9517E+15	0.2900	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	8.5077E+14	0.2620	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1472E+13	0.1941	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0156E+13	0.1304	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2893E+14	7.3416E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1492E+13	6.2641E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6738E+14	5.6226E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6741E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1027E+12	1.9562E-02	0.0800	0.7182	0.0081
Br-82m	6.0900	m	1.15	2.7231E+11	1.3961E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6360E+14	1.3761E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.4749E+10	1.1962E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5316E+11	7.9703E-03	2.7620	0.9100	0.0000
Br-79m	4.8640	s	0.72	1.8458E+09	7.1093E-03	0.1596	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.4607E+10	4.9755E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5478E+11	2.4887E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.8080E+10	2.2089E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5125E+11	1.8890E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5506E+11	1.5224E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1076E+12	1.3067E-03	0.0240	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 7.01605E+06

Total number of decays = 2.05503E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 1.29452E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.3054
Average beta E (MeV) = 0.48531
Average alpha E (MeV) = 1.25870E-07

Composite Exposure Rate Conversion Factor = 24.2499237 R/hr per Ci/m2
Composite ECF per FGR table = 22.4248123 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.3176804 Rem/hr per Ci/m2

Air Source

Point in time = 9.82601738 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4175E+21	6.8857E+06	1.2840	0.4639	0.0000
N-16	7.1300	s	0.28	1.3892E+16	3.6501E+04	4.6030	2.6930	0.0000
O-19	26.910	s	0.30	4.8819E+16	3.3986E+04	0.9398	1.7770	0.0000
Kr-81m	13.200	s	0.76	1.4278E+16	2.0264E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.5542E+17	1.5982E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.5641E+16	5930.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.9670E+16	929.5	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9270E+17	832.3	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.5437E+15	578.4	0.0408	0.0000	0.0000
C-15	2.4490	s	0.20	6.8044E+13	520.5	3.3580	2.9960	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
Xe-125m	56.000	s	5.36	6.8944E+14	230.6	0.1160	0.1370	0.0000
F-20	11.030	s	0.27	1.0888E+14	184.9	1.6340	2.4810	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
N-17	4.1700	s	0.10	3.6147E+13	162.4	0.0420	1.7200	0.0000
Xe-137	3.8180	m	0.34	1.5793E+14	12.92	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3118E+15	6.169	0.1570	0.2282	0.0000
Se-77m	17.360	s	0.29	4.0022E+12	4.319	0.0888	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0195E+15	4.171	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.1829E+13	3.955	0.1120	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.1162E+13	3.005	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2725E+14	2.599	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.6571E+13	1.327	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3752E+14	1.154	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4141E+14	0.7941	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	1.9942E+15	0.2964	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	8.6767E+14	0.2672	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1462E+13	0.1940	0.0080	0.6107	0.0000
Cl-38m	0.71500	s	0.42	5.0308E+09	0.1318	0.6710	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0147E+13	0.1304	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2912E+14	7.3519E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1487E+13	6.2616E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6738E+14	5.6226E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6741E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.1014E+12	1.9538E-02	0.0800	0.7182	0.0081
Br-82m	6.0900	m	1.15	2.7130E+11	1.3909E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6359E+14	1.3761E-02	0.0513	0.1830	0.0000
Se-83m	1.1680	m	0.57	4.3890E+10	1.1733E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5259E+11	7.9403E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-79m	4.8640	s	0.72	1.3964E+09	5.3781E-03	0.1596	0.0000	0.0000
Br-86	55.000	s	1.46	1.4251E+10	4.8542E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5460E+11	2.4879E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.7927E+10	2.2051E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5111E+11	1.8873E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5495E+11	1.5213E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1075E+12	1.3066E-03	0.0240	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 7.00235E+06

Total number of decays = 2.56289E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 1.61443E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.3021
Average beta E (MeV) = 0.48254
Average alpha E (MeV) = 1.04254E-07

Composite Exposure Rate Conversion Factor = 24.2105713 R/hr per Ci/m2
Composite ECF per FGR table = 22.4633007 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.2764816 Rem/hr per Ci/m2

Air Source

Point in time = 12.2717333 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4169E+21	6.8839E+06	1.2840	0.4639	0.0000
O-19	26.910	s	0.30	4.5839E+16	3.1911E+04	0.9398	1.7770	0.0000
N-16	7.1300	s	0.28	1.0952E+16	2.8777E+04	4.6030	2.6930	0.0000
Kr-81m	13.200	s	0.76	1.2557E+16	1.7822E+04	0.1310	0.0595	0.0000
S-37	4.9900	m	0.40	2.5398E+17	1.5892E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	2.5110E+16	5807.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.9586E+16	926.8	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9262E+17	832.1	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.4923E+15	559.1	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
C-15	2.4490	s	0.20	3.4054E+13	260.5	3.3580	2.9960	0.0000
Xe-125m	56.000	s	5.36	6.6888E+14	223.8	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
F-20	11.030	s	0.27	9.3372E+13	158.6	1.6340	2.4810	0.0000
N-17	4.1700	s	0.10	2.4072E+13	108.1	0.0420	1.7200	0.0000
Xe-137	3.8180	m	0.34	1.5677E+14	12.82	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3112E+15	6.168	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0191E+15	4.169	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	8.1472E+13	3.938	0.1120	0.0000	0.0000
Se-77m	17.360	s	0.29	3.6299E+12	3.917	0.0888	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.0894E+13	2.932	0.1680	0.1290	0.0000
Xe-135m	15.290	m	0.33	1.2702E+14	2.594	0.4320	0.0984	0.0000
Se-79m	3.9000	m	0.51	1.6451E+13	1.317	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3742E+14	1.153	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4134E+14	0.7937	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	2.0456E+15	0.3040	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	8.8820E+14	0.2735	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1450E+13	0.1938	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0137E+13	0.1304	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.2934E+14	7.3649E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1482E+13	6.2585E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6737E+14	5.6225E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6741E+14	2.3461E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.0997E+12	1.9509E-02	0.0800	0.7182	0.0081
Br-82m	6.0900	m	1.15	2.7004E+11	1.3845E-02	0.0028	0.0306	0.0000
Xe-129m	8.8800	d	0.23	5.6359E+14	1.3761E-02	0.0513	0.1830	0.0000
Cl-38m	0.71500	s	0.42	4.6983E+08	1.2310E-02	0.6710	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.2841E+10	1.1452E-02	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.5187E+11	7.9030E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.3819E+10	4.7068E-03	3.3060	1.9440	0.0000
Br-79m	4.8640	s	0.72	9.8545E+08	3.7955E-03	0.1596	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5437E+11	2.4869E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.7735E+10	2.2003E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.5094E+11	1.8852E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5481E+11	1.5200E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1074E+12	1.3064E-03	0.0240	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 6.98775E+06

Total number of decays = 3.19586E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 2.01316E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2989
Average beta E (MeV) = 0.47973
Average alpha E (MeV) = 8.23643E-08

Composite Exposure Rate Conversion Factor = 24.1720333 R/hr per Ci/m2
Composite ECF per FGR table = 22.5035992 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.2357330 Rem/hr per Ci/m2

Air Source

Point in time = 15.3261919 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4161E+21	6.8817E+06	1.2840	0.4639	0.0000	0.0000
O-19	26.910	s	0.30	4.2371E+16	2.9497E+04	0.9398	1.7770	0.0000	0.0000
N-16	7.1300	s	0.28	8.1387E+15	2.1384E+04	4.6030	2.6930	0.0000	0.0000
S-37	4.9900	m	0.40	2.5219E+17	1.5780E+04	2.9310	0.7998	0.0000	0.0000
Kr-81m	13.200	s	0.76	1.0697E+16	1.5181E+04	0.1310	0.0595	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.4462E+16	5658.	4.0690	1.5290	0.0000	0.0000
N-13	9.9670	m	0.04	2.9482E+16	923.5	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9253E+17	831.8	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.4304E+15	535.9	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	6.4406E+14	215.5	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
F-20	11.030	s	0.27	7.7065E+13	130.9	1.6340	2.4810	0.0000	0.0000
C-15	2.4490	s	0.20	1.4345E+13	109.7	3.3580	2.9960	0.0000	0.0000
N-17	4.1700	s	0.10	1.4488E+13	65.09	0.0420	1.7200	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.5533E+14	12.70	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3105E+15	6.167	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0186E+15	4.167	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.1028E+13	3.916	0.1120	0.0000	0.0000	0.0000
Se-77m	17.360	s	0.29	3.2131E+12	3.467	0.0888	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.0567E+13	2.844	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2672E+14	2.588	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.6303E+13	1.305	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3729E+14	1.152	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4125E+14	0.7932	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.1074E+15	0.3132	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	9.1299E+14	0.2811	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1435E+13	0.1935	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0123E+13	0.1304	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2963E+14	7.3810E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1474E+13	6.2546E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6737E+14	5.6225E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6742E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	1.0976E+12	1.9473E-02	0.0800	0.7182	0.0081	0.0000
Br-82m	6.0900	m	1.15	2.6848E+11	1.3765E-02	0.0028	0.0306	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6359E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.1566E+10	1.1111E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.5098E+11	7.8566E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.3297E+10	4.5291E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5409E+11	2.4857E-03	0.0631	0.5420	0.0000	0.0000
Br-79m	4.8640	s	0.72	6.3767E+08	2.4560E-03	0.1596	0.0000	0.0000	0.0000
Te-133	12.450	m	2.41	8.7497E+10	2.1943E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.5073E+11	1.8825E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.5464E+11	1.5183E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.1073E+12	1.3063E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.7987E+10	6.7189E-04	2.4290	0.4976	0.0000	0.0000

Check of numerical solution:

Initial number of atoms	=	1.587482606228206D+24
Current number of atoms	=	1.587482606228208D+24

Total number of nuclides	=	159
Total activity (Ci)	=	6.97257E+06

Total number of decays	=	3.98469E+18
Asympt number of decays	=	1.58748E+24
Percent of decays	=	2.51007E-04
Average chain length	=	1.0000

Average gamma E (MeV)	=	1.2958
Average beta E (MeV)	=	0.47700
Average alpha E (MeV)	=	6.13372E-08

Composite Exposure Rate Conversion Factor	=	24.1364841	R/hr per Ci/m2
Composite ECF per FGR table	=	22.5444450	R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor	=	16.1976089	Rem/hr per Ci/m2

Air Source

Point in time = 19.1409130 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4151E+21	6.8789E+06	1.2840	0.4639	0.0000	0.0000
O-19	26.910	s	0.30	3.8405E+16	2.6736E+04	0.9398	1.7770	0.0000	0.0000
S-37	4.9900	m	0.40	2.4997E+17	1.5641E+04	2.9310	0.7998	0.0000	0.0000
N-16	7.1300	s	0.28	5.6169E+15	1.4758E+04	4.6030	2.6930	0.0000	0.0000
Kr-81m	13.200	s	0.76	8.7548E+15	1.2425E+04	0.1310	0.0595	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.3676E+16	5476.	4.0690	1.5290	0.0000	0.0000
N-13	9.9670	m	0.04	2.9352E+16	919.5	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9241E+17	831.5	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.3567E+15	508.3	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000	s	5.36	6.1436E+14	205.5	0.1160	0.1370	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
F-20	11.030	s	0.27	6.0638E+13	103.0	1.6340	2.4810	0.0000	0.0000
C-15	2.4490	s	0.20	4.8732E+12	37.28	3.3580	2.9960	0.0000	0.0000
N-17	4.1700	s	0.10	7.6848E+12	34.52	0.0420	1.7200	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.5354E+14	12.56	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.3096E+15	6.166	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0180E+15	4.165	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	8.0478E+13	3.890	0.1120	0.0000	0.0000	0.0000
Se-77m	17.360	s	0.29	2.7592E+12	2.977	0.0888	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.0174E+13	2.738	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2636E+14	2.580	0.4320	0.0984	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.6120E+13	1.291	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3712E+14	1.151	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.4114E+14	0.7926	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.1811E+15	0.3241	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	9.4265E+14	0.2903	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1417E+13	0.1932	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	6.0106E+13	0.1303	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.2998E+14	7.4010E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1466E+13	6.2498E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6736E+14	5.6224E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6742E+14	2.3461E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	1.0951E+12	1.9427E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6359E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.6654E+11	1.3665E-02	0.0028	0.0306	0.0000	0.0000
Se-83m	1.1680	m	0.57	4.0027E+10	1.0700E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.4987E+11	7.7991E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000	s	1.46	1.2673E+10	4.3165E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600	h	0.29	5.5374E+11	2.4841E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	8.7200E+10	2.1868E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.5047E+11	1.8792E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.5442E+11	1.5162E-03	1.7680	1.2360	0.0000	0.0000
Br-79m	4.8640	s	0.72	3.7026E+08	1.4260E-03	0.1596	0.0000	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.1071E+12	1.3061E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.7893E+10	6.7056E-04	2.4290	0.4976	0.0000	0.0000

Check of numerical solution:

Initial number of atoms	=	1.587482606228206D+24
Current number of atoms	=	1.587482606228205D+24

Total number of nuclides	=	159
Total activity (Ci)	=	6.95717E+06

Total number of decays	=	4.96771E+18
Asympt number of decays	=	1.58748E+24
Percent of decays	=	3.12930E-04
Average chain length	=	1.0000

Average gamma E (MeV)	=	1.2932
Average beta E (MeV)	=	0.47447
Average alpha E (MeV)	=	4.24254E-08

Composite Exposure Rate Conversion Factor	=	24.1061497	R/hr per Ci/m2
Composite ECF per FGR table	=	22.5843315	R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor	=	16.1643887	Rem/hr per Ci/m2

Air Source

Point in time = 23.9051113 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4139E+21	6.8755E+06	1.2840	0.4639	0.0000	0.0000
O-19	26.910 s 0.30	3.3970E+16	2.3649E+04	0.9398	1.7770	0.0000	0.0000
S-37	4.9900 m 0.40	2.4723E+17	1.5469E+04	2.9310	0.7998	0.0000	0.0000
Kr-81m	13.200 s 0.76	6.8171E+15	9675.	0.1310	0.0595	0.0000	0.0000
N-16	7.1300 s 0.28	3.5347E+15	9287.	4.6030	2.6930	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.2730E+16	5257.	4.0690	1.5290	0.0000	0.0000
N-13	9.9670 m 0.04	2.9190E+16	914.4	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9226E+17	831.1	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	1.2700E+15	475.8	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000	0.0000
Xe-125m	56.000 s 5.36	5.7918E+14	193.8	0.1160	0.1370	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
F-20	11.030 s 0.27	4.4949E+13	76.34	1.6340	2.4810	0.0000	0.0000
N-17	4.1700 s 0.10	3.4810E+12	15.64	0.0420	1.7200	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.5135E+14	12.38	0.1960	1.7030	0.0000	0.0000
C-15	2.4490 s 0.20	1.2653E+12	9.679	3.3580	2.9960	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3085E+15	6.165	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0173E+15	4.162	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	7.9795E+13	3.857	0.1120	0.0000	0.0000	0.0000
Xe-127m	1.1600 m 1.29	9.7021E+12	2.611	0.1680	0.1290	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2591E+14	2.571	0.4320	0.0984	0.0000	0.0000
Se-77m	17.360 s 0.29	2.2812E+12	2.462	0.0888	0.0000	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.5894E+13	1.272	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3692E+14	1.149	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4100E+14	0.7918	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	2.2677E+15	0.3370	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	9.7778E+14	0.3011	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1394E+13	0.1928	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	6.0085E+13	0.1303	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.3042E+14	7.4260E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1455E+13	6.2438E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6735E+14	5.6223E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6743E+14	2.3462E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.0919E+12	1.9371E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800 d 0.23	5.6359E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900 m 1.15	2.6415E+11	1.3543E-02	0.0028	0.0306	0.0000	0.0000
Se-83m	1.1680 m 0.57	3.8185E+10	1.0208E-02	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.4850E+11	7.7279E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	1.1934E+10	4.0650E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5330E+11	2.4821E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.6830E+10	2.1776E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.5014E+11	1.8751E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5416E+11	1.5136E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110 h 0.23	1.1068E+12	1.3058E-03	0.0240	0.0000	0.0000	0.0000
Br-79m	4.8640 s 0.72	1.8778E+08	7.2324E-04	0.1596	0.0000	0.0000	0.0000
Se-83	22.300 m 1.35	4.7775E+10	6.6891E-04	2.4290	0.4976	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 159
Total activity (Ci) = 6.94189E+06

Total number of decays = 6.19269E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 3.90095E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2910
Average beta E (MeV) = 0.47226
Average alpha E (MeV) = 2.67569E-08

Composite Exposure Rate Conversion Factor = 24.0828400 R/hr per Ci/m2
Composite ECF per FGR table = 22.6217194 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1379852 Rem/hr per Ci/m2

Air Source

Point in time = 29.8551559 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4124E+21	6.8712E+06	1.2840	0.4639	0.0000
O-19	26.910	s	0.30	2.9143E+16	2.0288E+04	0.9398	1.7770	0.0000
S-37	4.9900	m	0.40	2.4385E+17	1.5258E+04	2.9310	0.7998	0.0000
Kr-81m	13.200	s	0.76	4.9878E+15	7079.	0.1310	0.0595	0.0000
N-16	7.1300	s	0.28	1.9822E+15	5208.	4.6030	2.6930	0.0000
Cl-40	1.3500	m	1.48	2.1602E+16	4996.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.8989E+16	908.1	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9208E+17	830.6	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.1695E+15	438.2	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
Xe-125m	56.000	s	5.36	5.3806E+14	180.0	0.1160	0.1370	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
F-20	11.030	s	0.27	3.0927E+13	52.53	1.6340	2.4810	0.0000
Xe-137	3.8180	m	0.34	1.4865E+14	12.16	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3072E+15	6.163	0.1570	0.2282	0.0000
N-17	4.1700	s	0.10	1.2947E+12	5.817	0.0420	1.7200	0.0000
Kr-87	1.2720	h	0.79	1.0164E+15	4.158	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	7.8950E+13	3.816	0.1120	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2534E+14	2.560	0.4320	0.0984	0.0000
Xe-127m	1.1600	m	1.29	9.1439E+12	2.461	0.1680	0.1290	0.0000
Se-77m	17.360	s	0.29	1.7988E+12	1.941	0.0888	0.0000	0.0000
C-15	2.4490	s	0.20	2.3487E+11	1.797	3.3580	2.9960	0.0000
Se-79m	3.9000	m	0.51	1.5616E+13	1.250	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3667E+14	1.147	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4082E+14	0.7908	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	2.3682E+15	0.3519	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.0188E+15	0.3137	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1365E+13	0.1923	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0059E+13	0.1302	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.3096E+14	7.4570E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1441E+13	6.2363E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6734E+14	5.6222E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4810E+15	4.5091E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6744E+14	2.3462E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.0879E+12	1.9300E-02	0.0800	0.7182	0.0081
Xe-129m	8.8800	d	0.23	5.6358E+14	1.3761E-02	0.0513	0.1830	0.0000
Br-82m	6.0900	m	1.15	2.6118E+11	1.3391E-02	0.0028	0.0306	0.0000
Se-83m	1.1680	m	0.57	3.6003E+10	9.6241E-03	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.4681E+11	7.6399E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.1072E+10	3.7713E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5276E+11	2.4797E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.6371E+10	2.1661E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.4973E+11	1.8700E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5382E+11	1.5103E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1066E+12	1.3054E-03	0.0240	0.0000	0.0000
Se-83	22.300	m	1.35	4.7628E+10	6.6685E-04	2.4290	0.4976	0.0000
Te-133m	55.400	m	0.72	8.8150E+10	4.9680E-04	1.6960	0.6000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 159
Total activity (Ci) = 6.92697E+06

Total number of decays = 7.71924E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 4.86257E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2896
Average beta E (MeV) = 0.47042
Average alpha E (MeV) = 1.50369E-08

Composite Exposure Rate Conversion Factor = 24.0673981 R/hr per Ci/m2
Composite ECF per FGR table = 22.6553345 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1193924 Rem/hr per Ci/m2

Air Source

Point in time = 37.2861481 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4105E+21	6.8658E+06	1.2840	0.4639	0.0000
O-19	26.910	s	0.30	2.4066E+16	1.6754E+04	0.9398	1.7770	0.0000
S-37	4.9900	m	0.40	2.3969E+17	1.4998E+04	2.9310	0.7998	0.0000
Kr-81m	13.200	s	0.76	3.3763E+15	4792.	0.1310	0.0595	0.0000
Cl-40	1.3500	m	1.48	2.0271E+16	4688.	4.0690	1.5290	0.0000
N-16	7.1300	s	0.28	9.6250E+14	2529.	4.6030	2.6930	0.0000
N-13	9.9670	m	0.04	2.8741E+16	900.3	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9185E+17	829.9	0.0026	0.0382	0.0000
Kr-79m	50.000	s	6.00	1.0550E+15	395.3	0.0408	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5020E+19	340.6	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-125m	56.000	s	5.36	4.9077E+14	164.2	0.1160	0.1370	0.0000
F-20	11.030	s	0.27	1.9388E+13	32.93	1.6340	2.4810	0.0000
Xe-137	3.8180	m	0.34	1.4534E+14	11.89	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.3055E+15	6.161	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0153E+15	4.153	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	7.7908E+13	3.765	0.1120	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2464E+14	2.545	0.4320	0.0984	0.0000
Xe-127m	1.1600	m	1.29	8.4916E+12	2.286	0.1680	0.1290	0.0000
N-17	4.1700	s	0.10	3.7648E+11	1.691	0.0420	1.7200	0.0000
Se-77m	17.360	s	0.29	1.3370E+12	1.443	0.0888	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.5276E+13	1.223	0.0139	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3635E+14	1.144	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.4061E+14	0.7896	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	2.4826E+15	0.3689	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.0660E+15	0.3282	0.2690	0.0323	0.0013
C-15	2.4490	s	0.20	2.8669E+10	0.2193	3.3580	2.9960	0.0000
S-35	87.310	d	0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1330E+13	0.1917	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	6.0026E+13	0.1302	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.3164E+14	7.4955E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1424E+13	6.2270E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6732E+14	5.6220E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4809E+15	4.5091E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6745E+14	2.3462E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.0830E+12	1.9213E-02	0.0800	0.7182	0.0081
Xe-129m	8.8800	d	0.23	5.6358E+14	1.3761E-02	0.0513	0.1830	0.0000
Br-82m	6.0900	m	1.15	2.5753E+11	1.3203E-02	0.0028	0.0306	0.0000
Se-83m	1.1680	m	0.57	3.3451E+10	8.9422E-03	0.9726	1.2730	0.0000
Br-84m	6.0000	m	3.33	1.4473E+11	7.5314E-03	2.7620	0.9100	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-86	55.000	s	1.46	1.0082E+10	3.4341E-03	3.3060	1.9440	0.0000
Te-129	1.1600	h	0.29	5.5208E+11	2.4766E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.5802E+10	2.1518E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.4921E+11	1.8636E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.5341E+11	1.5062E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1062E+12	1.3050E-03	0.0240	0.0000	0.0000
Se-83	22.300	m	1.35	4.7445E+10	6.6429E-04	2.4290	0.4976	0.0000
Te-133m	55.400	m	0.72	8.8013E+10	4.9603E-04	1.6960	0.6000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 6.91243E+06

Total number of decays = 9.62171E+18
Asympt number of decays = 1.58748E+24
Percent of decays = 6.06099E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2887
Average beta E (MeV) = 0.46897
Average alpha E (MeV) = 7.31699E-09

Composite Exposure Rate Conversion Factor = 24.0592327 R/hr per Ci/m2
Composite ECF per FGR table = 22.6844215 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1082287 Rem/hr per Ci/m2

Air Source

Point in time = 46.5667229 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4082E+21	6.8591E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900 m 0.40	2.3460E+17	1.4679E+04	2.9310	0.7998	0.0000	0.0000
O-19	26.910 s 0.30	1.8949E+16	1.3192E+04	0.9398	1.7770	0.0000	0.0000
Cl-40	1.3500 m 1.48	1.8723E+16	4330.	4.0690	1.5290	0.0000	0.0000
Kr-81m	13.200 s 0.76	2.0739E+15	2943.	0.1310	0.0595	0.0000	0.0000
N-16	7.1300 s 0.28	3.9046E+14	1026.	4.6030	2.6930	0.0000	0.0000
N-13	9.9670 m 0.04	2.8433E+16	890.7	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9157E+17	829.1	0.0026	0.0382	0.0000	0.0000
Kr-79m	50.000 s 6.00	9.2762E+14	347.6	0.0408	0.0000	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5019E+19	340.6	0.0002	0.0019	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-125m	56.000 s 5.36	4.3752E+14	146.4	0.1160	0.1370	0.0000	0.0000
F-20	11.030 s 0.27	1.0820E+13	18.38	1.6340	2.4810	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.4132E+14	11.56	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3034E+15	6.159	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0138E+15	4.148	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	7.6626E+13	3.704	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2377E+14	2.527	0.4320	0.0984	0.0000	0.0000
Xe-127m	1.1600 m 1.29	7.7419E+12	2.084	0.1680	0.1290	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.4862E+13	1.190	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3596E+14	1.141	1.5110	1.5200	0.0000	0.0000
Se-77m	17.360 s 0.29	9.2300E+11	0.9960	0.0888	0.0000	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4034E+14	0.7881	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	2.6098E+15	0.3879	0.2570	0.0053	0.0183	0.0000
N-17	4.1700 s 0.10	8.0497E+10	0.3616	0.0420	1.7200	0.0000	0.0000
Xe-125	16.900 h 1.18	1.1192E+15	0.3446	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1285E+13	0.1910	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	5.9985E+13	0.1301	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.3248E+14	7.5434E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1402E+13	6.2154E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6730E+14	5.6218E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4809E+15	4.5090E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6746E+14	2.3463E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.0769E+12	1.9104E-02	0.0800	0.7182	0.0081	0.0000
C-15	2.4490 s 0.20	2.0732E+09	1.5859E-02	3.3580	2.9960	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.6358E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900 m 1.15	2.5303E+11	1.2973E-02	0.0028	0.0306	0.0000	0.0000
Se-83m	1.1680 m 0.57	3.0517E+10	8.1579E-03	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.4216E+11	7.3980E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	8.9694E+09	3.0551E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5123E+11	2.4728E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.5096E+10	2.1341E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.4858E+11	1.8556E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5289E+11	1.5012E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110 h 0.23	1.1058E+12	1.3045E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300 m 1.35	4.7217E+10	6.6110E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400 m 0.72	8.7843E+10	4.9507E-04	1.6960	0.6000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 159
Total activity (Ci) = 6.89804E+06

Total number of decays = 1.19928E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 7.55457E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2882
Average beta E (MeV) = 0.46785
Average alpha E (MeV) = 2.97447E-09

Composite Exposure Rate Conversion Factor = 24.0564308 R/hr per Ci/m2
Composite ECF per FGR table = 22.7088852 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1027832 Rem/hr per Ci/m2

Air Source

Point in time = 58.1572990 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.4052E+21	6.8507E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900 m 0.40	2.2838E+17	1.4290E+04	2.9310	0.7998	0.0000	0.0000
O-19	26.910 s 0.30	1.4058E+16	9787.	0.9398	1.7770	0.0000	0.0000
Cl-40	1.3500 m 1.48	1.6956E+16	3921.	4.0690	1.5290	0.0000	0.0000
Kr-81m	13.200 s 0.76	1.1284E+15	1601.	0.1310	0.0595	0.0000	0.0000
N-13	9.9670 m 0.04	2.8054E+16	878.8	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300 h 1.09	2.9121E+17	828.1	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030 d 0.09	5.5019E+19	340.6	0.0002	0.0019	0.0000	0.0000
N-16	7.1300 s 0.28	1.2654E+14	332.5	4.6030	2.6930	0.0000	0.0000
Kr-79m	50.000 s 6.00	7.8993E+14	296.0	0.0408	0.0000	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-125m	56.000 s 5.36	3.7904E+14	126.8	0.1160	0.1370	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.3645E+14	11.16	0.1960	1.7030	0.0000	0.0000
F-20	11.030 s 0.27	5.2229E+12	8.871	1.6340	2.4810	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.3007E+15	6.156	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.0121E+15	4.140	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600 m 0.62	7.5054E+13	3.628	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.2269E+14	2.505	0.4320	0.0984	0.0000	0.0000
Xe-127m	1.1600 m 1.29	6.8979E+12	1.857	0.1680	0.1290	0.0000	0.0000
Se-79m	3.9000 m 0.51	1.4360E+13	1.150	0.0139	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.3547E+14	1.137	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.4000E+14	0.7862	1.4500	0.8276	0.0000	0.0000
Se-77m	17.360 s 0.29	5.8105E+11	0.6270	0.0888	0.0000	0.0000	0.0000
Kr-79	1.4590 d 0.29	2.7473E+15	0.4083	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	1.1775E+15	0.3626	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.4180E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	1.1230E+13	0.1900	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	5.9932E+13	0.1299	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.3352E+14	7.6026E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.1376E+13	6.2008E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6728E+14	5.6216E-02	0.0414	0.1920	0.0000	0.0000
N-17	4.1700 s 0.10	1.1724E+10	5.2668E-02	0.0420	1.7200	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4809E+15	4.5090E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6747E+14	2.3463E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600 m 0.28	1.0693E+12	1.8969E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800 d 0.23	5.6357E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900 m 1.15	2.4753E+11	1.2691E-02	0.0028	0.0306	0.0000	0.0000
Se-83m	1.1680 m 0.57	2.7212E+10	7.2743E-03	0.9726	1.2730	0.0000	0.0000
Br-84m	6.0000 m 3.33	1.3903E+11	7.2347E-03	2.7620	0.9100	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-86	55.000 s 1.46	7.7504E+09	2.6399E-03	3.3060	1.9440	0.0000	0.0000
Te-129	1.1600 h 0.29	5.5017E+11	2.4681E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450 m 2.41	8.4222E+10	2.1122E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000 m 0.40	1.4779E+11	1.8457E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800 m 0.25	1.5225E+11	1.4949E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110 h 0.23	1.1052E+12	1.3038E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300 m 1.35	4.6934E+10	6.5714E-04	2.4290	0.4976	0.0000	0.0000
C-15	2.4490 s 0.20	7.7971E+07	5.9644E-04	3.3580	2.9960	0.0000	0.0000
Te-133m	55.400 m 0.72	8.7631E+10	4.9388E-04	1.6960	0.6000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 159
Total activity (Ci) = 6.88333E+06

Total number of decays = 1.49477E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 9.41600E-04
Average chain length = 1.0000

Average gamma E (MeV) = 1.2880
Average beta E (MeV) = 0.46698
Average alpha E (MeV) = 9.66007E-10

Composite Exposure Rate Conversion Factor = 24.0563412 R/hr per Ci/m2
Composite ECF per FGR table = 22.7291317 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.1005898 Rem/hr per Ci/m2

Air Source

Point in time = 1.21054566 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.4015E+21	6.8403E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	2.2086E+17	1.3819E+04	2.9310	0.7998	0.0000	0.0000
O-19	26.910	s	0.30	9.6828E+15	6741.	0.9398	1.7770	0.0000	0.0000
Cl-40	1.3500	m	1.48	1.4980E+16	3465.	4.0690	1.5290	0.0000	0.0000
N-13	9.9670	m	0.04	2.7587E+16	864.2	1.0200	0.0000	0.4909	0.0000
Kr-83m	1.8300	h	1.09	2.9077E+17	826.8	0.0026	0.0382	0.0000	0.0000
Kr-81m	13.200	s	0.76	5.2765E+14	748.9	0.1310	0.0595	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5019E+19	340.6	0.0002	0.0019	0.0000	0.0000
Kr-79m	50.000	s	6.00	6.4630E+14	242.2	0.0408	0.0000	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Xe-125m	56.000	s	5.36	3.1687E+14	106.0	0.1160	0.1370	0.0000	0.0000
N-16	7.1300	s	0.28	3.0978E+13	81.39	4.6030	2.6930	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.3060E+14	10.68	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2974E+15	6.152	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.0098E+15	4.131	0.7960	1.3380	0.0000	0.0000
F-20	11.030	s	0.27	2.1030E+12	3.572	1.6340	2.4810	0.0000	0.0000
Br-78	6.4600	m	0.62	7.3136E+13	3.535	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2135E+14	2.478	0.4320	0.0984	0.0000	0.0000
Xe-127m	1.1600	m	1.29	5.9719E+12	1.607	0.1680	0.1290	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3487E+14	1.132	1.5110	1.5200	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.3758E+13	1.101	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3958E+14	0.7838	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.8907E+15	0.4296	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.2395E+15	0.3817	0.2690	0.0323	0.0013	0.0000
Se-77m	17.360	s	0.29	3.2599E+11	0.3518	0.0888	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	8.4179E+16	0.2091	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.1162E+13	0.1889	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.9867E+13	0.1298	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.3480E+14	7.6758E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1343E+13	6.1828E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6725E+14	5.6213E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4809E+15	4.5089E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6749E+14	2.3464E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	1.0598E+12	1.8802E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6356E+14	1.3761E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.4082E+11	1.2347E-02	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.3521E+11	7.0358E-03	2.7620	0.9100	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Se-83m	1.1680	m	0.57	2.3582E+10	6.3039E-03	0.9726	1.2730	0.0000	0.0000
N-17	4.1700	s	0.10	1.0570E+09	4.7487E-03	0.0420	1.7200	0.0000	0.0000
Te-129	1.1600	h	0.29	5.4885E+11	2.4622E-03	0.0631	0.5420	0.0000	0.0000
Br-86	55.000	s	1.46	6.4580E+09	2.1997E-03	3.3060	1.9440	0.0000	0.0000
Te-133	12.450	m	2.41	8.3145E+10	2.0851E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.4680E+11	1.8335E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.5145E+11	1.4870E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.1045E+12	1.3030E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.6584E+10	6.5223E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	8.7367E+10	4.9239E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	3.3380E+10	4.1722E-04	0.0915	0.7380	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 6.86771E+06

Total number of decays = 1.86301E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 1.17356E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2879
Average beta E (MeV) = 0.46629
Average alpha E (MeV) = 2.37034E-10

Composite Exposure Rate Conversion Factor = 24.0565872 R/hr per Ci/m2
Composite ECF per FGR table = 22.7457638 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0993328 Rem/hr per Ci/m2

Air Source

Point in time = 1.51185203 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3970E+21	6.8273E+06	1.2840	0.4639	0.0000
S-37	4.9900	m	0.40	2.1180E+17	1.3253E+04	2.9310	0.7998	0.0000
O-19	26.910	s	0.30	6.0781E+15	4231.	0.9398	1.7770	0.0000
Cl-40	1.3500	m	1.48	1.2833E+16	2968.	4.0690	1.5290	0.0000
N-13	9.9670	m	0.04	2.7015E+16	846.3	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.9022E+17	825.3	0.0026	0.0382	0.0000
Ar-37	35.030	d	0.09	5.5019E+19	340.6	0.0002	0.0019	0.0000
Kr-81m	13.200	s	0.76	2.0421E+14	289.8	0.1310	0.0595	0.0000
Kr-79m	50.000	s	6.00	5.0303E+14	188.5	0.0408	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Xe-125m	56.000	s	5.36	2.5333E+14	84.75	0.1160	0.1370	0.0000
N-16	7.1300	s	0.28	5.3430E+12	14.04	4.6030	2.6930	0.0000
Xe-137	3.8180	m	0.34	1.2365E+14	10.11	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.2933E+15	6.147	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0071E+15	4.120	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	7.0809E+13	3.422	0.1120	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.1971E+14	2.444	0.4320	0.0984	0.0000
Xe-127m	1.1600	m	1.29	4.9879E+12	1.343	0.1680	0.1290	0.0000
F-20	11.030	s	0.27	6.7523E+11	1.147	1.6340	2.4810	0.0000
Cl-38	37.200	m	0.27	1.3411E+14	1.126	1.5110	1.5200	0.0000
Se-79m	3.9000	m	0.51	1.3040E+13	1.044	0.0139	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3905E+14	0.7809	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	3.0337E+15	0.4508	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.3027E+15	0.4011	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4179E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.1077E+13	0.1875	0.0080	0.6107	0.0000
Se-77m	17.360	s	0.29	1.5839E+11	0.1709	0.0888	0.0000	0.0000
Br-83	2.4000	h	0.83	5.9784E+13	0.1296	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.3639E+14	7.7660E-02	0.2490	0.3190	0.0000
Se-81m	57.280	m	0.03	1.1301E+13	6.1603E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6721E+14	5.6209E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4808E+15	4.5089E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6751E+14	2.3465E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.0482E+12	1.8595E-02	0.0800	0.7182	0.0081
Xe-129m	8.8800	d	0.23	5.6355E+14	1.3760E-02	0.0513	0.1830	0.0000
Br-82m	6.0900	m	1.15	2.3271E+11	1.1931E-02	0.0028	0.0306	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
Br-84m	6.0000	m	3.33	1.3058E+11	6.7952E-03	2.7620	0.9100	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Se-83m	1.1680	m	0.57	1.9721E+10	5.2717E-03	0.9726	1.2730	0.0000
Te-129	1.1600	h	0.29	5.4721E+11	2.4548E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.1818E+10	2.0519E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.4559E+11	1.8183E-03	0.4220	0.7210	0.0000
Br-86	55.000	s	1.46	5.1422E+09	1.7515E-03	3.3060	1.9440	0.0000
Br-84	31.800	m	0.25	1.5046E+11	1.4773E-03	1.7680	1.2360	0.0000
Br-80m	4.4110	h	0.23	1.1036E+12	1.3020E-03	0.0240	0.0000	0.0000
Se-83	22.300	m	1.35	4.6150E+10	6.4615E-04	2.4290	0.4976	0.0000
Te-133m	55.400	m	0.72	8.7038E+10	4.9054E-04	1.6960	0.6000	0.0000
I-128	24.980	m	0.08	3.3102E+10	4.1374E-04	0.0915	0.7380	0.0000
Kr-85	10.750	y	0.21	5.3184E+15	2.9369E-04	0.0022	0.2507	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 159
Total activity (Ci) = 6.85050E+06

Total number of decays = 2.32181E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 1.46257E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2878
Average beta E (MeV) = 0.46571
Average alpha E (MeV) = 4.09853E-11

Composite Exposure Rate Conversion Factor = 24.0557156 R/hr per Ci/m2
Composite ECF per FGR table = 22.7593193 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0975418 Rem/hr per Ci/m2

Air Source

Point in time = 1.88815582 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3913E+21	6.8110E+06	1.2840	0.4639	0.0000
S-37	4.9900	m	0.40	2.0102E+17	1.2578E+04	2.9310	0.7998	0.0000
Cl-40	1.3500	m	1.48	1.0578E+16	2447.	4.0690	1.5290	0.0000
O-19	26.910	s	0.30	3.3978E+15	2365.	0.9398	1.7770	0.0000
N-13	9.9670	m	0.04	2.6317E+16	824.4	1.0200	0.0000	0.4909
Kr-83m	1.8300	h	1.09	2.8953E+17	823.3	0.0026	0.0382	0.0000
Ar-37	35.030	d	0.09	5.5019E+19	340.5	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-79m	50.000	s	6.00	3.6784E+14	137.8	0.0408	0.0000	0.0000
Kr-81m	13.200	s	0.76	6.2397E+13	88.55	0.1310	0.0595	0.0000
Xe-125m	56.000	s	5.36	1.9157E+14	64.09	0.1160	0.1370	0.0000
Xe-137	3.8180	m	0.34	1.1548E+14	9.444	0.1960	1.7030	0.0000
Kr-85m	4.4810	h	0.18	5.2882E+15	6.141	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.0036E+15	4.106	0.7960	1.3380	0.0000
Br-78	6.4600	m	0.62	6.8007E+13	3.287	0.1120	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.1768E+14	2.403	0.4320	0.0984	0.0000
N-16	7.1300	s	0.28	5.9502E+11	1.563	4.6030	2.6930	0.0000
Cl-38	37.200	m	0.27	1.3317E+14	1.118	1.5110	1.5200	0.0000
Xe-127m	1.1600	m	1.29	3.9835E+12	1.072	0.1680	0.1290	0.0000
Se-79m	3.9000	m	0.51	1.2197E+13	0.9764	0.0139	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3840E+14	0.7772	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	3.1685E+15	0.4709	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.3642E+15	0.4200	0.2690	0.0323	0.0000
F-20	11.030	s	0.27	1.6340E+11	0.2775	1.6340	2.4810	0.0000
S-35	87.310	d	0.18	8.4179E+16	0.2091	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	1.0973E+13	0.1857	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	5.9681E+13	0.1294	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.3834E+14	7.8769E-02	0.2490	0.3190	0.0000
Se-77m	17.360	s	0.29	6.4299E+10	6.9387E-02	0.0888	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1250E+13	6.1323E-02	0.0182	0.0002	0.0000
Xe-133m	2.1880	d	0.50	5.6716E+14	5.6205E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4808E+15	4.5088E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6754E+14	2.3466E-02	0.0463	0.1360	0.0000
Br-80	17.600	m	0.28	1.0339E+12	1.8341E-02	0.0800	0.7182	0.0081
Xe-129m	8.8800	d	0.23	5.6354E+14	1.3760E-02	0.0513	0.1830	0.0000
Br-82m	6.0900	m	1.15	2.2295E+11	1.1430E-02	0.0028	0.0306	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-84m	6.0000	m	3.33	1.2503E+11	6.5061E-03	2.7620	0.9100	0.0000
Se-83m	1.1680	m	0.57	1.5774E+10	4.2167E-03	0.9726	1.2730	0.0000
Te-129	1.1600	h	0.29	5.4516E+11	2.4456E-03	0.0631	0.5420	0.0000
Te-133	12.450	m	2.41	8.0193E+10	2.0111E-03	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	1.4408E+11	1.7994E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	1.4923E+11	1.4652E-03	1.7680	1.2360	0.0000
Br-86	55.000	s	1.46	3.8688E+09	1.3177E-03	3.3060	1.9440	0.0000
Br-80m	4.4110	h	0.23	1.1025E+12	1.3007E-03	0.0240	0.0000	0.0000
Se-83	22.300	m	1.35	4.5613E+10	6.3864E-04	2.4290	0.4976	0.0000
Te-133m	55.400	m	0.72	8.6629E+10	4.8823E-04	1.6960	0.6000	0.0000
I-128	24.980	m	0.08	3.2758E+10	4.0945E-04	0.0915	0.7380	0.0000
Kr-85	10.750	y	0.21	5.3195E+15	2.9375E-04	0.0022	0.2507	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 159
Total activity (Ci) = 6.83090E+06

Total number of decays = 2.89326E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 1.82255E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2876
Average beta E (MeV) = 0.46526
Average alpha E (MeV) = 4.57736E-12

Composite Exposure Rate Conversion Factor = 24.0532990 R/hr per Ci/m2
Composite ECF per FGR table = 22.7702465 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0946884 Rem/hr per Ci/m2

Air Source

Point in time = 2.35812044 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3842E+21	6.7908E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	1.8831E+17	1.1783E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500	m	1.48	8.3104E+15	1922.	4.0690	1.5290	0.0000	0.0000
O-19	26.910	s	0.30	1.6435E+15	1144.	0.9398	1.7770	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8867E+17	820.9	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	2.5471E+16	797.9	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030	d	0.09	5.5018E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-79m	50.000	s	6.00	2.4882E+14	93.23	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000	s	5.36	1.3513E+14	45.20	0.1160	0.1370	0.0000	0.0000
Kr-81m	13.200	s	0.76	1.4194E+13	20.14	0.1310	0.0595	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.0604E+14	8.672	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2818E+15	6.134	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.9937E+14	4.088	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	6.4663E+13	3.125	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.1520E+14	2.352	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3201E+14	1.108	1.5110	1.5200	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.1219E+13	0.8982	0.0139	0.0000	0.0000	0.0000
Xe-127m	1.1600	m	1.29	3.0082E+12	0.8097	0.1680	0.1290	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3759E+14	0.7727	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.2870E+15	0.4885	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.4202E+15	0.4373	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4179E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.0844E+13	0.1835	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.9550E+13	0.1291	0.0065	0.3249	0.0000	0.0000
N-16	7.1300	s	0.28	3.8372E+10	0.1008	4.6030	2.6930	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.4072E+14	8.0126E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1186E+13	6.0975E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6711E+14	5.6199E-02	0.0414	0.1920	0.0000	0.0000
F-20	11.030	s	0.27	2.7776E+10	4.7176E-02	1.6340	2.4810	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4808E+15	4.5087E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6757E+14	2.3468E-02	0.0463	0.1360	0.0000	0.0000
Se-77m	17.360	s	0.29	2.0856E+10	2.2507E-02	0.0888	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.0162E+12	1.8028E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6353E+14	1.3760E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.1134E+11	1.0835E-02	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.1842E+11	6.1623E-03	2.7620	0.9100	0.0000	0.0000
Se-83m	1.1680	m	0.57	1.1935E+10	3.1904E-03	0.9726	1.2730	0.0000	0.0000
Te-129	1.1600	h	0.29	5.4262E+11	2.4342E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	7.8210E+10	1.9614E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.4222E+11	1.7762E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.4771E+11	1.4503E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.1012E+12	1.2991E-03	0.0240	0.0000	0.0000	0.0000
Br-86	55.000	s	1.46	2.7117E+09	9.2363E-04	3.3060	1.9440	0.0000	0.0000
Se-83	22.300	m	1.35	4.4951E+10	6.2938E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	8.6121E+10	4.8537E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	3.2334E+10	4.0414E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3209E+15	2.9383E-04	0.0022	0.2507	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228203D+24
Difference in atom count = 3.49E+09
Fractional difference = 2.20E-15

Total number of nuclides = 160
Total activity (Ci) = 6.80798E+06

Total number of decays = 3.60474E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 2.27073E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2873
Average beta E (MeV) = 0.46491
Average alpha E (MeV) = 2.96179E-13

Composite Exposure Rate Conversion Factor = 24.0495300 R/hr per Ci/m2
Composite ECF per FGR table = 22.7790070 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0908279 Rem/hr per Ci/m2

Air Source

Point in time = 2.94506025 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3754E+21	6.7657E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	1.7357E+17	1.0860E+04	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500	m	1.48	6.1481E+15	1422.	4.0690	1.5290	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8760E+17	817.8	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	2.4452E+16	766.0	1.0200	0.0000	0.4909	0.0000
O-19	26.910	s	0.30	6.6345E+14	461.9	0.9398	1.7770	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5018E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.5271E+14	57.22	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000	s	5.36	8.7385E+13	29.23	0.1160	0.1370	0.0000	0.0000
Xe-137	3.8180	m	0.34	9.5320E+13	7.795	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2738E+15	6.124	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.9405E+14	4.067	0.7960	1.3380	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.2335E+12	3.170	0.1310	0.0595	0.0000	0.0000
Br-78	6.4600	m	0.62	6.0716E+13	2.935	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.1218E+14	2.291	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	1.3058E+14	1.096	1.5110	1.5200	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.0108E+13	0.8092	0.0139	0.0000	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3659E+14	0.7670	1.4500	0.8276	0.0000	0.0000
Xe-127m	1.1600	m	1.29	2.1183E+12	0.5702	0.1680	0.1290	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.3825E+15	0.5027	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.4673E+15	0.4518	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4179E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.0686E+13	0.1808	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.9387E+13	0.1288	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.4362E+14	8.1778E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1107E+13	6.0543E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6703E+14	5.6192E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4807E+15	4.5086E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6761E+14	2.3469E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	9.9470E+11	1.7646E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6351E+14	1.3759E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.9768E+11	1.0135E-02	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.1066E+11	5.7583E-03	2.7620	0.9100	0.0000	0.0000
Se-77m	17.360	s	0.29	5.1118E+09	5.5163E-03	0.0888	0.0000	0.0000	0.0000
F-20	11.030	s	0.27	3.0378E+09	5.1594E-03	1.6340	2.4810	0.0000	0.0000
N-16	7.1300	s	0.28	1.2507E+09	3.2862E-03	4.6030	2.6930	0.0000	0.0000
Te-129	1.1600	h	0.29	5.3946E+11	2.4200E-03	0.0631	0.5420	0.0000	0.0000
Se-83m	1.1680	m	0.57	8.4245E+09	2.2520E-03	0.9726	1.2730	0.0000	0.0000
Te-133	12.450	m	2.41	7.5804E+10	1.9011E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.3993E+11	1.7476E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.4583E+11	1.4318E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0995E+12	1.2971E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.4139E+10	6.1800E-04	2.4290	0.4976	0.0000	0.0000
Br-86	55.000	s	1.46	1.7398E+09	5.9258E-04	3.3060	1.9440	0.0000	0.0000
Te-133m	55.400	m	0.72	8.5491E+10	4.8182E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	3.1811E+10	3.9761E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3226E+15	2.9392E-04	0.0022	0.2507	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 160
Total activity (Ci) = 6.78062E+06

Total number of decays = 4.49003E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 2.82840E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2869
Average beta E (MeV) = 0.46467
Average alpha E (MeV) = 9.69307E-15

Composite Exposure Rate Conversion Factor = 24.0447884 R/hr per Ci/m2
Composite ECF per FGR table = 22.7861309 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0862312 Rem/hr per Ci/m2

Air Source

Point in time = 3.67809343 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3644E+21	6.7344E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	1.5677E+17	9809.	2.9310	0.7998	0.0000	0.0000
Cl-40	1.3500	m	1.48	4.2198E+15	975.9	4.0690	1.5290	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8628E+17	814.1	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	2.3237E+16	727.9	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030	d	0.09	5.5017E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
O-19	26.910	s	0.30	2.1370E+14	148.8	0.9398	1.7770	0.0000	0.0000
Kr-79m	50.000	s	6.00	8.2998E+13	31.10	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000	s	5.36	5.0700E+13	16.96	0.1160	0.1370	0.0000	0.0000
Xe-137	3.8180	m	0.34	8.3443E+13	6.824	0.1960	1.7030	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2638E+15	6.113	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.8746E+14	4.040	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	5.6124E+13	2.713	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.0851E+14	2.216	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2881E+14	1.081	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3535E+14	0.7601	1.4500	0.8276	0.0000	0.0000
Se-79m	3.9000	m	0.51	8.8731E+12	0.7104	0.0139	0.0000	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4514E+15	0.5129	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5033E+15	0.4629	0.2690	0.0323	0.0013	0.0000
Xe-127m	1.1600	m	1.29	1.3670E+12	0.3679	0.1680	0.1290	0.0000	0.0000
Kr-81m	13.200	s	0.76	2.2180E+11	0.3148	0.1310	0.0595	0.0000	0.0000
S-35	87.310	d	0.18	8.4178E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.0492E+13	0.1776	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.9181E+13	0.1283	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.4713E+14	8.3777E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1009E+13	6.0009E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6694E+14	5.6182E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4806E+15	4.5085E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6767E+14	2.3472E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	9.6847E+11	1.7181E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6349E+14	1.3759E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.8186E+11	9.3236E-03	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.0167E+11	5.2907E-03	2.7620	0.9100	0.0000	0.0000
Te-129	1.1600	h	0.29	5.3554E+11	2.4024E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	7.2906E+10	1.8284E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.3713E+11	1.7126E-03	0.4220	0.7210	0.0000	0.0000
Se-83m	1.1680	m	0.57	5.4528E+09	1.4576E-03	0.9726	1.2730	0.0000	0.0000
Br-84	31.800	m	0.25	1.4352E+11	1.4092E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0974E+12	1.2946E-03	0.0240	0.0000	0.0000	0.0000
Se-77m	17.360	s	0.29	8.8288E+08	9.5275E-04	0.0888	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.3144E+10	6.0408E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	8.4711E+10	4.7742E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	3.1171E+10	3.8961E-04	0.0915	0.7380	0.0000	0.0000
Br-86	55.000	s	1.46	9.9945E+08	3.4043E-04	3.3060	1.9440	0.0000	0.0000
F-20	11.030	s	0.27	1.9151E+08	3.2527E-04	1.6340	2.4810	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3247E+15	2.9404E-04	0.0022	0.2507	0.0000	0.0000
Br-77m	4.2800	m	2.34	1.9606E+09	1.4303E-04	0.0195	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 158
Total activity (Ci) = 6.74743E+06

Total number of decays = 5.59075E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 3.52177E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2865
Average beta E (MeV) = 0.46449
Average alpha E (MeV) = 1.35414E-16

Composite Exposure Rate Conversion Factor = 24.0394840 R/hr per Ci/m2
Composite ECF per FGR table = 22.7921982 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0812244 Rem/hr per Ci/m2

Air Source

Point in time = 4.59357548 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3507E+21	6.6955E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	1.3805E+17	8638.	2.9310	0.7998	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8463E+17	809.4	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	2.1804E+16	683.0	1.0200	0.0000	0.4909	0.0000
Cl-40	1.3500	m	1.48	2.6372E+15	609.9	4.0690	1.5290	0.0000	0.0000
Ar-37	35.030	d	0.09	5.5017E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
O-19	26.910	s	0.30	5.1920E+13	36.14	0.9398	1.7770	0.0000	0.0000
Kr-79m	50.000	s	6.00	3.8758E+13	14.52	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000	s	5.36	2.5688E+13	8.594	0.1160	0.1370	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2514E+15	6.099	0.1570	0.2282	0.0000	0.0000
Xe-137	3.8180	m	0.34	7.0665E+13	5.779	0.1960	1.7030	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.7928E+14	4.006	0.7960	1.3380	0.0000	0.0000
Br-78	6.4600	m	0.62	5.0873E+13	2.459	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.0410E+14	2.126	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2663E+14	1.063	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3381E+14	0.7514	1.4500	0.8276	0.0000	0.0000
Se-79m	3.9000	m	0.51	7.5407E+12	0.6037	0.0139	0.0000	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4946E+15	0.5193	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5273E+15	0.4703	0.2690	0.0323	0.0013	0.0000
Xe-127m	1.1600	m	1.29	7.9102E+11	0.2129	0.1680	0.1290	0.0000	0.0000
S-35	87.310	d	0.18	8.4178E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	1.0256E+13	0.1736	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.8925E+13	0.1278	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.5134E+14	8.6175E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.0888E+13	5.9348E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6683E+14	5.6171E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4805E+15	4.5083E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6773E+14	2.3474E-02	0.0463	0.1360	0.0000	0.0000
Kr-81m	13.200	s	0.76	1.2396E+10	1.7593E-02	0.1310	0.0595	0.0000	0.0000
Br-80	17.600	m	0.28	9.3676E+11	1.6618E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6346E+14	1.3758E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.6386E+11	8.4010E-03	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-84m	6.0000	m	3.33	9.1467E+10	4.7598E-03	2.7620	0.9100	0.0000	0.0000
Te-129	1.1600	h	0.29	5.3068E+11	2.3807E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	6.9448E+10	1.7417E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.3370E+11	1.6698E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.4068E+11	1.3813E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0947E+12	1.2915E-03	0.0240	0.0000	0.0000	0.0000
Se-83m	1.1680	m	0.57	3.1671E+09	8.4664E-04	0.9726	1.2730	0.0000	0.0000
Se-83	22.300	m	1.35	4.1934E+10	5.8713E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	8.3746E+10	4.7198E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	3.0389E+10	3.7983E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3274E+15	2.9419E-04	0.0022	0.2507	0.0000	0.0000
Br-86	55.000	s	1.46	5.0017E+08	1.7037E-04	3.3060	1.9440	0.0000	0.0000
Xe-127	36.400	d	0.27	2.3828E+13	1.4194E-04	0.2710	0.0307	0.0000	0.0000
Br-77m	4.2800	m	2.34	1.6904E+09	1.2332E-04	0.0195	0.0000	0.0000	0.0000
Se-77m	17.360	s	0.29	9.8494E+07	1.0629E-04	0.0888	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228203D+24
Difference in atom count = 3.22E+09
Fractional difference = 2.03E-15

Total number of nuclides = 157
Total activity (Ci) = 6.70684E+06

Total number of decays = 6.95794E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 4.38300E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2861
Average beta E (MeV) = 0.46435
Average alpha E (MeV) = 6.53393E-19

Composite Exposure Rate Conversion Factor = 24.0339470 R/hr per Ci/m2
Composite ECF per FGR table = 22.7976933 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0760860 Rem/hr per Ci/m2

Air Source

Point in time = 5.73692894 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3338E+21	6.6473E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	1.1777E+17	7369.	2.9310	0.7998	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8258E+17	803.5	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	2.0137E+16	630.8	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030	d	0.09	5.5016E+19	340.5	0.0002	0.0019	0.0000	0.0000
Cl-40	1.3500	m	1.48	1.4662E+15	339.1	4.0690	1.5290	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
O-19	26.910	s	0.30	8.8701E+12	6.175	0.9398	1.7770	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2360E+15	6.081	0.1570	0.2282	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.4974E+13	5.610	0.0408	0.0000	0.0000	0.0000
Xe-137	3.8180	m	0.34	5.7420E+13	4.696	0.1960	1.7030	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.6916E+14	3.965	0.7960	1.3380	0.0000	0.0000
Xe-125m	56.000	s	5.36	1.0989E+13	3.676	0.1160	0.1370	0.0000	0.0000
Br-78	6.4600	m	0.62	4.4999E+13	2.175	0.1120	0.0000	0.0000	0.0000
Xe-135m	15.290	m	0.33	9.8841E+13	2.018	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2396E+14	1.040	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.3192E+14	0.7408	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.5170E+15	0.5227	0.2570	0.0053	0.0183	0.0000
Se-79m	3.9000	m	0.51	6.1541E+12	0.4927	0.0139	0.0000	0.0000	0.0000
Xe-125	16.900	h	1.18	1.5408E+15	0.4744	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4177E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	9.9716E+12	0.1687	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.8604E+13	0.1271	0.0065	0.3249	0.0000	0.0000
Xe-127m	1.1600	m	1.29	3.9946E+11	0.1075	0.1680	0.1290	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.5635E+14	8.9024E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.0738E+13	5.8532E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6668E+14	5.6157E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4804E+15	4.5081E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6782E+14	2.3478E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	8.9871E+11	1.5943E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6342E+14	1.3757E-02	0.0513	0.1830	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.4387E+11	7.3759E-03	0.0028	0.0306	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-84m	6.0000	m	3.33	8.0149E+10	4.1708E-03	2.7620	0.9100	0.0000	0.0000
Te-129	1.1600	h	0.29	5.2468E+11	2.3537E-03	0.0631	0.5420	0.0000	0.0000
Te-133	12.450	m	2.41	6.5367E+10	1.6393E-03	0.9540	0.7970	0.0000	0.0000
Te-131	25.000	m	0.40	1.2954E+11	1.6179E-03	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	1.3722E+11	1.3473E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0915E+12	1.2877E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	4.0470E+10	5.6663E-04	2.4290	0.4976	0.0000	0.0000
Kr-81m	13.200	s	0.76	3.3792E+08	4.7959E-04	0.1310	0.0595	0.0000	0.0000
Te-133m	55.400	m	0.72	8.2556E+10	4.6528E-04	1.6960	0.6000	0.0000	0.0000
Se-83m	1.1680	m	0.57	1.6069E+09	4.2956E-04	0.9726	1.2730	0.0000	0.0000
I-128	24.980	m	0.08	2.9440E+10	3.6797E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3307E+15	2.9437E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4219E+13	1.4427E-04	0.2710	0.0307	0.0000	0.0000
Br-77m	4.2800	m	2.34	1.4047E+09	1.0247E-04	0.0195	0.0000	0.0000	0.0000
Br-86	55.000	s	1.46	2.1069E+08	7.1764E-05	3.3060	1.9440	0.0000	0.0000
I-131	8.0230	d	0.02	2.6347E+12	7.1204E-05	0.3823	0.1920	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228204D+24

Total number of nuclides = 157
Total activity (Ci) = 6.65696E+06

Total number of decays = 8.65396E+19
Asympt number of decays = 1.58748E+24
Percent of decays = 5.45137E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2857
Average beta E (MeV) = 0.46425
Average alpha E (MeV) = 8.35719E-22

Composite Exposure Rate Conversion Factor = 24.0284557 R/hr per Ci/m2
Composite ECF per FGR table = 22.8029041 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0710373 Rem/hr per Ci/m2

Air Source

Point in time = 7.16485834 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.3128E+21	6.5875E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	9.6585E+16	6043.	2.9310	0.7998	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.8004E+17	796.3	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	1.8233E+16	571.2	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030	d	0.09	5.5015E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-40	1.3500	m	1.48	7.0435E+14	162.9	4.0690	1.5290	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.2167E+15	6.058	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.5668E+14	3.914	0.7960	1.3380	0.0000	0.0000
Xe-137	3.8180	m	0.34	4.4307E+13	3.623	0.1960	1.7030	0.0000	0.0000
Xe-135m	15.290	m	0.33	9.2646E+13	1.892	0.4320	0.0984	0.0000	0.0000
Br-78	6.4600	m	0.62	3.8607E+13	1.866	0.1120	0.0000	0.0000	0.0000
Kr-79m	50.000	s	6.00	4.5659E+12	1.711	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000	s	5.36	3.8055E+12	1.273	0.1160	0.1370	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2070E+14	1.013	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.2959E+14	0.7277	1.4500	0.8276	0.0000	0.0000
O-19	26.910	s	0.30	9.7614E+11	0.6795	0.9398	1.7770	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.5258E+15	0.5240	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5465E+15	0.4762	0.2690	0.0323	0.0013	0.0000
Se-79m	3.9000	m	0.51	4.7747E+12	0.3823	0.0139	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	8.4177E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450	m	0.65	9.6297E+12	0.1630	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.8205E+13	0.1262	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.6222E+14	9.2367E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280	m	0.03	1.0554E+13	5.7529E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6651E+14	5.6139E-02	0.0414	0.1920	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.7018E+11	4.5807E-02	0.1680	0.1290	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4803E+15	4.5079E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6792E+14	2.3482E-02	0.0463	0.1360	0.0000	0.0000
Br-80	17.600	m	0.28	8.5353E+11	1.5142E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800	d	0.23	5.6338E+14	1.3756E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.2229E+11	6.2695E-03	0.0028	0.0306	0.0000	0.0000
Br-84m	6.0000	m	3.33	6.7961E+10	3.5365E-03	2.7620	0.9100	0.0000	0.0000
Te-129	1.1600	h	0.29	5.1728E+11	2.3205E-03	0.0631	0.5420	0.0000	0.0000
Te-131	25.000	m	0.40	1.2453E+11	1.5553E-03	0.4220	0.7210	0.0000	0.0000
Te-133	12.450	m	2.41	6.0617E+10	1.5202E-03	0.9540	0.7970	0.0000	0.0000
Br-84	31.800	m	0.25	1.3302E+11	1.3060E-03	1.7680	1.2360	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0874E+12	1.2828E-03	0.0240	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	3.8713E+10	5.4203E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	8.1095E+10	4.5704E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	2.8296E+10	3.5368E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3348E+15	2.9460E-04	0.0022	0.2507	0.0000	0.0000
Se-83m	1.1680	m	0.57	6.8860E+08	1.8408E-04	0.9726	1.2730	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4448E+13	1.4563E-04	0.2710	0.0307	0.0000	0.0000
Br-77m	4.2800	m	2.34	1.1147E+09	8.1316E-05	0.0195	0.0000	0.0000	0.0000
I-131	8.0230	d	0.02	2.6396E+12	7.1335E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2737E+11	7.0889E-05	0.0050	0.2245	0.0000	0.0000
Br-82	1.4720	d	0.08	4.2597E+11	6.2745E-05	2.6600	0.1439	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 157
Total activity (Ci) = 6.59563E+06

Total number of decays = 1.07545E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 6.77454E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2853
Average beta E (MeV) = 0.46415
Average alpha E (MeV) = 2.03625E-25

Composite Exposure Rate Conversion Factor = 24.0231800 R/hr per Ci/m2
Composite ECF per FGR table = 22.8079128 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0662308 Rem/hr per Ci/m2

Air Source

Point in time = 8.94820118 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.2869E+21	6.5137E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900 m 0.40	7.5392E+16	4717.	2.9310	0.7998	0.0000	0.0000
Kr-83m	1.8300 h 1.09	2.7691E+17	787.4	0.0026	0.0382	0.0000	0.0000
N-13	9.9670 m 0.04	1.6107E+16	504.6	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030 d 0.09	5.5013E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-40	1.3500 m 1.48	2.8192E+14	65.20	4.0690	1.5290	0.0000	0.0000
Kr-85m	4.4810 h 0.18	5.1928E+15	6.030	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720 h 0.79	9.4131E+14	3.851	0.7960	1.3380	0.0000	0.0000
Xe-137	3.8180 m 0.34	3.2053E+13	2.621	0.1960	1.7030	0.0000	0.0000
Xe-135m	15.290 m 0.33	8.5451E+13	1.745	0.4320	0.0984	0.0000	0.0000
Br-78	6.4600 m 0.62	3.1883E+13	1.541	0.1120	0.0000	0.0000	0.0000
Cl-38	37.200 m 0.27	1.1676E+14	0.9800	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600 m 0.36	1.2674E+14	0.7117	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590 d 0.29	3.5272E+15	0.5242	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	1.5474E+15	0.4765	0.2690	0.0323	0.0013	0.0000
Kr-79m	50.000 s 6.00	1.0359E+12	0.3881	0.0408	0.0000	0.0000	0.0000
Xe-125m	56.000 s 5.36	1.0121E+12	0.3386	0.1160	0.1370	0.0000	0.0000
Se-79m	3.9000 m 0.51	3.4777E+12	0.2784	0.0139	0.0000	0.0000	0.0000
S-35	87.310 d 0.18	8.4176E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-81	18.450 m 0.65	9.2235E+12	0.1561	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000 h 0.83	5.7710E+13	0.1251	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.6900E+14	9.6227E-02	0.2490	0.3190	0.0000	0.0000
Se-81m	57.280 m 0.03	1.0329E+13	5.6301E-02	0.0182	0.0002	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.6628E+14	5.6117E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4801E+15	4.5075E-02	0.0200	0.1430	0.0000	0.0000
O-19	26.910 s 0.30	6.2022E+10	4.3177E-02	0.9398	1.7770	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.6805E+14	2.3487E-02	0.0463	0.1360	0.0000	0.0000
Xe-127m	1.1600 m 1.29	5.8630E+10	1.5781E-02	0.1680	0.1290	0.0000	0.0000
Br-80	17.600 m 0.28	8.0053E+11	1.4202E-02	0.0800	0.7182	0.0081	0.0000
Xe-129m	8.8800 d 0.23	5.6333E+14	1.3755E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-82m	6.0900 m 1.15	9.9822E+10	5.1178E-03	0.0028	0.0306	0.0000	0.0000
Br-84m	6.0000 m 3.33	5.5308E+10	2.8781E-03	2.7620	0.9100	0.0000	0.0000
Te-129	1.1600 h 0.29	5.0818E+11	2.2797E-03	0.0631	0.5420	0.0000	0.0000
Te-131	25.000 m 0.40	1.1854E+11	1.4805E-03	0.4220	0.7210	0.0000	0.0000
Te-133	12.450 m 2.41	5.5186E+10	1.3840E-03	0.9540	0.7970	0.0000	0.0000
Br-80m	4.4110 h 0.23	1.0823E+12	1.2769E-03	0.0240	0.0000	0.0000	0.0000
Br-84	31.800 m 0.25	1.2795E+11	1.2562E-03	1.7680	1.2360	0.0000	0.0000
Se-83	22.300 m 1.35	3.6625E+10	5.1280E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400 m 0.72	7.9305E+10	4.4696E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980 m 0.08	2.6930E+10	3.3660E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750 y 0.21	5.3399E+15	2.9488E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400 d 0.27	2.4559E+13	1.4629E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230 d 0.02	2.6454E+12	7.1492E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500 h 0.64	1.2709E+11	7.0734E-05	0.0050	0.2245	0.0000	0.0000
Br-82	1.4720 d 0.08	4.4764E+11	6.5937E-05	2.6600	0.1439	0.0000	0.0000
Se-83m	1.1680 m 0.57	2.3897E+08	6.3882E-05	0.9726	1.2730	0.0000	0.0000
Br-77m	4.2800 m 2.34	8.3506E+08	6.0918E-05	0.0195	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 156
Total activity (Ci) = 6.52026E+06

Total number of decays = 1.33507E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 8.41000E-03
Average chain length = 1.0000

Average gamma E (MeV) = 1.2849
Average beta E (MeV) = 0.46407
Average alpha E (MeV) = 6.25515E-30

Composite Exposure Rate Conversion Factor = 24.0182629 R/hr per Ci/m2
Composite ECF per FGR table = 22.8126793 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0617771 Rem/hr per Ci/m2

Air Source

Point in time = 11.1754322 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.2549E+21	6.4226E+06	1.2840	0.4639	0.0000	0.0000
S-37	4.9900	m	0.40	5.5330E+16	3462.	2.9310	0.7998	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.7304E+17	776.4	0.0026	0.0382	0.0000	0.0000
N-13	9.9670	m	0.04	1.3796E+16	432.2	1.0200	0.0000	0.4909	0.0000
Ar-37	35.030	d	0.09	5.5012E+19	340.5	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Cl-40	1.3500	m	1.48	8.9845E+13	20.78	4.0690	1.5290	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.1631E+15	5.996	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	9.2246E+14	3.774	0.7960	1.3380	0.0000	0.0000
Xe-137	3.8180	m	0.34	2.1392E+13	1.749	0.1960	1.7030	0.0000	0.0000
Xe-135m	15.290	m	0.33	7.7244E+13	1.577	0.4320	0.0984	0.0000	0.0000
Br-78	6.4600	m	0.62	2.5106E+13	1.213	0.1120	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.1201E+14	0.9401	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.2327E+14	0.6922	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.5255E+15	0.5239	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5459E+15	0.4760	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4175E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Se-79m	3.9000	m	0.51	2.3409E+12	0.1874	0.0139	0.0000	0.0000	0.0000
Se-81	18.450	m	0.65	8.7464E+12	0.1480	0.0080	0.6107	0.0000	0.0000
Br-83	2.4000	h	0.83	5.7098E+13	0.1238	0.0065	0.3249	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.7667E+14	0.1006	0.2490	0.3190	0.0000	0.0000
Xe-125m	56.000	s	5.36	1.9359E+11	6.4761E-02	0.1160	0.1370	0.0000	0.0000
Kr-79m	50.000	s	6.00	1.6246E+11	6.0871E-02	0.0408	0.0000	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6601E+14	5.6090E-02	0.0414	0.1920	0.0000	0.0000
Se-81m	57.280	m	0.03	1.0054E+13	5.4804E-02	0.0182	0.0002	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4799E+15	4.5071E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6821E+14	2.3494E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6326E+14	1.3753E-02	0.0513	0.1830	0.0000	0.0000
Br-80	17.600	m	0.28	7.3933E+11	1.3116E-02	0.0800	0.7182	0.0081	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Xe-127m	1.1600	m	1.29	1.5493E+10	4.1701E-03	0.1680	0.1290	0.0000	0.0000
Br-82m	6.0900	m	1.15	7.7470E+10	3.9718E-03	0.0028	0.0306	0.0000	0.0000
Te-129	1.1600	h	0.29	4.9704E+11	2.2298E-03	0.0631	0.5420	0.0000	0.0000
Br-84m	6.0000	m	3.33	4.2760E+10	2.2252E-03	2.7620	0.9100	0.0000	0.0000
Te-131	25.000	m	0.40	1.1147E+11	1.3922E-03	0.4220	0.7210	0.0000	0.0000
O-19	26.910	s	0.30	1.9845E+09	1.3815E-03	0.9398	1.7770	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0760E+12	1.2694E-03	0.0240	0.0000	0.0000	0.0000
Te-133	12.450	m	2.41	4.9109E+10	1.2316E-03	0.9540	0.7970	0.0000	0.0000
Br-84	31.800	m	0.25	1.2188E+11	1.1967E-03	1.7680	1.2360	0.0000	0.0000
Se-83	22.300	m	1.35	3.4176E+10	4.7850E-04	2.4290	0.4976	0.0000	0.0000
Te-133m	55.400	m	0.72	7.7126E+10	4.3467E-04	1.6960	0.6000	0.0000	0.0000
I-128	24.980	m	0.08	2.5316E+10	3.1643E-04	0.0915	0.7380	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3463E+15	2.9523E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4601E+13	1.4654E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.6522E+12	7.1677E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2674E+11	7.0540E-05	0.0050	0.2245	0.0000	0.0000
Br-82	1.4720	d	0.08	4.6912E+11	6.9101E-05	2.6600	0.1439	0.0000	0.0000
Br-77m	4.2800	m	2.34	5.8220E+08	4.2472E-05	0.0195	0.0000	0.0000	0.0000
I-125	59.410	d	0.02	1.1138E+13	4.0651E-05	0.0424	0.0179	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 157
Total activity (Ci) = 6.42779E+06

Total number of decays = 1.65517E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 1.04264E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2846
Average beta E (MeV) = 0.46400
Average alpha E (MeV) = 1.44675E-35

Composite Exposure Rate Conversion Factor = 24.0138035 R/hr per Ci/m2
Composite ECF per FGR table = 22.8170757 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0577545 Rem/hr per Ci/m2

Air Source

Point in time = 13.9570141 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.2156E+21	6.3106E+06	1.2840	0.4639	0.0000
S-37	4.9900	m	0.40	3.7598E+16	2353.	2.9310	0.7998	0.0000
Kr-83m	1.8300	h	1.09	2.6829E+17	762.9	0.0026	0.0382	0.0000
N-13	9.9670	m	0.04	1.1369E+16	356.2	1.0200	0.0000	0.4909
Ar-37	35.030	d	0.09	5.5009E+19	340.5	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	5.1262E+15	5.953	0.1570	0.2282	0.0000
Cl-40	1.3500	m	1.48	2.1540E+13	4.982	4.0690	1.5290	0.0000
Kr-87	1.2720	h	0.79	8.9945E+14	3.680	0.7960	1.3380	0.0000
Xe-135m	15.290	m	0.33	6.8093E+13	1.390	0.4320	0.0984	0.0000
Xe-137	3.8180	m	0.34	1.2911E+13	1.056	0.1960	1.7030	0.0000
Br-78	6.4600	m	0.62	1.8628E+13	0.9003	0.1120	0.0000	0.0000
Cl-38	37.200	m	0.27	1.0635E+14	0.8927	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.1907E+14	0.6687	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	3.5224E+15	0.5235	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.5431E+15	0.4751	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4174E+16	0.2090	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	8.1943E+12	0.1387	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	5.6341E+13	0.1222	0.0065	0.3249	0.0000
Se-79m	3.9000	m	0.51	1.4278E+12	0.1143	0.0139	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.8513E+14	0.1054	0.2490	0.3190	0.0000
Xe-133m	2.1880	d	0.50	5.6566E+14	5.6056E-02	0.0414	0.1920	0.0000
Se-81m	57.280	m	0.03	9.7213E+12	5.2990E-02	0.0182	0.0002	0.0000
Xe-131m	11.930	d	0.13	2.4796E+15	4.5066E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6841E+14	2.3502E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.6317E+14	1.3751E-02	0.0513	0.1830	0.0000
Br-80	17.600	m	0.28	6.7001E+11	1.1886E-02	0.0800	0.7182	0.0000
Xe-125m	56.000	s	5.36	2.4532E+10	8.2066E-03	0.1160	0.1370	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Kr-79m	50.000	s	6.00	1.6068E+10	6.0201E-03	0.0408	0.0000	0.0000
Br-82m	6.0900	m	1.15	5.6447E+10	2.8940E-03	0.0028	0.0306	0.0000
Te-129	1.1600	h	0.29	4.8348E+11	2.1689E-03	0.0631	0.5420	0.0000
Br-84m	6.0000	m	3.33	3.1009E+10	1.6136E-03	2.7620	0.9100	0.0000
Te-131	25.000	m	0.40	1.0323E+11	1.2893E-03	0.4220	0.7210	0.0000
Br-80m	4.4110	h	0.23	1.0682E+12	1.2602E-03	0.0240	0.0000	0.0000
Br-84	31.800	m	0.25	1.1471E+11	1.1263E-03	1.7680	1.2360	0.0000
Te-133	12.450	m	2.41	4.2491E+10	1.0656E-03	0.9540	0.7970	0.0000
Xe-127m	1.1600	m	1.29	2.9396E+09	7.9124E-04	0.1680	0.1290	0.0000
Se-83	22.300	m	1.35	3.1345E+10	4.3887E-04	2.4290	0.4976	0.0000
Te-133m	55.400	m	0.72	7.4488E+10	4.1980E-04	1.6960	0.6000	0.0000
Kr-85	10.750	y	0.21	5.3542E+15	2.9567E-04	0.0022	0.2507	0.0000
I-128	24.980	m	0.08	2.3436E+10	2.9293E-04	0.0915	0.7380	0.0000
Xe-127	36.400	d	0.27	2.4613E+13	1.4661E-04	0.2710	0.0307	0.0000
Br-82	1.4720	d	0.08	4.8920E+11	7.2059E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.6602E+12	7.1892E-05	0.3823	0.1920	0.0000
Te-127	9.3500	h	0.64	1.2631E+11	7.0299E-05	0.0050	0.2245	0.0000
I-125	59.410	d	0.02	1.4075E+13	5.1368E-05	0.0424	0.0179	0.0000
Br-77m	4.2800	m	2.34	3.7105E+08	2.7068E-05	0.0195	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.5099E+11	2.6190E-05	1.4200	0.0523	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 155
Total activity (Ci) = 6.31459E+06

Total number of decays = 2.04859E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 1.29046E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2843
Average beta E (MeV) = 0.46394
Average alpha E (MeV) = 1.32423E-42

Composite Exposure Rate Conversion Factor = 24.0099220 R/hr per Ci/m2
Composite ECF per FGR table = 22.8209324 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0542660 Rem/hr per Ci/m2

Air Source

Point in time = 17.4309502 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.1674E+21	6.1735E+06	1.2840	0.4639	0.0000
S-37	4.9900	m	0.40	2.3205E+16	1452.	2.9310	0.7998	0.0000
Kr-83m	1.8300	h	1.09	2.6247E+17	746.4	0.0026	0.0382	0.0000
Ar-37	35.030	d	0.09	5.5007E+19	340.5	0.0002	0.0019	0.0000
N-13	9.9670	m	0.04	8.9290E+15	279.7	1.0200	0.0000	0.4909
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	5.0805E+15	5.900	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	8.7151E+14	3.565	0.7960	1.3380	0.0000
Xe-135m	15.290	m	0.33	5.8171E+13	1.188	0.4320	0.0984	0.0000
Cl-40	1.3500	m	1.48	3.6191E+12	0.8370	4.0690	1.5290	0.0000
Cl-38	37.200	m	0.27	9.9688E+13	0.8367	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.1402E+14	0.6403	1.4500	0.8276	0.0000
Br-78	6.4600	m	0.62	1.2831E+13	0.6202	0.1120	0.0000	0.0000
Xe-137	3.8180	m	0.34	6.8714E+12	0.5619	0.1960	1.7030	0.0000
Kr-79	1.4590	d	0.29	3.5184E+15	0.5229	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.5395E+15	0.4740	0.2690	0.0323	0.0000
S-35	87.310	d	0.18	8.4172E+16	0.2090	0.0000	0.0486	0.0000
Se-81	18.450	m	0.65	7.5665E+12	0.1280	0.0080	0.6107	0.0000
Br-83	2.4000	h	0.83	5.5410E+13	0.1201	0.0065	0.3249	0.0000
Xe-135	9.1390	h	0.22	1.9415E+14	0.1106	0.2490	0.3190	0.0000
Se-79m	3.9000	m	0.51	7.7008E+11	6.1651E-02	0.0139	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6523E+14	5.6013E-02	0.0414	0.1920	0.0000
Se-81m	57.280	m	0.03	9.3211E+12	5.0809E-02	0.0182	0.0002	0.0000
Xe-131m	11.930	d	0.13	2.4793E+15	4.5060E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.6866E+14	2.3513E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.6307E+14	1.3749E-02	0.0513	0.1830	0.0000
Br-80	17.600	m	0.28	5.9338E+11	1.0527E-02	0.0800	0.7182	0.0081
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Te-129	1.1600	h	0.29	4.6705E+11	2.0952E-03	0.0631	0.5420	0.0000
Br-82m	6.0900	m	1.15	3.8012E+10	1.9488E-03	0.0028	0.0306	0.0000
Br-80m	4.4110	h	0.23	1.0586E+12	1.2488E-03	0.0240	0.0000	0.0000
Te-131	25.000	m	0.40	9.3792E+10	1.1714E-03	0.4220	0.7210	0.0000
Br-84m	6.0000	m	3.33	2.0758E+10	1.0802E-03	2.7620	0.9100	0.0000
Br-84	31.800	m	0.25	1.0635E+11	1.0442E-03	1.7680	1.2360	0.0000
Te-133	12.450	m	2.41	3.5522E+10	8.9085E-04	0.9540	0.7970	0.0000
Xe-125m	56.000	s	5.36	1.8590E+09	6.2188E-04	0.1160	0.1370	0.0000
Te-133m	55.400	m	0.72	7.1319E+10	4.0195E-04	1.6960	0.6000	0.0000
Se-83	22.300	m	1.35	2.8137E+10	3.9395E-04	2.4290	0.4976	0.0000
Kr-79m	50.000	s	6.00	8.9339E+08	3.3473E-04	0.0408	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3640E+15	2.9621E-04	0.0022	0.2507	0.0000
I-128	24.980	m	0.08	2.1282E+10	2.6601E-04	0.0915	0.7380	0.0000
Xe-127	36.400	d	0.27	2.4614E+13	1.4662E-04	0.2710	0.0307	0.0000
Xe-127m	1.1600	m	1.29	3.6879E+08	9.9264E-05	0.1680	0.1290	0.0000
Br-82	1.4720	d	0.08	5.0663E+11	7.4626E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.6693E+12	7.2138E-05	0.3823	0.1920	0.0000
Te-127	9.3500	h	0.64	1.2577E+11	6.9999E-05	0.0050	0.2245	0.0000
I-125	59.410	d	0.02	1.7735E+13	6.4725E-05	0.0424	0.0179	0.0000
Te-131m	1.2500	d	0.64	1.5078E+11	2.6155E-05	1.4200	0.0523	0.0000
I-130m	8.8400	m	0.68	5.1649E+08	1.8242E-05	0.1210	0.1910	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 155
Total activity (Ci) = 6.17649E+06

Total number of decays = 2.53023E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 1.59386E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2841
Average beta E (MeV) = 0.46389
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0067539 R/hr per Ci/m2
Composite ECF per FGR table = 22.8240891 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0514240 Rem/hr per Ci/m2

Air Source

Point in time = 21.7695389 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.1088E+21	6.0064E+06	1.2840	0.4639	0.0000
S-37	4.9900	m	0.40	1.2702E+16	794.7	2.9310	0.7998	0.0000
Kr-83m	1.8300	h	1.09	2.5538E+17	726.2	0.0026	0.0382	0.0000
Ar-37	35.030	d	0.09	5.5004E+19	340.5	0.0002	0.0019	0.0000
N-13	9.9670	m	0.04	6.6034E+15	206.9	1.0200	0.0000	0.4909
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	5.0240E+15	5.834	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	8.3784E+14	3.428	0.7960	1.3380	0.0000
Xe-135m	15.290	m	0.33	4.7785E+13	0.9758	0.4320	0.0984	0.0000
Cl-38	37.200	m	0.27	9.1946E+13	0.7717	1.5110	1.5200	0.0000
Cl-39	55.600	m	0.36	1.0802E+14	0.6066	1.4500	0.8276	0.0000
Kr-79	1.4590	d	0.29	3.5134E+15	0.5221	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.5349E+15	0.4726	0.2690	0.0323	0.0013
Br-78	6.4600	m	0.62	8.0556E+12	0.3894	0.1120	0.0000	0.0000
Xe-137	3.8180	m	0.34	3.1259E+12	0.2556	0.1960	1.7030	0.0000
S-35	87.310	d	0.18	8.4170E+16	0.2090	0.0000	0.0486	0.0000
Br-83	2.4000	h	0.83	5.4268E+13	0.1177	0.0065	0.3249	0.0000
Se-81	18.450	m	0.65	6.8678E+12	0.1162	0.0080	0.6107	0.0000
Xe-135	9.1390	h	0.22	2.0339E+14	0.1158	0.2490	0.3190	0.0000
Cl-40	1.3500	m	1.48	3.9009E+11	9.0220E-02	4.0690	1.5290	0.0000
Xe-133m	2.1880	d	0.50	5.6469E+14	5.5959E-02	0.0414	0.1920	0.0000
Se-81m	57.280	m	0.03	8.8444E+12	4.8210E-02	0.0182	0.0002	0.0000
Xe-131m	11.930	d	0.13	2.4788E+15	4.5052E-02	0.0200	0.1430	0.0000
Se-79m	3.9000	m	0.51	3.5616E+11	2.8514E-02	0.0139	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6898E+14	2.3526E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.6294E+14	1.3745E-02	0.0513	0.1830	0.0000
Br-80	17.600	m	0.28	5.1117E+11	9.0683E-03	0.0800	0.7182	0.0081
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Te-129	1.1600	h	0.29	4.4732E+11	2.0067E-03	0.0631	0.5420	0.0000
Br-80m	4.4110	h	0.23	1.0466E+12	1.2347E-03	0.0240	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.3199E+10	1.1894E-03	0.0028	0.0306	0.0000
Te-131	25.000	m	0.40	8.3212E+10	1.0392E-03	0.4220	0.7210	0.0000
Br-84	31.800	m	0.25	9.6750E+10	9.4994E-04	1.7680	1.2360	0.0000
Te-133	12.450	m	2.41	2.8485E+10	7.1436E-04	0.9540	0.7970	0.0000
Br-84m	6.0000	m	3.33	1.2575E+10	6.5439E-04	2.7620	0.9100	0.0000
Te-133m	55.400	m	0.72	6.7551E+10	3.8071E-04	1.6960	0.6000	0.0000
Se-83	22.300	m	1.35	2.4587E+10	3.4425E-04	2.4290	0.4976	0.0000
Kr-85	10.750	y	0.21	5.3761E+15	2.9688E-04	0.0022	0.2507	0.0000
I-128	24.980	m	0.08	1.8868E+10	2.3584E-04	0.0915	0.7380	0.0000
Xe-127	36.400	d	0.27	2.4613E+13	1.4661E-04	0.2710	0.0307	0.0000
I-125	59.410	d	0.02	2.2293E+13	8.1361E-05	0.0424	0.0179	0.0000
Br-82	1.4720	d	0.08	5.2036E+11	7.6648E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.6794E+12	7.2412E-05	0.3823	0.1920	0.0000
Te-127	9.3500	h	0.64	1.2510E+11	6.9626E-05	0.0050	0.2245	0.0000
Te-131m	1.2500	d	0.64	1.5053E+11	2.6111E-05	1.4200	0.0523	0.0000
Xe-125m	56.000	s	5.36	7.4120E+07	2.4796E-05	0.1160	0.1370	0.0000
I-133	20.800	h	0.48	8.0909E+10	2.0242E-05	0.6080	0.4100	0.0000
Se-75	119.70	d	0.20	9.4102E+12	1.7046E-05	0.3889	0.0000	0.0000
I-130m	8.8400	m	0.68	3.6755E+08	1.2982E-05	0.1210	0.1910	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 155
Total activity (Ci) = 6.00867E+06

Total number of decays = 3.11701E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 1.96349E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2839
Average beta E (MeV) = 0.46386
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0043831 R/hr per Ci/m2
Composite ECF per FGR table = 22.8264275 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0493011 Rem/hr per Ci/m2

Air Source

Point in time = 27.1880074 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.0378E+21	5.8041E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.4680E+17	701.8	0.0026	0.0382	0.0000	0.0000
S-37	4.9900	m	0.40	5.9838E+15	374.4	2.9310	0.7998	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4999E+19	340.4	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
N-13	9.9670	m	0.04	4.5302E+15	141.9	1.0200	0.0000	0.4909	0.0000
Kr-85m	4.4810	h	0.18	4.9543E+15	5.753	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	7.9760E+14	3.263	0.7960	1.3380	0.0000	0.0000
Xe-135m	15.290	m	0.33	3.7377E+13	0.7633	0.4320	0.0984	0.0000	0.0000
Cl-38	37.200	m	0.27	8.3116E+13	0.6976	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	1.0096E+14	0.5670	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.5071E+15	0.5212	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5292E+15	0.4709	0.2690	0.0323	0.0013	0.0000
Br-78	6.4600	m	0.62	4.5041E+12	0.2177	0.1120	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	8.4167E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.1231E+14	0.1209	0.2490	0.3190	0.0000	0.0000
Br-83	2.4000	h	0.83	5.2875E+13	0.1146	0.0065	0.3249	0.0000	0.0000
Se-81	18.450	m	0.65	6.1099E+12	0.1034	0.0080	0.6107	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.1688E+12	9.5584E-02	0.1960	1.7030	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6402E+14	5.5893E-02	0.0414	0.1920	0.0000	0.0000
Se-81m	57.280	m	0.03	8.2831E+12	4.5150E-02	0.0182	0.0002	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4783E+15	4.5042E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6937E+14	2.3542E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6277E+14	1.3741E-02	0.0513	0.1830	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.3596E+11	1.0885E-02	0.0139	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	4.2622E+11	7.5612E-03	0.0800	0.7182	0.0081	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Cl-40	1.3500	m	1.48	2.4150E+10	5.5855E-03	4.0690	1.5290	0.0000	0.0000
Te-129	1.1600	h	0.29	4.2385E+11	1.9014E-03	0.0631	0.5420	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0318E+12	1.2173E-03	0.0240	0.0000	0.0000	0.0000
Te-131	25.000	m	0.40	7.1665E+10	8.9504E-04	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	8.5972E+10	8.4412E-04	1.7680	1.2360	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.2521E+10	6.4192E-04	0.0028	0.0306	0.0000	0.0000
Te-133	12.450	m	2.41	2.1735E+10	5.4507E-04	0.9540	0.7970	0.0000	0.0000
Te-133m	55.400	m	0.72	6.3123E+10	3.5576E-04	1.6960	0.6000	0.0000	0.0000
Br-84m	6.0000	m	3.33	6.7245E+09	3.4993E-04	2.7620	0.9100	0.0000	0.0000
Kr-85	10.750	y	0.21	5.3910E+15	2.9770E-04	0.0022	0.2507	0.0000	0.0000
Se-83	22.300	m	1.35	2.0776E+10	2.9089E-04	2.4290	0.4976	0.0000	0.0000
I-128	24.980	m	0.08	1.6234E+10	2.0291E-04	0.0915	0.7380	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4611E+13	1.4660E-04	0.2710	0.0307	0.0000	0.0000
I-125	59.410	d	0.02	2.7966E+13	1.0207E-04	0.0424	0.0179	0.0000	0.0000
Br-82	1.4720	d	0.08	5.2985E+11	7.8046E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.6904E+12	7.2709E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2427E+11	6.9163E-05	0.0050	0.2245	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.5022E+11	2.6057E-05	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	9.1826E+10	2.2973E-05	0.6080	0.4100	0.0000	0.0000
Se-75	119.70	d	0.20	9.4100E+12	1.7045E-05	0.3889	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	5.4180E+09	1.0761E-05	0.0018	0.5952	0.0000	0.0000
I-132m	1.3830	h	1.21	2.5539E+09	9.6094E-06	0.3190	0.1610	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 154
Total activity (Ci) = 5.80586E+06

Total number of decays = 3.82752E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 2.41106E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2838
Average beta E (MeV) = 0.46383
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0028019 R/hr per Ci/m2
Composite ECF per FGR table = 22.8279457 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0478897 Rem/hr per Ci/m2

Air Source

Point in time = 33.9551735 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
Ar-41	1.8270	h	0.36	1.9524E+21	5.5610E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.3648E+17	672.5	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4994E+19	340.4	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-37	4.9900	m	0.40	2.3374E+15	146.3	2.9310	0.7998	0.0000	0.0000
N-13	9.9670	m	0.04	2.8296E+15	88.64	1.0200	0.0000	0.4909	0.0000
Kr-85m	4.4810	h	0.18	4.8686E+15	5.654	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	7.5006E+14	3.069	0.7960	1.3380	0.0000	0.0000
Cl-38	37.200	m	0.27	7.3270E+13	0.6150	1.5110	1.5200	0.0000	0.0000
Xe-135m	15.290	m	0.33	2.7503E+13	0.5616	0.4320	0.0984	0.0000	0.0000
Cl-39	55.600	m	0.36	9.2796E+13	0.5211	1.4500	0.8276	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4993E+15	0.5200	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5222E+15	0.4687	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4164E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.2027E+14	0.1254	0.2490	0.3190	0.0000	0.0000
Br-83	2.4000	h	0.83	5.1184E+13	0.1110	0.0065	0.3249	0.0000	0.0000
Br-78	6.4600	m	0.62	2.1790E+12	0.1053	0.1120	0.0000	0.0000	0.0000
Se-81	18.450	m	0.65	5.3121E+12	8.9896E-02	0.0080	0.6107	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6318E+14	5.5809E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4776E+15	4.5030E-02	0.0200	0.1430	0.0000	0.0000
Se-81m	57.280	m	0.03	7.6318E+12	4.1600E-02	0.0182	0.0002	0.0000	0.0000
Xe-137	3.8180	m	0.34	3.4213E+11	2.7979E-02	0.1960	1.7030	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6985E+14	2.3562E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6256E+14	1.3736E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-80	17.600	m	0.28	3.4241E+11	6.0744E-03	0.0800	0.7182	0.0081	0.0000
Se-79m	3.9000	m	0.51	4.0839E+10	3.2695E-03	0.0139	0.0000	0.0000	0.0000
Te-129	1.1600	h	0.29	3.9626E+11	1.7776E-03	0.0631	0.5420	0.0000	0.0000
Br-80m	4.4110	h	0.23	1.0137E+12	1.1959E-03	0.0240	0.0000	0.0000	0.0000
Te-131	25.000	m	0.40	5.9480E+10	7.4286E-04	0.4220	0.7210	0.0000	0.0000
Br-84	31.800	m	0.25	7.4182E+10	7.2836E-04	1.7680	1.2360	0.0000	0.0000
Te-133	12.450	m	2.41	1.5657E+10	3.9265E-04	0.9540	0.7970	0.0000	0.0000
Te-133m	55.400	m	0.72	5.7999E+10	3.2688E-04	1.6960	0.6000	0.0000	0.0000
Kr-85	10.750	y	0.21	5.4093E+15	2.9871E-04	0.0022	0.2507	0.0000	0.0000
Br-82m	6.0900	m	1.15	5.7960E+09	2.9715E-04	0.0028	0.0306	0.0000	0.0000
Se-83	22.300	m	1.35	1.6835E+10	2.3571E-04	2.4290	0.4976	0.0000	0.0000
Cl-40	1.3500	m	1.48	7.4808E+08	1.7302E-04	4.0690	1.5290	0.0000	0.0000
I-128	24.980	m	0.08	1.3455E+10	1.6818E-04	0.0915	0.7380	0.0000	0.0000
Br-84m	6.0000	m	3.33	3.0771E+09	1.6013E-04	2.7620	0.9100	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4609E+13	1.4659E-04	0.2710	0.0307	0.0000	0.0000
I-125	59.410	d	0.02	3.5022E+13	1.2782E-04	0.0424	0.0179	0.0000	0.0000
Br-82	1.4720	d	0.08	5.3523E+11	7.8839E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7019E+12	7.3019E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2324E+11	6.8589E-05	0.0050	0.2245	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4983E+11	2.5989E-05	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	1.0266E+11	2.5684E-05	0.6080	0.4100	0.0000	0.0000
Se-75	119.70	d	0.20	9.4097E+12	1.7045E-05	0.3889	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	5.2587E+09	1.0445E-05	0.0018	0.5952	0.0000	0.0000
I-132m	1.3830	h	1.21	2.4135E+09	9.0813E-06	0.3190	0.1610	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 154
Total activity (Ci) = 5.56243E+06

Total number of decays = 4.68132E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 2.94890E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2838
Average beta E (MeV) = 0.46382
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0018711 R/hr per Ci/m2
Composite ECF per FGR table = 22.8287640 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0470734 Rem/hr per Ci/m2

Air Source

Point in time = 42.4066658 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.8508E+21	5.2716E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.2419E+17	637.5	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4988E+19	340.4	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
N-13	9.9670	m	0.04	1.5721E+15	49.25	1.0200	0.0000	0.4909	0.0000
S-37	4.9900	m	0.40	7.2258E+14	45.21	2.9310	0.7998	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.7637E+15	5.532	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	6.9464E+14	2.842	0.7960	1.3380	0.0000	0.0000
Cl-38	37.200	m	0.27	6.2594E+13	0.5254	1.5110	1.5200	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4895E+15	0.5186	0.2570	0.0053	0.0183	0.0000
Cl-39	55.600	m	0.36	8.3516E+13	0.4690	1.4500	0.8276	0.0000	0.0000
Xe-125	16.900	h	1.18	1.5134E+15	0.4660	0.2690	0.0323	0.0013	0.0000
Xe-135m	15.290	m	0.33	1.8749E+13	0.3829	0.4320	0.0984	0.0000	0.0000
S-35	87.310	d	0.18	8.4160E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.2658E+14	0.1290	0.2490	0.3190	0.0000	0.0000
Br-83	2.4000	h	0.83	4.9148E+13	0.1066	0.0065	0.3249	0.0000	0.0000
Se-81	18.450	m	0.65	4.5006E+12	7.6163E-02	0.0080	0.6107	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6213E+14	5.5706E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4768E+15	4.5015E-02	0.0200	0.1430	0.0000	0.0000
Br-78	6.4600	m	0.62	8.7989E+11	4.2527E-02	0.1120	0.0000	0.0000	0.0000
Se-81m	57.280	m	0.03	6.8899E+12	3.7556E-02	0.0182	0.0002	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.7046E+14	2.3587E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6231E+14	1.3730E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0862E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Xe-137	3.8180	m	0.34	7.3763E+10	6.0322E-03	0.1960	1.7030	0.0000	0.0000
Br-80	17.600	m	0.28	2.6433E+11	4.6893E-03	0.0800	0.7182	0.0081	0.0000
Te-129	1.1600	h	0.29	3.6431E+11	1.6343E-03	0.0631	0.5420	0.0000	0.0000
Br-80m	4.4110	h	0.23	9.9153E+11	1.1697E-03	0.0240	0.0000	0.0000	0.0000
Se-79m	3.9000	m	0.51	9.0934E+09	7.2801E-04	0.0139	0.0000	0.0000	0.0000
Br-84	31.800	m	0.25	6.1701E+10	6.0581E-04	1.7680	1.2360	0.0000	0.0000
Te-131	25.000	m	0.40	4.7146E+10	5.8881E-04	0.4220	0.7210	0.0000	0.0000
Kr-85	10.750	y	0.21	5.4317E+15	2.9995E-04	0.0022	0.2507	0.0000	0.0000
Te-133m	55.400	m	0.72	5.2179E+10	2.9408E-04	1.6960	0.6000	0.0000	0.0000
Te-133	12.450	m	2.41	1.0589E+10	2.6557E-04	0.9540	0.7970	0.0000	0.0000
Se-83	22.300	m	1.35	1.2946E+10	1.8126E-04	2.4290	0.4976	0.0000	0.0000
I-125	59.410	d	0.02	4.3788E+13	1.5981E-04	0.0424	0.0179	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4606E+13	1.4657E-04	0.2710	0.0307	0.0000	0.0000
I-128	24.980	m	0.08	1.0642E+10	1.3302E-04	0.0915	0.7380	0.0000	0.0000
Br-82m	6.0900	m	1.15	2.2150E+09	1.1356E-04	0.0028	0.0306	0.0000	0.0000
Br-82	1.4720	d	0.08	5.3724E+11	7.9136E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7133E+12	7.3329E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2196E+11	6.7880E-05	0.0050	0.2245	0.0000	0.0000
Br-84m	6.0000	m	3.33	1.1591E+09	6.0317E-05	2.7620	0.9100	0.0000	0.0000
I-133	20.800	h	0.48	1.1304E+11	2.8281E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4934E+11	2.5905E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70	d	0.20	9.4094E+12	1.7044E-05	0.3889	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	5.0663E+09	1.0063E-05	0.0018	0.5952	0.0000	0.0000
I-132m	1.3830	h	1.21	2.2490E+09	8.4623E-06	0.3190	0.1610	0.0000	0.0000
I-132	2.2950	h	0.57	3.3253E+09	7.5399E-06	2.2900	0.4940	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 153
Total activity (Ci) = 5.27287E+06

Total number of decays = 5.69755E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 3.58905E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.46381
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0013733 R/hr per Ci/m2
Composite ECF per FGR table = 22.8290768 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0466499 Rem/hr per Ci/m2

Air Source

Point in time = 52.9617386 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.7313E+21	4.9313E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.0974E+17	596.4	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4980E+19	340.3	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
N-13	9.9670	m	0.04	7.5454E+14	23.64	1.0200	0.0000	0.4909	0.0000
S-37	4.9900	m	0.40	1.6678E+14	10.44	2.9310	0.7998	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.6358E+15	5.384	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	6.3114E+14	2.582	0.7960	1.3380	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4774E+15	0.5168	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.5025E+15	0.4627	0.2690	0.0323	0.0013	0.0000
Cl-38	37.200	m	0.27	5.1419E+13	0.4316	1.5110	1.5200	0.0000	0.0000
Cl-39	55.600	m	0.36	7.3219E+13	0.4112	1.4500	0.8276	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.1619E+13	0.2373	0.4320	0.0984	0.0000	0.0000
S-35	87.310	d	0.18	8.4155E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.3061E+14	0.1313	0.2490	0.3190	0.0000	0.0000
Br-83	2.4000	h	0.83	4.6716E+13	0.1013	0.0065	0.3249	0.0000	0.0000
Se-81	18.450	m	0.65	3.7061E+12	6.2718E-02	0.0080	0.6107	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.6083E+14	5.5577E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4757E+15	4.4995E-02	0.0200	0.1430	0.0000	0.0000
Se-81m	57.280	m	0.03	6.0637E+12	3.3053E-02	0.0182	0.0002	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.7121E+14	2.3618E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6198E+14	1.3722E-02	0.0513	0.1830	0.0000	0.0000
Br-78	6.4600	m	0.62	2.8351E+11	1.3703E-02	0.1120	0.0000	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-80	17.600	m	0.28	1.9653E+11	3.4864E-03	0.0800	0.7182	0.0081	0.0000
Te-129	1.1600	h	0.29	3.2801E+11	1.4715E-03	0.0631	0.5420	0.0000	0.0000
Br-80m	4.4110	h	0.23	9.6449E+11	1.1378E-03	0.0240	0.0000	0.0000	0.0000
Xe-137	3.8180	m	0.34	1.0855E+10	8.8768E-04	0.1960	1.7030	0.0000	0.0000
Br-84	31.800	m	0.25	4.9020E+10	4.8131E-04	1.7680	1.2360	0.0000	0.0000
Te-131	25.000	m	0.40	3.5295E+10	4.4080E-04	0.4220	0.7210	0.0000	0.0000
Kr-85	10.750	y	0.21	5.4591E+15	3.0146E-04	0.0022	0.2507	0.0000	0.0000
Te-133m	55.400	m	0.72	4.5724E+10	2.5769E-04	1.6960	0.6000	0.0000	0.0000
I-125	59.410	d	0.02	5.4664E+13	1.9950E-04	0.0424	0.0179	0.0000	0.0000
Te-133	12.450	m	2.41	6.7326E+09	1.6884E-04	0.9540	0.7970	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4603E+13	1.4655E-04	0.2710	0.0307	0.0000	0.0000
Se-83	22.300	m	1.35	9.3248E+09	1.3056E-04	2.4290	0.4976	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.3932E+09	1.1154E-04	0.0139	0.0000	0.0000	0.0000
I-128	24.980	m	0.08	7.9403E+09	9.9247E-05	0.0915	0.7380	0.0000	0.0000
Br-82	1.4720	d	0.08	5.3690E+11	7.9085E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7240E+12	7.3619E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.2039E+11	6.7003E-05	0.0050	0.2245	0.0000	0.0000
Br-82m	6.0900	m	1.15	6.6624E+08	3.4157E-05	0.0028	0.0306	0.0000	0.0000
I-133	20.800	h	0.48	1.2266E+11	3.0688E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4874E+11	2.5800E-05	1.4200	0.0523	0.0000	0.0000
Br-84m	6.0000	m	3.33	3.4241E+08	1.7819E-05	2.7620	0.9100	0.0000	0.0000
Se-75	119.70	d	0.20	9.4090E+12	1.7044E-05	0.3889	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	4.8359E+09	9.6051E-06	0.0018	0.5952	0.0000	0.0000
I-132m	1.3830	h	1.21	2.0592E+09	7.7481E-06	0.3190	0.1610	0.0000	0.0000
I-132	2.2950	h	0.57	3.3123E+09	7.5105E-06	2.2900	0.4940	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 152
Total activity (Ci) = 4.93241E+06

Total number of decays = 6.89277E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 4.34195E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.46380
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0010872 R/hr per Ci/m2
Composite ECF per FGR table = 22.8290901 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0464268 Rem/hr per Ci/m2

Air Source

Point in time = 1.10240090 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.5929E+21	4.5369E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	1.9300E+17	548.8	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4970E+19	340.2	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
N-13	9.9670	m	0.04	3.0167E+14	9.450	1.0200	0.0000	0.4909	0.0000
Kr-85m	4.4810	h	0.18	4.4809E+15	5.204	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	5.5993E+14	2.291	0.7960	1.3380	0.0000	0.0000
S-37	4.9900	m	0.40	2.6723E+13	1.672	2.9310	0.7998	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4623E+15	0.5145	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.4890E+15	0.4585	0.2690	0.0323	0.0013	0.0000
Cl-39	55.600	m	0.36	6.2123E+13	0.3489	1.4500	0.8276	0.0000	0.0000
Cl-38	37.200	m	0.27	4.0220E+13	0.3376	1.5110	1.5200	0.0000	0.0000
S-35	87.310	d	0.18	8.4149E+16	0.2090	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.3195E+14	0.1321	0.2490	0.3190	0.0000	0.0000
Xe-135m	15.290	m	0.33	6.3921E+12	0.1305	0.4320	0.0984	0.0000	0.0000
Br-83	2.4000	h	0.83	4.3847E+13	9.5072E-02	0.0065	0.3249	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.5920E+14	5.5416E-02	0.0414	0.1920	0.0000	0.0000
Se-81	18.450	m	0.65	2.9587E+12	5.0070E-02	0.0080	0.6107	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4744E+15	4.4971E-02	0.0200	0.1430	0.0000	0.0000
Se-81m	57.280	m	0.03	5.1696E+12	2.8179E-02	0.0182	0.0002	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.7214E+14	2.3656E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.6158E+14	1.3712E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000	0.0000
Br-78	6.4600	m	0.62	6.8911E+10	3.3307E-03	0.1120	0.0000	0.0000	0.0000
Br-80	17.600	m	0.28	1.4243E+11	2.5267E-03	0.0800	0.7182	0.0081	0.0000
Te-129	1.1600	h	0.29	2.8772E+11	1.2907E-03	0.0631	0.5420	0.0000	0.0000
Br-80m	4.4110	h	0.23	9.3176E+11	1.0992E-03	0.0240	0.0000	0.0000	0.0000
Br-84	31.800	m	0.25	3.6778E+10	3.6110E-04	1.7680	1.2360	0.0000	0.0000
Te-131	25.000	m	0.40	2.4622E+10	3.0751E-04	0.4220	0.7210	0.0000	0.0000
Kr-85	10.750	y	0.21	5.4922E+15	3.0329E-04	0.0022	0.2507	0.0000	0.0000
I-125	59.410	d	0.02	6.8136E+13	2.4867E-04	0.0424	0.0179	0.0000	0.0000
Te-133m	55.400	m	0.72	3.8772E+10	2.1851E-04	1.6960	0.6000	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4599E+13	1.4653E-04	0.2710	0.0307	0.0000	0.0000
Te-133	12.450	m	2.41	4.0852E+09	1.0245E-04	0.9540	0.7970	0.0000	0.0000
Se-83	22.300	m	1.35	6.1900E+09	8.6668E-05	2.4290	0.4976	0.0000	0.0000
Xe-137	3.8180	m	0.34	9.9143E+08	8.1077E-05	0.1960	1.7030	0.0000	0.0000
Br-82	1.4720	d	0.08	5.3510E+11	7.8819E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7333E+12	7.3869E-05	0.3823	0.1920	0.0000	0.0000
I-128	24.980	m	0.08	5.5078E+09	6.8843E-05	0.0915	0.7380	0.0000	0.0000
Te-127	9.3500	h	0.64	1.1845E+11	6.5925E-05	0.0050	0.2245	0.0000	0.0000
I-133	20.800	h	0.48	1.3133E+11	3.2856E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4798E+11	2.5669E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70	d	0.20	9.4085E+12	1.7043E-05	0.3889	0.0000	0.0000	0.0000
Se-79m	3.9000	m	0.51	1.3382E+08	1.0713E-05	0.0139	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	4.5629E+09	9.0627E-06	0.0018	0.5952	0.0000	0.0000
Br-82m	6.0900	m	1.15	1.4860E+08	7.6187E-06	0.0028	0.0306	0.0000	0.0000
I-132	2.2950	h	0.57	3.2784E+09	7.4336E-06	2.2900	0.4940	0.0000	0.0000
I-132m	1.3830	h	1.21	1.8445E+09	6.9402E-06	0.3190	0.1610	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228204D+24

Total number of nuclides = 150
Total activity (Ci) = 4.53797E+06

Total number of decays = 8.27771E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 5.21436E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.46380
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0008411 R/hr per Ci/m2
Composite ECF per FGR table = 22.8289337 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0462532 Rem/hr per Ci/m2

Air Source

Point in time = 1.37679005 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h	0.36	1.4354E+21	4.0883E+06	1.2840	0.4639	0.0000
Kr-83m	1.8300 h	1.09	1.7395E+17	494.6	0.0026	0.0382	0.0000
Ar-37	35.030 d	0.09	5.4958E+19	340.2	0.0002	0.0019	0.0000
C-14	5701.1 y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810 h	0.18	4.2947E+15	4.987	0.1570	0.2282	0.0000
N-13	9.9670 m	0.04	9.6007E+13	3.008	1.0200	0.0000	0.4909
Kr-87	1.2720 h	0.79	4.8217E+14	1.973	0.7960	1.3380	0.0000
Kr-79	1.4590 d	0.29	3.4436E+15	0.5118	0.2570	0.0053	0.0183
Xe-125	16.900 h	1.18	1.4724E+15	0.4534	0.2690	0.0323	0.0013
Cl-39	55.600 m	0.36	5.0596E+13	0.2841	1.4500	0.8276	0.0000
Cl-38	37.200 m	0.27	2.9595E+13	0.2484	1.5110	1.5200	0.0000
S-35	87.310 d	0.18	8.4142E+16	0.2090	0.0000	0.0486	0.0000
S-37	4.9900 m	0.40	2.7146E+12	0.1699	2.9310	0.7998	0.0000
Xe-135	9.1390 h	0.22	2.3048E+14	0.1312	0.2490	0.3190	0.0000
Br-83	2.4000 h	0.83	4.0509E+13	8.7834E-02	0.0065	0.3249	0.0000
Xe-135m	15.290 m	0.33	3.0305E+12	6.1884E-02	0.4320	0.0984	0.0000
Xe-133m	2.1880 d	0.50	5.5718E+14	5.5215E-02	0.0414	0.1920	0.0000
Xe-131m	11.930 d	0.13	2.4727E+15	4.4942E-02	0.0200	0.1430	0.0000
Se-81	18.450 m	0.65	2.2829E+12	3.8634E-02	0.0080	0.6107	0.0000
Xe-133	5.2440 d	0.08	5.7330E+14	2.3704E-02	0.0463	0.1360	0.0000
Se-81m	57.280 m	0.03	4.2358E+12	2.3089E-02	0.0182	0.0002	0.0000
Xe-129m	8.8800 d	0.23	5.6108E+14	1.3700E-02	0.0513	0.1830	0.0000
Ar-39	269.01 y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000
H-3	12.330 y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-80	17.600 m	0.28	1.0334E+11	1.8333E-03	0.0800	0.7182	0.0081
Te-129	1.1600 h	0.29	2.4429E+11	1.0959E-03	0.0631	0.5420	0.0000
Br-80m	4.4110 h	0.23	8.9244E+11	1.0528E-03	0.0240	0.0000	0.0000
Br-78	6.4600 m	0.62	1.1779E+10	5.6931E-04	0.1120	0.0000	0.0000
I-125	59.410 d	0.02	8.4790E+13	3.0945E-04	0.0424	0.0179	0.0000
Kr-85	10.750 y	0.21	5.5321E+15	3.0549E-04	0.0022	0.2507	0.0000
Br-84	31.800 m	0.25	2.5689E+10	2.5222E-04	1.7680	1.2360	0.0000
Te-131	25.000 m	0.40	1.5756E+10	1.9678E-04	0.4220	0.7210	0.0000
Te-133m	55.400 m	0.72	3.1554E+10	1.7784E-04	1.6960	0.6000	0.0000
Xe-127	36.400 d	0.27	2.4593E+13	1.4650E-04	0.2710	0.0307	0.0000
Br-82	1.4720 d	0.08	5.3234E+11	7.8414E-05	2.6600	0.1439	0.0000
I-131	8.0230 d	0.02	2.7404E+12	7.4061E-05	0.3823	0.1920	0.0000
Te-127	9.3500 h	0.64	1.1608E+11	6.4602E-05	0.0050	0.2245	0.0000
Te-133	12.450 m	2.41	2.4478E+09	6.1387E-05	0.9540	0.7970	0.0000
Se-83	22.300 m	1.35	3.7107E+09	5.1954E-05	2.4290	0.4976	0.0000
I-128	24.980 m	0.08	3.4880E+09	4.3598E-05	0.0915	0.7380	0.0000
I-133	20.800 h	0.48	1.3895E+11	3.4762E-05	0.6080	0.4100	0.0000
Te-131m	1.2500 d	0.64	1.4705E+11	2.5507E-05	1.4200	0.0523	0.0000
Se-75	119.70 d	0.20	9.4079E+12	1.7041E-05	0.3889	0.0000	0.0000
Si-31	2.6200 h	0.38	4.2434E+09	8.4281E-06	0.0018	0.5952	0.0000
I-132	2.2950 h	0.57	3.2133E+09	7.2861E-06	2.2900	0.4940	0.0000
Cl-36	0.30101E+06 y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
I-132m	1.3830 h	1.21	1.6075E+09	6.0485E-06	0.3190	0.1610	0.0000
I-124	4.1760 d	0.01	8.4373E+10	4.3808E-06	1.0900	0.0065	0.1880
Xe-137	3.8180 m	0.34	4.9913E+07	4.0818E-06	0.1960	1.7030	0.0000
Te-129m	33.600 d	0.30	5.5484E+11	3.5805E-06	0.0373	0.2660	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 150
Total activity (Ci) = 4.08936E+06

Total number of decays = 9.85287E+20
Asympt number of decays = 1.58748E+24
Percent of decays = 6.20660E-02
Average chain length = 1.0060

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.46379
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0005436 R/hr per Ci/m2
Composite ECF per FGR table = 22.8286648 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0460529 Rem/hr per Ci/m2

Air Source

Point in time = 1.71947491 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.2604E+21	3.5899E+06	1.2840	0.4639	0.0000
Kr-83m	1.8300	h	1.09	1.5278E+17	434.4	0.0026	0.0382	0.0000
Ar-37	35.030	d	0.09	5.4942E+19	340.1	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	4.0729E+15	4.730	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	4.0003E+14	1.637	0.7960	1.3380	0.0000
N-13	9.9670	m	0.04	2.2977E+13	0.7198	1.0200	0.0000	0.4909
Kr-79	1.4590	d	0.29	3.4203E+15	0.5083	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.4518E+15	0.4470	0.2690	0.0323	0.0013
Cl-39	55.600	m	0.36	3.9156E+13	0.2199	1.4500	0.8276	0.0000
S-35	87.310	d	0.18	8.4132E+16	0.2089	0.0000	0.0486	0.0000
Cl-38	37.200	m	0.27	2.0176E+13	0.1693	1.5110	1.5200	0.0000
Xe-135	9.1390	h	0.22	2.2636E+14	0.1289	0.2490	0.3190	0.0000
Br-83	2.4000	h	0.83	3.6693E+13	7.9561E-02	0.0065	0.3249	0.0000
Xe-133m	2.1880	d	0.50	5.5467E+14	5.4966E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4707E+15	4.4904E-02	0.0200	0.1430	0.0000
Se-81	18.450	m	0.65	1.6938E+12	2.8664E-02	0.0080	0.6107	0.0000
Xe-135m	15.290	m	0.33	1.1932E+12	2.4365E-02	0.4320	0.0984	0.0000
Xe-133	5.2440	d	0.08	5.7473E+14	2.3764E-02	0.0463	0.1360	0.0000
Se-81m	57.280	m	0.03	3.3028E+12	1.8003E-02	0.0182	0.0002	0.0000
Xe-129m	8.8800	d	0.23	5.6046E+14	1.3685E-02	0.0513	0.1830	0.0000
S-37	4.9900	m	0.40	1.5607E+11	9.7657E-03	2.9310	0.7998	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7885E-03	0.0000	0.0057	0.0000
Br-80	17.600	m	0.28	7.7938E+10	1.3826E-03	0.0800	0.7182	0.0081
Br-80m	4.4110	h	0.23	8.4566E+11	9.9765E-04	0.0240	0.0000	0.0000
Te-129	1.1600	h	0.29	1.9915E+11	8.9337E-04	0.0631	0.5420	0.0000
I-125	59.410	d	0.02	1.0532E+14	3.8439E-04	0.0424	0.0179	0.0000
Kr-85	10.750	y	0.21	5.5795E+15	3.0811E-04	0.0022	0.2507	0.0000
Br-84	31.800	m	0.25	1.6410E+10	1.6112E-04	1.7680	1.2360	0.0000
Xe-127	36.400	d	0.27	2.4587E+13	1.4646E-04	0.2710	0.0307	0.0000
Te-133m	55.400	m	0.72	2.4397E+10	1.3750E-04	1.6960	0.6000	0.0000
Te-131	25.000	m	0.40	9.0954E+09	1.1359E-04	0.4220	0.7210	0.0000
Br-82	1.4720	d	0.08	5.2880E+11	7.7892E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.7448E+12	7.4181E-05	0.3823	0.1920	0.0000
Te-127	9.3500	h	0.64	1.1317E+11	6.2988E-05	0.0050	0.2245	0.0000
Br-78	6.4600	m	0.62	1.2971E+09	6.2694E-05	0.1120	0.0000	0.0000
Te-133	12.450	m	2.41	1.5072E+09	3.7799E-05	0.9540	0.7970	0.0000
I-133	20.800	h	0.48	1.4542E+11	3.6381E-05	0.6080	0.4100	0.0000
Se-83	22.300	m	1.35	1.9584E+09	2.7420E-05	2.4290	0.4976	0.0000
Te-131m	1.2500	d	0.64	1.4589E+11	2.5306E-05	1.4200	0.0523	0.0000
I-128	24.980	m	0.08	1.9715E+09	2.4642E-05	0.0915	0.7380	0.0000
Se-75	119.70	d	0.20	9.4071E+12	1.7040E-05	0.3889	0.0000	0.0000
Si-31	2.6200	h	0.38	3.8756E+09	7.6976E-06	0.0018	0.5952	0.0000
I-132	2.2950	h	0.57	3.1047E+09	7.0397E-06	2.2900	0.4940	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
I-132m	1.3830	h	1.21	1.3538E+09	5.0940E-06	0.3190	0.1610	0.0000
I-124	4.1760	d	0.01	8.4173E+10	4.3704E-06	1.0900	0.0065	0.1880
Te-129m	33.600	d	0.30	5.5468E+11	3.5794E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 149
Total activity (Ci) = 3.59087E+06

Total number of decays = 1.16033E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 7.30922E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.46379
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 24.0001316 R/hr per Ci/m2
Composite ECF per FGR table = 22.8282719 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0457745 Rem/hr per Ci/m2

Air Source

Point in time = 2.14745688 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.0715E+21	3.0519E+06	1.2840	0.4639	0.0000	0.0000
Kr-83m	1.8300	h	1.09	1.2992E+17	369.4	0.0026	0.0382	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4923E+19	340.0	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-85m	4.4810	h	0.18	3.8120E+15	4.427	0.1570	0.2282	0.0000	0.0000
Kr-87	1.2720	h	0.79	3.1682E+14	1.296	0.7960	1.3380	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.3914E+15	0.5040	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.4266E+15	0.4393	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4120E+16	0.2089	0.0000	0.0486	0.0000	0.0000
Cl-39	55.600	m	0.36	2.8429E+13	0.1596	1.4500	0.8276	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.1993E+14	0.1252	0.2490	0.3190	0.0000	0.0000
N-13	9.9670	m	0.04	3.8524E+12	0.1207	1.0200	0.0000	0.4909	0.0000
Cl-38	37.200	m	0.27	1.2504E+13	0.1049	1.5110	1.5200	0.0000	0.0000
Br-83	2.4000	h	0.83	3.2428E+13	7.0312E-02	0.0065	0.3249	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.5154E+14	5.4656E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4681E+15	4.4858E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.7650E+14	2.3837E-02	0.0463	0.1360	0.0000	0.0000
Se-81	18.450	m	0.65	1.1973E+12	2.0262E-02	0.0080	0.6107	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.5968E+14	1.3666E-02	0.0513	0.1830	0.0000	0.0000
Se-81m	57.280	m	0.03	2.4206E+12	1.3195E-02	0.0182	0.0002	0.0000	0.0000
Xe-135m	15.290	m	0.33	3.7251E+11	7.6068E-03	0.4320	0.0984	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7884E-03	0.0000	0.0057	0.0000	0.0000
Br-80	17.600	m	0.28	6.2761E+10	1.1134E-03	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	7.9065E+11	9.3276E-04	0.0240	0.0000	0.0000	0.0000
Te-129	1.1600	h	0.29	1.5432E+11	6.9229E-04	0.0631	0.5420	0.0000	0.0000
I-125	59.410	d	0.02	1.3056E+14	4.7650E-04	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750	y	0.21	5.6353E+15	3.1119E-04	0.0022	0.2507	0.0000	0.0000
S-37	4.9900	m	0.40	4.4076E+09	2.7579E-04	2.9310	0.7998	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4578E+13	1.4641E-04	0.2710	0.0307	0.0000	0.0000
Te-133m	55.400	m	0.72	1.7693E+10	9.9715E-05	1.6960	0.6000	0.0000	0.0000
Br-84	31.800	m	0.25	9.3760E+09	9.2058E-05	1.7680	1.2360	0.0000	0.0000
Br-82	1.4720	d	0.08	5.2438E+11	7.7241E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7465E+12	7.4225E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	1.0965E+11	6.1029E-05	0.0050	0.2245	0.0000	0.0000
Te-131	25.000	m	0.40	4.6784E+09	5.8429E-05	0.4220	0.7210	0.0000	0.0000
I-133	20.800	h	0.48	1.5055E+11	3.7666E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4445E+11	2.5057E-05	1.4200	0.0523	0.0000	0.0000
Te-133	12.450	m	2.41	9.6207E+08	2.4127E-05	0.9540	0.7970	0.0000	0.0000
Se-75	119.70	d	0.20	9.4061E+12	1.7038E-05	0.3889	0.0000	0.0000	0.0000
Se-83	22.300	m	1.35	8.8156E+08	1.2343E-05	2.4290	0.4976	0.0000	0.0000
I-128	24.980	m	0.08	9.6683E+08	1.2085E-05	0.0915	0.7380	0.0000	0.0000
Si-31	2.6200	h	0.38	3.4607E+09	6.8736E-06	0.0018	0.5952	0.0000	0.0000
I-132	2.2950	h	0.57	2.9390E+09	6.6640E-06	2.2900	0.4940	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
I-124	4.1760	d	0.01	8.3924E+10	4.3575E-06	1.0900	0.0065	0.1880	0.0000
I-132m	1.3830	h	1.21	1.0925E+09	4.1106E-06	0.3190	0.1610	0.0000	0.0000
Br-78	6.4600	m	0.62	8.2484E+07	3.9867E-06	0.1120	0.0000	0.0000	0.0000
Te-129m	33.600	d	0.30	5.5448E+11	3.5781E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 149
Total activity (Ci) = 3.05276E+06

Total number of decays = 1.34928E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 8.49948E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2836
Average beta E (MeV) = 0.46377
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9995327 R/hr per Ci/m2
Composite ECF per FGR table = 22.8277016 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0453758 Rem/hr per Ci/m2

Air Source

Point in time = 2.68196177 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	8.7481E+20	2.4917E+06	1.2840	0.4639	0.0000
Ar-37	35.030	d	0.09	5.4898E+19	339.8	0.0002	0.0019	0.0000
Kr-83m	1.8300	h	1.09	1.0611E+17	301.7	0.0026	0.0382	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	3.5095E+15	4.076	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	2.3676E+14	0.9686	0.7960	1.3380	0.0000
Kr-79	1.4590	d	0.29	3.3557E+15	0.4987	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.3956E+15	0.4297	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4105E+16	0.2089	0.0000	0.0486	0.0000
Xe-135	9.1390	h	0.22	2.1147E+14	0.1204	0.2490	0.3190	0.0000
Cl-39	55.600	m	0.36	1.9060E+13	0.1070	1.4500	0.8276	0.0000
Br-83	2.4000	h	0.83	2.7790E+13	6.0255E-02	0.0065	0.3249	0.0000
Cl-38	37.200	m	0.27	6.8789E+12	5.7736E-02	1.5110	1.5200	0.0000
Xe-133m	2.1880	d	0.50	5.4766E+14	5.4272E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4649E+15	4.4800E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.7868E+14	2.3927E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.5871E+14	1.3642E-02	0.0513	0.1830	0.0000
Se-81	18.450	m	0.65	7.9413E+11	1.3439E-02	0.0080	0.6107	0.0000
N-13	9.9670	m	0.04	4.1412E+11	1.2973E-02	1.0200	0.0000	0.4909
Se-81m	57.280	m	0.03	1.6421E+12	8.9507E-03	0.0182	0.0002	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7884E-03	0.0000	0.0057	0.0000
Xe-135m	15.290	m	0.33	8.7044E+10	1.7775E-03	0.4320	0.0984	0.0000
Br-80	17.600	m	0.28	5.3607E+10	9.5100E-04	0.0800	0.7182	0.0081
Br-80m	4.4110	h	0.23	7.2696E+11	8.5762E-04	0.0240	0.0000	0.0000
I-125	59.410	d	0.02	1.6146E+14	5.8926E-04	0.0424	0.0179	0.0000
Te-129	1.1600	h	0.29	1.1227E+11	5.0363E-04	0.0631	0.5420	0.0000
Kr-85	10.750	y	0.21	5.7000E+15	3.1477E-04	0.0022	0.2507	0.0000
Xe-127	36.400	d	0.27	2.4568E+13	1.4634E-04	0.2710	0.0307	0.0000
Br-82	1.4720	d	0.08	5.1891E+11	7.6435E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.7455E+12	7.4198E-05	0.3823	0.1920	0.0000
Te-133m	55.400	m	0.72	1.1845E+10	6.6757E-05	1.6960	0.6000	0.0000
Te-127	9.3500	h	0.64	1.0541E+11	5.8668E-05	0.0050	0.2245	0.0000
Br-84	31.800	m	0.25	4.6604E+09	4.5759E-05	1.7680	1.2360	0.0000
I-133	20.800	h	0.48	1.5404E+11	3.8537E-05	0.6080	0.4100	0.0000
Te-131	25.000	m	0.40	2.1692E+09	2.7092E-05	0.4220	0.7210	0.0000
Te-131m	1.2500	d	0.64	1.4268E+11	2.4749E-05	1.4200	0.0523	0.0000
Se-75	119.70	d	0.20	9.4049E+12	1.7036E-05	0.3889	0.0000	0.0000
Te-133	12.450	m	2.41	6.1170E+08	1.5340E-05	0.9540	0.7970	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
I-132	2.2950	h	0.57	2.7045E+09	6.1323E-06	2.2900	0.4940	0.0000
Si-31	2.6200	h	0.38	3.0043E+09	5.9672E-06	0.0018	0.5952	0.0000
I-128	24.980	m	0.08	3.9708E+08	4.9631E-06	0.0915	0.7380	0.0000
Se-83	22.300	m	1.35	3.2534E+08	4.5551E-06	2.4290	0.4976	0.0000
I-124	4.1760	d	0.01	8.3615E+10	4.3414E-06	1.0900	0.0065	0.1880
Te-129m	33.600	d	0.30	5.5422E+11	3.5765E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000
S-37	4.9900	m	0.40	5.1229E+07	3.2054E-06	2.9310	0.7998	0.0000
I-132m	1.3830	h	1.21	8.3572E+08	3.1446E-06	0.3190	0.1610	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0351E-06	0.5990	0.0652	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 148
Total activity (Ci) = 2.49253E+06

Total number of decays = 1.54601E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 9.73872E-02
Average chain length = 1.0000

Average gamma E (MeV) = 1.2836
Average beta E (MeV) = 0.46376
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9986382 R/hr per Ci/m2
Composite ECF per FGR table = 22.8268528 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0447788 Rem/hr per Ci/m2

Air Source

Point in time = 3.34950924 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	6.7909E+20	1.9342E+06	1.2840	0.4639	0.0000
Ar-37	35.030	d	0.09	5.4868E+19	339.6	0.0002	0.0019	0.0000
Kr-83m	1.8300	h	1.09	8.2411E+16	234.3	0.0026	0.0382	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-85m	4.4810	h	0.18	3.1652E+15	3.676	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	1.6456E+14	0.6732	0.7960	1.3380	0.0000
Kr-79	1.4590	d	0.29	3.3117E+15	0.4922	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.3579E+15	0.4181	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.4087E+16	0.2088	0.0000	0.0486	0.0000
Xe-135	9.1390	h	0.22	2.0110E+14	0.1145	0.2490	0.3190	0.0000
Cl-39	55.600	m	0.36	1.1568E+13	6.4964E-02	1.4500	0.8276	0.0000
Xe-133m	2.1880	d	0.50	5.4286E+14	5.3796E-02	0.0414	0.1920	0.0000
Br-83	2.4000	h	0.83	2.2917E+13	4.9690E-02	0.0065	0.3249	0.0000
Xe-131m	11.930	d	0.13	2.4610E+15	4.4728E-02	0.0200	0.1430	0.0000
Cl-38	37.200	m	0.27	3.2614E+12	2.7374E-02	1.5110	1.5200	0.0000
Xe-133	5.2440	d	0.08	5.8136E+14	2.4038E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.5749E+14	1.3612E-02	0.0513	0.1830	0.0000
Se-81	18.450	m	0.65	4.8346E+11	8.1816E-03	0.0080	0.6107	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7884E-03	0.0000	0.0057	0.0000
Se-81m	57.280	m	0.03	1.0113E+12	5.5127E-03	0.0182	0.0002	0.0000
Br-80	17.600	m	0.28	4.7005E+10	8.3389E-04	0.0800	0.7182	0.0081
N-13	9.9670	m	0.04	2.5552E+10	8.0044E-04	1.0200	0.0000	0.4909
Br-80m	4.4110	h	0.23	6.5456E+11	7.7221E-04	0.0240	0.0000	0.0000
I-125	59.410	d	0.02	1.9909E+14	7.2661E-04	0.0424	0.0179	0.0000
Te-129	1.1600	h	0.29	7.5503E+10	3.3871E-04	0.0631	0.5420	0.0000
Kr-85	10.750	y	0.21	5.7737E+15	3.1883E-04	0.0022	0.2507	0.0000
Xe-135m	15.290	m	0.33	1.4164E+10	2.8923E-04	0.4320	0.0984	0.0000
Xe-127	36.400	d	0.27	2.4555E+13	1.4627E-04	0.2710	0.0307	0.0000
Br-82	1.4720	d	0.08	5.1216E+11	7.5440E-05	2.6600	0.1439	0.0000
I-131	8.0230	d	0.02	2.7422E+12	7.4110E-05	0.3823	0.1920	0.0000
Te-127	9.3500	h	0.64	1.0034E+11	5.5847E-05	0.0050	0.2245	0.0000
Te-133m	55.400	m	0.72	7.1763E+09	4.0445E-05	1.6960	0.6000	0.0000
I-133	20.800	h	0.48	1.5550E+11	3.8904E-05	0.6080	0.4100	0.0000
Te-131m	1.2500	d	0.64	1.4050E+11	2.4370E-05	1.4200	0.0523	0.0000
Br-84	31.800	m	0.25	1.9466E+09	1.9113E-05	1.7680	1.2360	0.0000
Se-75	119.70	d	0.20	9.4034E+12	1.7033E-05	0.3889	0.0000	0.0000
Te-131	25.000	m	0.40	9.9107E+08	1.2378E-05	0.4220	0.7210	0.0000
Te-133	12.450	m	2.41	3.6520E+08	9.1587E-06	0.9540	0.7970	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
I-132	2.2950	h	0.57	2.3953E+09	5.4313E-06	2.2900	0.4940	0.0000
Si-31	2.6200	h	0.38	2.5180E+09	5.0012E-06	0.0018	0.5952	0.0000
I-124	4.1760	d	0.01	8.3229E+10	4.3214E-06	1.0900	0.0065	0.1880
Te-129m	33.600	d	0.30	5.5390E+11	3.5744E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0351E-06	0.5990	0.0652	0.0000
I-132m	1.3830	h	1.21	5.9808E+08	2.2504E-06	0.3190	0.1610	0.0000
I-128	24.980	m	0.08	1.3068E+08	1.6334E-06	0.0915	0.7380	0.0000
Se-83	22.300	m	1.35	9.3682E+07	1.3117E-06	2.4290	0.4976	0.0000
I-130	12.360	h	0.08	3.1065E+09	1.3079E-06	2.1400	0.2960	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228204D+24

Total number of nuclides = 148
Total activity (Ci) = 1.93498E+06

Total number of decays = 1.74180E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.10972
Average chain length = 1.0000

Average gamma E (MeV) = 1.2835
Average beta E (MeV) = 0.46373
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9972305 R/hr per Ci/m2
Composite ECF per FGR table = 22.8255177 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0438385 Rem/hr per Ci/m2

Air Source

Point in time = 4.18320704 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	4.9495E+20	1.4097E+06	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4831E+19	339.4	0.0002	0.0019	0.0000	0.0000
Kr-83m	1.8300	h	1.09	6.0100E+16	170.9	0.0026	0.0382	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-85m	4.4810	h	0.18	2.7823E+15	3.231	0.1570	0.2282	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.2575E+15	0.4841	0.2570	0.0053	0.0183	0.0000
Kr-87	1.2720	h	0.79	1.0448E+14	0.4274	0.7960	1.3380	0.0000	0.0000
Xe-125	16.900	h	1.18	1.3123E+15	0.4041	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.4064E+16	0.2088	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.8879E+14	0.1075	0.2490	0.3190	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.3692E+14	5.3207E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4560E+15	4.4637E-02	0.0200	0.1430	0.0000	0.0000
Br-83	2.4000	h	0.83	1.8013E+13	3.9057E-02	0.0065	0.3249	0.0000	0.0000
Cl-39	55.600	m	0.36	6.2008E+12	3.4821E-02	1.4500	0.8276	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.8462E+14	2.4173E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.5598E+14	1.3576E-02	0.0513	0.1830	0.0000	0.0000
Cl-38	37.200	m	0.27	1.2841E+12	1.0778E-02	1.5110	1.5200	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7883E-03	0.0000	0.0057	0.0000	0.0000
Se-81	18.450	m	0.65	2.6267E+11	4.4452E-03	0.0080	0.6107	0.0000	0.0000
Se-81m	57.280	m	0.03	5.5209E+11	3.0094E-03	0.0182	0.0002	0.0000	0.0000
I-125	59.410	d	0.02	2.4465E+14	8.9289E-04	0.0424	0.0179	0.0000	0.0000
Br-80	17.600	m	0.28	4.0956E+10	7.2658E-04	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	5.7419E+11	6.7739E-04	0.0240	0.0000	0.0000	0.0000
Kr-85	10.750	y	0.21	5.8556E+15	3.2336E-04	0.0022	0.2507	0.0000	0.0000
Te-129	1.1600	h	0.29	4.6076E+10	2.0670E-04	0.0631	0.5420	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4539E+13	1.4617E-04	0.2710	0.0307	0.0000	0.0000
Br-82	1.4720	d	0.08	5.0385E+11	7.4216E-05	2.6600	0.1439	0.0000	0.0000
I-131	8.0230	d	0.02	2.7371E+12	7.3972E-05	0.3823	0.1920	0.0000	0.0000
Te-127	9.3500	h	0.64	9.4357E+10	5.2515E-05	0.0050	0.2245	0.0000	0.0000
I-133	20.800	h	0.48	1.5470E+11	3.8703E-05	0.6080	0.4100	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.4669E+09	2.9955E-05	0.4320	0.0984	0.0000	0.0000
N-13	9.9670	m	0.04	7.8818E+08	2.4691E-05	1.0200	0.0000	0.4909	0.0000
Te-131m	1.2500	d	0.64	1.3781E+11	2.3905E-05	1.4200	0.0523	0.0000	0.0000
Te-133m	55.400	m	0.72	3.8379E+09	2.1630E-05	1.6960	0.6000	0.0000	0.0000
Se-75	119.70	d	0.20	9.4015E+12	1.7030E-05	0.3889	0.0000	0.0000	0.0000
Te-131	25.000	m	0.40	5.5141E+08	6.8867E-06	0.4220	0.7210	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Br-84	31.800	m	0.25	6.5426E+08	6.4238E-06	1.7680	1.2360	0.0000	0.0000
Te-133	12.450	m	2.41	1.9476E+08	4.8843E-06	0.9540	0.7970	0.0000	0.0000
I-132	2.2950	h	0.57	2.0168E+09	4.5730E-06	2.2900	0.4940	0.0000	0.0000
I-124	4.1760	d	0.01	8.2751E+10	4.2966E-06	1.0900	0.0065	0.1880	0.0000
Si-31	2.6200	h	0.38	2.0196E+09	4.0113E-06	0.0018	0.5952	0.0000	0.0000
Te-129m	33.600	d	0.30	5.5351E+11	3.5718E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0351E-06	0.5990	0.0652	0.0000	0.0000
I-132m	1.3830	h	1.21	3.9382E+08	1.4818E-06	0.3190	0.1610	0.0000	0.0000
I-130	12.360	h	0.08	2.9646E+09	1.2481E-06	2.1400	0.2960	0.0000	0.0000
Br-77	2.3760	d	0.01	6.8346E+09	6.2370E-07	0.3360	0.0000	0.0011	0.0000
I-128	24.980	m	0.08	3.2614E+07	4.0764E-07	0.0915	0.7380	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 146
Total activity (Ci) = 1.41043E+06

Total number of decays = 1.92602E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.12133
Average chain length = 1.0000

Average gamma E (MeV) = 1.2834
Average beta E (MeV) = 0.46369
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9948921 R/hr per Ci/m2
Composite ECF per FGR table = 22.8232899 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0422764 Rem/hr per Ci/m2

Air Source

Point in time = 5.22441292 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	3.3343E+20	9.4970E+05	1.2840	0.4639	0.0000
Ar-37	35.030	d	0.09	5.4784E+19	339.1	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-83m	1.8300	h	1.09	4.0517E+16	115.2	0.0026	0.0382	0.0000
Kr-85m	4.4810	h	0.18	2.3684E+15	2.750	0.1570	0.2282	0.0000
Kr-79	1.4590	d	0.29	3.1910E+15	0.4742	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.2574E+15	0.3872	0.2690	0.0323	0.0013
Kr-87	1.2720	h	0.79	5.9241E+13	0.2424	0.7960	1.3380	0.0000
S-35	87.310	d	0.18	8.4035E+16	0.2087	0.0000	0.0486	0.0000
Xe-135	9.1390	h	0.22	1.7446E+14	9.9338E-02	0.2490	0.3190	0.0000
Xe-133m	2.1880	d	0.50	5.2959E+14	5.2481E-02	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	2.4498E+15	4.4525E-02	0.0200	0.1430	0.0000
Br-83	2.4000	h	0.83	1.3335E+13	2.8914E-02	0.0065	0.3249	0.0000
Xe-133	5.2440	d	0.08	5.8859E+14	2.4337E-02	0.0463	0.1360	0.0000
Cl-39	55.600	m	0.36	2.8458E+12	1.5981E-02	1.4500	0.8276	0.0000
Xe-129m	8.8800	d	0.23	5.5410E+14	1.3530E-02	0.0513	0.1830	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4100E+17	6.7883E-03	0.0000	0.0057	0.0000
Cl-38	37.200	m	0.27	4.0094E+11	3.3652E-03	1.5110	1.5200	0.0000
Se-81	18.450	m	0.65	1.2316E+11	2.0842E-03	0.0080	0.6107	0.0000
Se-81m	57.280	m	0.03	2.5923E+11	1.4131E-03	0.0182	0.0002	0.0000
I-125	59.410	d	0.02	2.9937E+14	1.0926E-03	0.0424	0.0179	0.0000
Br-80	17.600	m	0.28	3.4735E+10	6.1620E-04	0.0800	0.7182	0.0000
Br-80m	4.4110	h	0.23	4.8753E+11	5.7515E-04	0.0240	0.0000	0.0000
Kr-85	10.750	y	0.21	5.9441E+15	3.2825E-04	0.0022	0.2507	0.0000
Xe-127	36.400	d	0.27	2.4518E+13	1.4605E-04	0.2710	0.0307	0.0000
Te-129	1.1600	h	0.29	2.4965E+10	1.1199E-04	0.0631	0.5420	0.0000
I-131	8.0230	d	0.02	2.7303E+12	7.3787E-05	0.3823	0.1920	0.0000
Br-82	1.4720	d	0.08	4.9366E+11	7.2716E-05	2.6600	0.1439	0.0000
Te-127	9.3500	h	0.64	8.7381E+10	4.8632E-05	0.0050	0.2245	0.0000
I-133	20.800	h	0.48	1.5157E+11	3.7919E-05	0.6080	0.4100	0.0000
Te-131m	1.2500	d	0.64	1.3454E+11	2.3337E-05	1.4200	0.0523	0.0000
Se-75	119.70	d	0.20	9.3991E+12	1.7026E-05	0.3889	0.0000	0.0000
Te-133m	55.400	m	0.72	1.7564E+09	9.8991E-06	1.6960	0.6000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Te-131	25.000	m	0.40	4.2337E+08	5.2875E-06	0.4220	0.7210	0.0000
I-124	4.1760	d	0.01	8.2157E+10	4.2657E-06	1.0900	0.0065	0.1880
I-132	2.2950	h	0.57	1.5901E+09	3.6054E-06	2.2900	0.4940	0.0000
Te-129m	33.600	d	0.30	5.5301E+11	3.5687E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2152E-06	0.0015	0.2500	0.0000
Si-31	2.6200	h	0.38	1.5333E+09	3.0454E-06	0.0018	0.5952	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0351E-06	0.5990	0.0652	0.0000
Te-133	12.450	m	2.41	8.9102E+07	2.2346E-06	0.9540	0.7970	0.0000
Xe-135m	15.290	m	0.33	8.6560E+07	1.7676E-06	0.4320	0.0984	0.0000
Br-84	31.800	m	0.25	1.6763E+08	1.6459E-06	1.7680	1.2360	0.0000
I-130	12.360	h	0.08	2.7964E+09	1.1773E-06	2.1400	0.2960	0.0000
I-132m	1.3830	h	1.21	2.3370E+08	8.7934E-07	0.3190	0.1610	0.0000
Br-77	2.3760	d	0.01	6.7520E+09	6.1616E-07	0.3360	0.0000	0.0011
Te-125m	57.400	d	0.26	9.3863E+10	3.5456E-07	0.0360	0.1110	0.0000
N-13	9.9670	m	0.04	1.0228E+07	3.2041E-07	1.0200	0.0000	0.4909

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 144
Total activity (Ci) = 9.50321E+05

Total number of decays = 2.08763E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.13151
Average chain length = 1.0000

Average gamma E (MeV) = 1.2832
Average beta E (MeV) = 0.46361
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9907150 R/hr per Ci/m2
Composite ECF per FGR table = 22.8193188 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0394840 Rem/hr per Ci/m2

Air Source

Point in time = 6.52478266 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270 h 0.36	2.0358E+20	5.7986E+05	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030 d 0.09	5.4725E+19	338.7	0.0002	0.0019	0.0000	0.0000
C-14	5701.1 y 0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-83m	1.8300 h 1.09	2.4762E+16	70.41	0.0026	0.0382	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.9368E+15	2.249	0.1570	0.2282	0.0000	0.0000
Kr-79	1.4590 d 0.29	3.1099E+15	0.4622	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900 h 1.18	1.1921E+15	0.3671	0.2690	0.0323	0.0013	0.0000
S-35	87.310 d 0.18	8.3999E+16	0.2086	0.0000	0.0486	0.0000	0.0000
Kr-87	1.2720 h 0.79	2.9166E+13	0.1193	0.7960	1.3380	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.5807E+14	9.0008E-02	0.2490	0.3190	0.0000	0.0000
Xe-133m	2.1880 d 0.50	5.2058E+14	5.1588E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930 d 0.13	2.4421E+15	4.4385E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440 d 0.08	5.9338E+14	2.4535E-02	0.0463	0.1360	0.0000	0.0000
Br-83	2.4000 h 0.83	9.1599E+12	1.9861E-02	0.0065	0.3249	0.0000	0.0000
Xe-129m	8.8800 d 0.23	5.5177E+14	1.3473E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01 y 3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330 y 0.16	1.4099E+17	6.7882E-03	0.0000	0.0057	0.0000	0.0000
Cl-39	55.600 m 0.36	1.0759E+12	6.0419E-03	1.4500	0.8276	0.0000	0.0000
I-125	59.410 d 0.02	3.6447E+14	1.3302E-03	0.0424	0.0179	0.0000	0.0000
Se-81	18.450 m 0.65	4.7893E+10	8.1050E-04	0.0080	0.6107	0.0000	0.0000
Cl-38	37.200 m 0.27	9.3692E+10	7.8638E-04	1.5110	1.5200	0.0000	0.0000
Se-81m	57.280 m 0.03	1.0084E+11	5.4969E-04	0.0182	0.0002	0.0000	0.0000
Br-80	17.600 m 0.28	2.8312E+10	5.0226E-04	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110 h 0.23	3.9742E+11	4.6885E-04	0.0240	0.0000	0.0000	0.0000
Kr-85	10.750 y 0.21	6.0364E+15	3.3334E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400 d 0.27	2.4493E+13	1.4590E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230 d 0.02	2.7215E+12	7.3551E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720 d 0.08	4.8122E+11	7.0884E-05	2.6600	0.1439	0.0000	0.0000
Te-129	1.1600 h 0.29	1.1749E+10	5.2705E-05	0.0631	0.5420	0.0000	0.0000
Te-127	9.3500 h 0.64	7.9391E+10	4.4186E-05	0.0050	0.2245	0.0000	0.0000
I-133	20.800 h 0.48	1.4626E+11	3.6592E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500 d 0.64	1.3056E+11	2.2646E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70 d 0.20	9.3962E+12	1.7020E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06 y 1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-131	25.000 m 0.40	3.8908E+08	4.8593E-06	0.4220	0.7210	0.0000	0.0000
I-124	4.1760 d 0.01	8.1422E+10	4.2276E-06	1.0900	0.0065	0.1880	0.0000
Te-133m	55.400 m 0.72	6.6173E+08	3.7294E-06	1.6960	0.6000	0.0000	0.0000
Te-129m	33.600 d 0.30	5.5239E+11	3.5647E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041 y 0.10	1.6270E+14	3.2151E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.4807E+07	3.0351E-06	0.5990	0.0652	0.0000	0.0000
I-132	2.2950 h 0.57	1.1526E+09	2.6134E-06	2.2900	0.4940	0.0000	0.0000
Si-31	2.6200 h 0.38	1.0870E+09	2.1589E-06	0.0018	0.5952	0.0000	0.0000
I-130	12.360 h 0.08	2.5997E+09	1.0945E-06	2.1400	0.2960	0.0000	0.0000
Te-133	12.450 m 2.41	3.3568E+07	8.4184E-07	0.9540	0.7970	0.0000	0.0000
Br-77	2.3760 d 0.01	6.6483E+09	6.0670E-07	0.3360	0.0000	0.0011	0.0000
I-132m	1.3830 h 1.21	1.2179E+08	4.5826E-07	0.3190	0.1610	0.0000	0.0000
Te-125m	57.400 d 0.26	9.3802E+10	3.5433E-07	0.0360	0.1110	0.0000	0.0000
Br-84	31.800 m 0.25	3.0604E+07	3.0048E-07	1.7680	1.2360	0.0000	0.0000
Te-127m	109.00 d 1.84	1.2828E+11	2.5517E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160 d 0.26	1.7120E+10	1.9374E-07	0.5770	0.0091	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 141
Total activity (Ci) = 5.80443E+05

Total number of decays = 2.21758E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.13969
Average chain length = 1.0000

Average gamma E (MeV) = 1.2827
Average beta E (MeV) = 0.46346
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9825745 R/hr per Ci/m2
Composite ECF per FGR table = 22.8115788 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0340424 Rem/hr per Ci/m2

Air Source

Point in time = 8.14881039 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.0994E+20	3.1314E+05	1.2840	0.4639	0.0000
Ar-37	35.030	d	0.09	5.4652E+19	338.3	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Kr-83m	1.8300	h	1.09	1.3388E+16	38.07	0.0026	0.0382	0.0000
Kr-85m	4.4810	h	0.18	1.5066E+15	1.750	0.1570	0.2282	0.0000
Kr-79	1.4590	d	0.29	3.0115E+15	0.4476	0.2570	0.0053	0.0183
Xe-125	16.900	h	1.18	1.1153E+15	0.3434	0.2690	0.0323	0.0013
S-35	87.310	d	0.18	8.3953E+16	0.2085	0.0000	0.0486	0.0000
Xe-135	9.1390	h	0.22	1.3975E+14	7.9577E-02	0.2490	0.3190	0.0000
Xe-133m	2.1880	d	0.50	5.0954E+14	5.0494E-02	0.0414	0.1920	0.0000
Kr-87	1.2720	h	0.79	1.2038E+13	4.9246E-02	0.7960	1.3380	0.0000
Xe-131m	11.930	d	0.13	2.4325E+15	4.4211E-02	0.0200	0.1430	0.0000
Xe-133	5.2440	d	0.08	5.9910E+14	2.4771E-02	0.0463	0.1360	0.0000
Xe-129m	8.8800	d	0.23	5.4886E+14	1.3402E-02	0.0513	0.1830	0.0000
Br-83	2.4000	h	0.83	5.7305E+12	1.2425E-02	0.0065	0.3249	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4099E+17	6.7882E-03	0.0000	0.0057	0.0000
Cl-39	55.600	m	0.36	3.1931E+11	1.7931E-03	1.4500	0.8276	0.0000
I-125	59.410	d	0.02	4.4097E+14	1.6094E-03	0.0424	0.0179	0.0000
Br-80	17.600	m	0.28	2.1935E+10	3.8913E-04	0.0800	0.7182	0.0081
Br-80m	4.4110	h	0.23	3.0791E+11	3.6325E-04	0.0240	0.0000	0.0000
Kr-85	10.750	y	0.21	6.1284E+15	3.3842E-04	0.0022	0.2507	0.0000
Se-81	18.450	m	0.65	1.4729E+10	2.4925E-04	0.0080	0.6107	0.0000
Se-81m	57.280	m	0.03	3.1014E+10	1.6905E-04	0.0182	0.0002	0.0000
Xe-127	36.400	d	0.27	2.4462E+13	1.4571E-04	0.2710	0.0307	0.0000
Cl-38	37.200	m	0.27	1.5247E+10	1.2797E-04	1.5110	1.5200	0.0000
I-131	8.0230	d	0.02	2.7105E+12	7.3252E-05	0.3823	0.1920	0.0000
Br-82	1.4720	d	0.08	4.6613E+11	6.8661E-05	2.6600	0.1439	0.0000
Te-127	9.3500	h	0.64	7.0437E+10	3.9202E-05	0.0050	0.2245	0.0000
I-133	20.800	h	0.48	1.3903E+11	3.4783E-05	0.6080	0.4100	0.0000
Te-131m	1.2500	d	0.64	1.2575E+11	2.1812E-05	1.4200	0.0523	0.0000
Te-129	1.1600	h	0.29	4.7625E+09	2.1365E-05	0.0631	0.5420	0.0000
Se-75	119.70	d	0.20	9.3925E+12	1.7014E-05	0.3889	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Te-131	25.000	m	0.40	3.7213E+08	4.6476E-06	0.4220	0.7210	0.0000
I-124	4.1760	d	0.01	8.0512E+10	4.1803E-06	1.0900	0.0065	0.1880
Te-129m	33.600	d	0.30	5.5162E+11	3.5597E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2151E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0350E-06	0.5990	0.0652	0.0000
I-132	2.2950	h	0.57	7.5159E+08	1.7042E-06	2.2900	0.4940	0.0000
Si-31	2.6200	h	0.38	7.0734E+08	1.4049E-06	0.0018	0.5952	0.0000
Te-133m	55.400	m	0.72	1.9553E+08	1.1020E-06	1.6960	0.6000	0.0000
I-130	12.360	h	0.08	2.3734E+09	9.9926E-07	2.1400	0.2960	0.0000
Br-77	2.3760	d	0.01	6.5196E+09	5.9495E-07	0.3360	0.0000	0.0011
Te-125m	57.400	d	0.26	9.3725E+10	3.5404E-07	0.0360	0.1110	0.0000
Te-127m	109.00	d	1.84	1.2822E+11	2.5506E-07	0.0111	0.0821	0.0000
Te-133	12.450	m	2.41	9.9186E+06	2.4874E-07	0.9540	0.7970	0.0000
I-132m	1.3830	h	1.21	5.3966E+07	2.0306E-07	0.3190	0.1610	0.0000
Te-121	19.160	d	0.26	1.7082E+10	1.9331E-07	0.5770	0.0091	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 140
Total activity (Ci) = 3.13685E+05

Total number of decays = 2.31134E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.14560
Average chain length = 1.0000

Average gamma E (MeV) = 1.2818
Average beta E (MeV) = 0.46313
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9648151 R/hr per Ci/m2
Composite ECF per FGR table = 22.7946892 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0221729 Rem/hr per Ci/m2

Air Source

Point in time = 10.1770706 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	5.0929E+19	1.4506E+05	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4560E+19	337.7	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-83m	1.8300	h	1.09	6.2115E+15	17.66	0.0026	0.0382	0.0000	0.0000
Kr-85m	4.4810	h	0.18	1.1009E+15	1.278	0.1570	0.2282	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.8930E+15	0.4299	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.0263E+15	0.3160	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.3897E+16	0.2083	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.1983E+14	6.8231E-02	0.2490	0.3190	0.0000	0.0000
Xe-133m	2.1880	d	0.50	4.9608E+14	4.9160E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.4206E+15	4.3994E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.0584E+14	2.5050E-02	0.0463	0.1360	0.0000	0.0000
Kr-87	1.2720	h	0.79	3.9860E+12	1.6307E-02	0.7960	1.3380	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.4525E+14	1.3314E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
Br-83	2.4000	h	0.83	3.1900E+12	6.9167E-03	0.0065	0.3249	0.0000	0.0000
H-3	12.330	y	0.16	1.4099E+17	6.7881E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	5.2952E+14	1.9326E-03	0.0424	0.0179	0.0000	0.0000
Cl-39	55.600	m	0.36	7.0036E+10	3.9330E-04	1.4500	0.8276	0.0000	0.0000
Kr-85	10.750	y	0.21	6.2152E+15	3.4321E-04	0.0022	0.2507	0.0000	0.0000
Br-80	17.600	m	0.28	1.5948E+10	2.8293E-04	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	2.2387E+11	2.6411E-04	0.0240	0.0000	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4422E+13	1.4548E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.6965E+12	7.2875E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	4.4794E+11	6.5982E-05	2.6600	0.1439	0.0000	0.0000
Se-81	18.450	m	0.65	3.3775E+09	5.7157E-05	0.0080	0.6107	0.0000	0.0000
Se-81m	57.280	m	0.03	7.1120E+09	3.8767E-05	0.0182	0.0002	0.0000	0.0000
Te-127	9.3500	h	0.64	6.0666E+10	3.3764E-05	0.0050	0.2245	0.0000	0.0000
I-133	20.800	h	0.48	1.3010E+11	3.2548E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.1999E+11	2.0814E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70	d	0.20	9.3879E+12	1.7005E-05	0.3889	0.0000	0.0000	0.0000
Cl-38	37.200	m	0.27	1.5791E+09	1.3253E-05	1.5110	1.5200	0.0000	0.0000
Te-129	1.1600	h	0.29	1.7681E+09	7.9320E-06	0.0631	0.5420	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-131	25.000	m	0.40	3.5491E+08	4.4325E-06	0.4220	0.7210	0.0000	0.0000
I-124	4.1760	d	0.01	7.9391E+10	4.1221E-06	1.0900	0.0065	0.1880	0.0000
Te-129m	33.600	d	0.30	5.5066E+11	3.5535E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6270E+14	3.2151E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4807E+07	3.0350E-06	0.5990	0.0652	0.0000	0.0000
I-132	2.2950	h	0.57	4.2979E+08	9.7453E-07	2.2900	0.4940	0.0000	0.0000
I-130	12.360	h	0.08	2.1183E+09	8.9183E-07	2.1400	0.2960	0.0000	0.0000
Si-31	2.6200	h	0.38	4.1360E+08	8.2149E-07	0.0018	0.5952	0.0000	0.0000
Br-77	2.3760	d	0.01	6.3614E+09	5.8051E-07	0.3360	0.0000	0.0011	0.0000
Te-125m	57.400	d	0.26	9.3629E+10	3.5368E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2815E+11	2.5493E-07	0.0111	0.0821	0.0000	0.0000
Te-133m	55.400	m	0.72	4.2652E+07	2.4038E-07	1.6960	0.6000	0.0000	0.0000
Te-121	19.160	d	0.26	1.7036E+10	1.9279E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.9175E+09	1.3236E-07	0.4330	0.1400	0.0055	0.0000
I-132m	1.3830	h	1.21	1.9527E+07	7.3475E-08	0.3190	0.1610	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 140
Total activity (Ci) = 1.45583E+05

Total number of decays = 2.37050E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.14932
Average chain length = 1.0000

Average gamma E (MeV) = 1.2794
Average beta E (MeV) = 0.46230
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.9202766 R/hr per Ci/m2
Composite ECF per FGR table = 22.7523270 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.9924021 Rem/hr per Ci/m2

Air Source

Point in time = 12.7101564 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)				
						gamma	beta(-)	beta(+)	alpha	
Ar-41	1.8270		h	0.36	1.9480E+19	5.5485E+04	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030		d	0.09	5.4446E+19	337.0	0.0002	0.0019	0.0000	0.0000
C-14	5701.1		y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-83m	1.8300		h	1.09	2.3806E+15	6.770	0.0026	0.0382	0.0000	0.0000
Kr-85m	4.4810		h	0.18	7.4398E+14	0.8640	0.1570	0.2282	0.0000	0.0000
Kr-79	1.4590		d	0.29	2.7515E+15	0.4089	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900		h	1.18	9.2501E+14	0.2848	0.2690	0.0323	0.0013	0.0000
S-35	87.310		d	0.18	8.3827E+16	0.2082	0.0000	0.0486	0.0000	0.0000
Xe-135	9.1390		h	0.22	9.8882E+13	5.6304E-02	0.2490	0.3190	0.0000	0.0000
Xe-133m	2.1880		d	0.50	4.7976E+14	4.7544E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930		d	0.13	2.4058E+15	4.3725E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440		d	0.08	6.1365E+14	2.5373E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800		d	0.23	5.4078E+14	1.3204E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01		y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330		y	0.16	1.4099E+17	6.7880E-03	0.0000	0.0057	0.0000	0.0000
Kr-87	1.2720		h	0.79	1.0024E+12	4.1010E-03	0.7960	1.3380	0.0000	0.0000
Br-83	2.4000		h	0.83	1.5348E+12	3.3279E-03	0.0065	0.3249	0.0000	0.0000
I-125	59.410		d	0.02	6.3008E+14	2.2996E-03	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750		y	0.21	6.2914E+15	3.4742E-04	0.0022	0.2507	0.0000	0.0000
Br-80	17.600		m	0.28	1.0711E+10	1.9002E-04	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110		h	0.23	1.5036E+11	1.7738E-04	0.0240	0.0000	0.0000	0.0000
Xe-127	36.400		d	0.27	2.4373E+13	1.4518E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230		d	0.02	2.6789E+12	7.2398E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720		d	0.08	4.2623E+11	6.2783E-05	2.6600	0.1439	0.0000	0.0000
Cl-39	55.600		m	0.36	1.0530E+10	5.9135E-05	1.4500	0.8276	0.0000	0.0000
I-133	20.800		h	0.48	1.1960E+11	2.9922E-05	0.6080	0.4100	0.0000	0.0000
Te-127	9.3500		h	0.64	5.0356E+10	2.8026E-05	0.0050	0.2245	0.0000	0.0000
Te-131m	1.2500		d	0.64	1.1317E+11	1.9631E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70		d	0.20	9.3822E+12	1.6995E-05	0.3889	0.0000	0.0000	0.0000
Se-81	18.450		m	0.65	5.3685E+08	9.0851E-06	0.0080	0.6107	0.0000	0.0000
Cl-36	0.30101E+06		y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Se-81m	57.280		m	0.03	1.1304E+09	6.1620E-06	0.0182	0.0002	0.0000	0.0000
Te-131	25.000		m	0.40	3.3473E+08	4.1805E-06	0.4220	0.7210	0.0000	0.0000
I-124	4.1760		d	0.01	7.8012E+10	4.0505E-06	1.0900	0.0065	0.1880	0.0000
Te-129m	33.600		d	0.30	5.4946E+11	3.5458E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600		h	0.29	7.7786E+08	3.4895E-06	0.0631	0.5420	0.0000	0.0000
Cs-137	30.041		y	0.10	1.6269E+14	3.2151E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520		m	0.04	2.4807E+07	3.0350E-06	0.5990	0.0652	0.0000	0.0000
Cl-38	37.200		m	0.27	9.3005E+07	7.8061E-07	1.5110	1.5200	0.0000	0.0000
I-130	12.360		h	0.08	1.8377E+09	7.7373E-07	2.1400	0.2960	0.0000	0.0000
Br-77	2.3760		d	0.01	6.1687E+09	5.6293E-07	0.3360	0.0000	0.0011	0.0000
I-132	2.2950		h	0.57	2.0942E+08	4.7485E-07	2.2900	0.4940	0.0000	0.0000
Si-31	2.6200		h	0.38	2.1161E+08	4.2030E-07	0.0018	0.5952	0.0000	0.0000
Te-125m	57.400		d	0.26	9.3510E+10	3.5323E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00		d	1.84	1.2807E+11	2.5476E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160		d	0.26	1.6978E+10	1.9214E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06		y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970		d	0.39	7.8730E+09	1.3162E-07	0.4330	0.1400	0.0055	0.0000
Te-133m	55.400		m	0.72	6.3693E+06	3.5897E-08	1.6960	0.6000	0.0000	0.0000
I-123	13.220		h	0.03	6.9433E+07	2.7331E-08	0.1723	0.0276	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 140
Total activity (Ci) = 55996.

Total number of decays = 2.40212E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15132
Average chain length = 1.0000

Average gamma E (MeV) = 1.2723
Average beta E (MeV) = 0.45984
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.7875652 R/hr per Ci/m2
Composite ECF per FGR table = 22.6261063 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.9036913 Rem/hr per Ci/m2

Air Source

Point in time = 15.8737326 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	5.8660E+18	1.6708E+04	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4305E+19	336.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-83m	1.8300	h	1.09	7.1877E+14	2.044	0.0026	0.0382	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.5608E+14	0.5296	0.1570	0.2282	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.5845E+15	0.3841	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	8.1245E+14	0.2502	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.3739E+16	0.2080	0.0000	0.0486	0.0000	0.0000
Xe-133m	2.1880	d	0.50	4.6014E+14	4.5599E-02	0.0414	0.1920	0.0000	0.0000
Xe-135	9.1390	h	0.22	7.7788E+13	4.4293E-02	0.2490	0.3190	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.3875E+15	4.3392E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.2251E+14	2.5739E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.3524E+14	1.3069E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4099E+17	6.7878E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	7.4158E+14	2.7065E-03	0.0424	0.0179	0.0000	0.0000
Br-83	2.4000	h	0.83	6.1554E+11	1.3347E-03	0.0065	0.3249	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.7880E+11	7.3148E-04	0.7960	1.3380	0.0000	0.0000
Kr-85	10.750	y	0.21	6.3529E+15	3.5082E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4312E+13	1.4482E-04	0.2710	0.0307	0.0000	0.0000
Br-80	17.600	m	0.28	6.5154E+09	1.1559E-04	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	9.1460E+10	1.0790E-04	0.0240	0.0000	0.0000	0.0000
I-131	8.0230	d	0.02	2.6565E+12	7.1793E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	4.0057E+11	5.9004E-05	2.6600	0.1439	0.0000	0.0000
I-133	20.800	h	0.48	1.0764E+11	2.6930E-05	0.6080	0.4100	0.0000	0.0000
Te-127	9.3500	h	0.64	3.9922E+10	2.2219E-05	0.0050	0.2245	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.0519E+11	1.8247E-05	1.4200	0.0523	0.0000	0.0000
Se-75	119.70	d	0.20	9.3750E+12	1.6982E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cl-39	55.600	m	0.36	9.8798E+08	5.5481E-06	1.4500	0.8276	0.0000	0.0000
I-124	4.1760	d	0.01	7.6324E+10	3.9629E-06	1.0900	0.0065	0.1880	0.0000
Te-131	25.000	m	0.40	3.1114E+08	3.8858E-06	0.4220	0.7210	0.0000	0.0000
Te-129m	33.600	d	0.30	5.4797E+11	3.5361E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6269E+14	3.2151E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4806E+07	3.0350E-06	0.5990	0.0652	0.0000	0.0000
Te-129	1.1600	h	0.29	5.3948E+08	2.4201E-06	0.0631	0.5420	0.0000	0.0000
Se-81	18.450	m	0.65	5.3988E+07	9.1364E-07	0.0080	0.6107	0.0000	0.0000
I-130	12.360	h	0.08	1.5390E+09	6.4794E-07	2.1400	0.2960	0.0000	0.0000
Se-81m	57.280	m	0.03	1.1368E+08	6.1968E-07	0.0182	0.0002	0.0000	0.0000
Br-77	2.3760	d	0.01	5.9360E+09	5.4170E-07	0.3360	0.0000	0.0011	0.0000
Te-125m	57.400	d	0.26	9.3361E+10	3.5267E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2796E+11	2.5454E-07	0.0111	0.0821	0.0000	0.0000
I-132	2.2950	h	0.57	8.4522E+07	1.9165E-07	2.2900	0.4940	0.0000	0.0000
Te-121	19.160	d	0.26	1.6907E+10	1.9133E-07	0.5770	0.0091	0.0000	0.0000
Si-31	2.6200	h	0.38	9.1634E+07	1.8200E-07	0.0018	0.5952	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.8177E+09	1.3069E-07	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.7219E+10	2.4227E-08	0.2171	0.0769	0.0000	0.0000
I-123	13.220	h	0.03	5.9559E+07	2.3444E-08	0.1723	0.0276	0.0000	0.0000
Cl-38	37.200	m	0.27	2.7070E+06	2.2720E-08	1.5110	1.5200	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 138
Total activity (Ci) = 17213.

Total number of decays = 2.41595E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15219
Average chain length = 1.0000

Average gamma E (MeV) = 1.2464
Average beta E (MeV) = 0.45082
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.3026924 R/hr per Ci/m2
Composite ECF per FGR table = 22.1649437 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.5795765 Rem/hr per Ci/m2

Air Source

Point in time = 19.8247452 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	1.3102E+18	3732.	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030	d	0.09	5.4128E+19	335.0	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-83m	1.8300	h	1.09	1.6113E+14	0.4582	0.0026	0.0382	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.3901E+15	0.3552	0.2570	0.0053	0.0183	0.0000
Kr-85m	4.4810	h	0.18	2.4752E+14	0.2874	0.1570	0.2282	0.0000	0.0000
Xe-125	16.900	h	1.18	6.9090E+14	0.2127	0.2690	0.0323	0.0013	0.0000
S-35	87.310	d	0.18	8.3630E+16	0.2077	0.0000	0.0486	0.0000	0.0000
Xe-133m	2.1880	d	0.50	4.3676E+14	4.3282E-02	0.0414	0.1920	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.3647E+15	4.2979E-02	0.0200	0.1430	0.0000	0.0000
Xe-135	9.1390	h	0.22	5.7646E+13	3.2824E-02	0.2490	0.3190	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.3226E+14	2.6142E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.2841E+14	1.2902E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4098E+17	6.7877E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	8.6158E+14	3.1445E-03	0.0424	0.0179	0.0000	0.0000
Br-83	2.4000	h	0.83	1.9665E+11	4.2638E-04	0.0065	0.3249	0.0000	0.0000
Kr-85	10.750	y	0.21	6.3973E+15	3.5327E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4236E+13	1.4437E-04	0.2710	0.0307	0.0000	0.0000
Kr-87	1.2720	h	0.79	2.0765E+10	8.4949E-05	0.7960	1.3380	0.0000	0.0000
I-131	8.0230	d	0.02	2.6281E+12	7.1026E-05	0.3823	0.1920	0.0000	0.0000
Br-80	17.600	m	0.28	3.5019E+09	6.2125E-05	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	4.9158E+10	5.7993E-05	0.0240	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	3.7069E+11	5.4603E-05	2.6600	0.1439	0.0000	0.0000
I-133	20.800	h	0.48	9.4362E+10	2.3608E-05	0.6080	0.4100	0.0000	0.0000
Se-75	119.70	d	0.20	9.3661E+12	1.6966E-05	0.3889	0.0000	0.0000	0.0000
Te-131m	1.2500	d	0.64	9.6016E+10	1.6655E-05	1.4200	0.0523	0.0000	0.0000
Te-127	9.3500	h	0.64	2.9899E+10	1.6641E-05	0.0050	0.2245	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
I-124	4.1760	d	0.01	7.4266E+10	3.8560E-06	1.0900	0.0065	0.1880	0.0000
Te-131	25.000	m	0.40	2.8399E+08	3.5468E-06	0.4220	0.7210	0.0000	0.0000
Te-129m	33.600	d	0.30	5.4611E+11	3.5241E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6269E+14	3.2150E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4806E+07	3.0350E-06	0.5990	0.0652	0.0000	0.0000
Te-129	1.1600	h	0.29	4.9961E+08	2.2413E-06	0.0631	0.5420	0.0000	0.0000
I-130	12.360	h	0.08	1.2331E+09	5.1917E-07	2.1400	0.2960	0.0000	0.0000
Br-77	2.3760	d	0.01	5.6577E+09	5.1630E-07	0.3360	0.0000	0.0011	0.0000
Te-125m	57.400	d	0.26	9.3176E+10	3.5197E-07	0.0360	0.1110	0.0000	0.0000
Cl-39	55.600	m	0.36	5.1434E+07	2.8883E-07	1.4500	0.8276	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2783E+11	2.5428E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.6818E+10	1.9032E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.7492E+09	1.2955E-07	0.4330	0.1400	0.0055	0.0000
Si-31	2.6200	h	0.38	3.2218E+07	6.3991E-08	0.0018	0.5952	0.0000	0.0000
I-132	2.2950	h	0.57	2.8045E+07	6.3592E-08	2.2900	0.4940	0.0000	0.0000
Se-81	18.450	m	0.65	3.0651E+06	5.1871E-08	0.0080	0.6107	0.0000	0.0000
Se-81m	57.280	m	0.03	6.4542E+06	3.5181E-08	0.0182	0.0002	0.0000	0.0000
Te-121m	154.10	d	4.54	1.7206E+10	2.4210E-08	0.2171	0.0769	0.0000	0.0000
I-123	13.220	h	0.03	4.8696E+07	1.9168E-08	0.1723	0.0276	0.0000	0.0000
Te-123m	119.40	d	0.08	7.9607E+09	1.4456E-08	0.1480	0.1020	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 133
Total activity (Ci) = 4233.6

Total number of decays = 2.42077E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15249
Average chain length = 1.0000

Average gamma E (MeV) = 1.1319
Average beta E (MeV) = 0.41103
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 21.1619682 R/hr per Ci/m2
Composite ECF per FGR table = 20.1288567 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.1485844 Rem/hr per Ci/m2

Air Source

Point in time = 1.03163242 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-41	1.8270	h	0.36	2.0152E+17	574.0	1.2840	0.4639	0.0000	0.0000
Ar-37	35.030	d	0.09	5.3908E+19	333.7	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Kr-79	1.4590	d	0.29	2.1677E+15	0.3221	0.2570	0.0053	0.0183	0.0000
S-35	87.310	d	0.18	8.3493E+16	0.2073	0.0000	0.0486	0.0000	0.0000
Xe-125	16.900	h	1.18	5.6432E+14	0.1738	0.2690	0.0323	0.0013	0.0000
Kr-85m	4.4810	h	0.18	1.1538E+14	0.1340	0.1570	0.2282	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.4912E+13	7.0841E-02	0.0026	0.0382	0.0000	0.0000
Xe-131m	11.930	d	0.13	2.3367E+15	4.2468E-02	0.0200	0.1430	0.0000	0.0000
Xe-133m	2.1880	d	0.50	4.0922E+14	4.0553E-02	0.0414	0.1920	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.4248E+14	2.6565E-02	0.0463	0.1360	0.0000	0.0000
Xe-135	9.1390	h	0.22	3.9649E+13	2.2577E-02	0.2490	0.3190	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.1999E+14	1.2697E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4098E+17	6.7875E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	9.8595E+14	3.5984E-03	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4254E+15	3.5482E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.4141E+13	1.4380E-04	0.2710	0.0307	0.0000	0.0000
Br-83	2.4000	h	0.83	4.7290E+10	1.0254E-04	0.0065	0.3249	0.0000	0.0000
I-131	8.0230	d	0.02	2.5921E+12	7.0053E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	3.3649E+11	4.9565E-05	2.6600	0.1439	0.0000	0.0000
Br-80	17.600	m	0.28	1.6127E+09	2.8610E-05	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	2.2638E+10	2.6707E-05	0.0240	0.0000	0.0000	0.0000
I-133	20.800	h	0.48	8.0054E+10	2.0028E-05	0.6080	0.4100	0.0000	0.0000
Se-75	119.70	d	0.20	9.3549E+12	1.6946E-05	0.3889	0.0000	0.0000	0.0000
Te-131m	1.2500	d	0.64	8.5670E+10	1.4860E-05	1.4200	0.0523	0.0000	0.0000
Te-127	9.3500	h	0.64	2.0876E+10	1.1618E-05	0.0050	0.2245	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Kr-87	1.2720	h	0.79	1.4111E+09	5.7727E-06	0.7960	1.3380	0.0000	0.0000
I-124	4.1760	d	0.01	7.1775E+10	3.7267E-06	1.0900	0.0065	0.1880	0.0000
Te-129m	33.600	d	0.30	5.4380E+11	3.5092E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6269E+14	3.2150E-06	0.0015	0.2500	0.0000	0.0000
Te-131	25.000	m	0.40	2.5339E+08	3.1646E-06	0.4220	0.7210	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4806E+07	3.0349E-06	0.5990	0.0652	0.0000	0.0000
Te-129	1.1600	h	0.29	4.9374E+08	2.2149E-06	0.0631	0.5420	0.0000	0.0000
Br-77	2.3760	d	0.01	5.3283E+09	4.8624E-07	0.3360	0.0000	0.0011	0.0000
I-130	12.360	h	0.08	9.3504E+08	3.9367E-07	2.1400	0.2960	0.0000	0.0000
Te-125m	57.400	d	0.26	9.2945E+10	3.5109E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2766E+11	2.5394E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.6707E+10	1.8907E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.6646E+09	1.2813E-07	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.7190E+10	2.4187E-08	0.2171	0.0769	0.0000	0.0000
I-132	2.2950	h	0.57	8.5144E+06	1.9306E-08	2.2900	0.4940	0.0000	0.0000
Si-31	2.6200	h	0.38	8.7326E+06	1.7345E-08	0.0018	0.5952	0.0000	0.0000
I-123	13.220	h	0.03	3.7675E+07	1.4830E-08	0.1723	0.0276	0.0000	0.0000
Te-123m	119.40	d	0.08	7.9512E+09	1.4439E-08	0.1480	0.1020	0.0000	0.0000
Cl-39	55.600	m	0.36	1.2832E+06	7.2059E-09	1.4500	0.8276	0.0000	0.0000
Te-132	3.2040	d	0.41	9.1357E+07	6.1824E-09	0.2340	0.1020	0.0000	0.0000
I-135	6.5690	h	0.30	3.5420E+06	2.8059E-09	1.6500	0.3770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 131
Total activity (Ci) = 1073.8

Total number of decays = 2.42221E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15258
Average chain length = 1.0000

Average gamma E (MeV) = 0.68658
Average beta E (MeV) = 0.25626
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 12.8349819 R/hr per Ci/m2
Composite ECF per FGR table = 12.2087545 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 8.58222485 Rem/hr per Ci/m2

Air Source

Point in time = 1.28840601 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.3635E+19	332.0	0.0002	0.0019	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Ar-41	1.8270	h	0.36	1.9450E+16	55.40	1.2840	0.4639	0.0000
Kr-79	1.4590	d	0.29	1.9187E+15	0.2851	0.2570	0.0053	0.0183
S-35	87.310	d	0.18	8.3323E+16	0.2069	0.0000	0.0486	0.0000
Xe-125	16.900	h	1.18	4.3828E+14	0.1350	0.2690	0.0323	0.0013
Kr-85m	4.4810	h	0.18	4.4476E+13	5.1650E-02	0.1570	0.2282	0.0000
Xe-131m	11.930	d	0.13	2.3021E+15	4.1840E-02	0.0200	0.1430	0.0000
Xe-133m	2.1880	d	0.50	3.7725E+14	3.7385E-02	0.0414	0.1920	0.0000
Xe-133	5.2440	d	0.08	6.5248E+14	2.6978E-02	0.0463	0.1360	0.0000
Xe-135	9.1390	h	0.22	2.4845E+13	1.4147E-02	0.2490	0.3190	0.0000
Xe-129m	8.8800	d	0.23	5.0968E+14	1.2445E-02	0.0513	0.1830	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0864E-03	0.0002	0.2188	0.0000
Kr-83m	1.8300	h	1.09	2.4246E+12	6.8947E-03	0.0026	0.0382	0.0000
H-3	12.330	y	0.16	1.4097E+17	6.7872E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	1.1088E+15	4.0469E-03	0.0424	0.0179	0.0000
Kr-85	10.750	y	0.21	6.4403E+15	3.5564E-04	0.0022	0.2507	0.0000
Xe-127	36.400	d	0.27	2.4024E+13	1.4310E-04	0.2710	0.0307	0.0000
I-131	8.0230	d	0.02	2.5465E+12	6.8821E-05	0.3823	0.1920	0.0000
Br-82	1.4720	d	0.08	2.9817E+11	4.3920E-05	2.6600	0.1439	0.0000
Br-83	2.4000	h	0.83	7.9763E+09	1.7295E-05	0.0065	0.3249	0.0000
Se-75	119.70	d	0.20	9.3410E+12	1.6920E-05	0.3889	0.0000	0.0000
I-133	20.800	h	0.48	6.5192E+10	1.6310E-05	0.6080	0.4100	0.0000
Te-131m	1.2500	d	0.64	7.4301E+10	1.2888E-05	1.4200	0.0523	0.0000
Br-80	17.600	m	0.28	6.1233E+08	1.0863E-05	0.0800	0.7182	0.0000
Br-80m	4.4110	h	0.23	8.5956E+09	1.0141E-05	0.0240	0.0000	0.0000
Te-127	9.3500	h	0.64	1.3383E+10	7.4485E-06	0.0050	0.2245	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
I-124	4.1760	d	0.01	6.8780E+10	3.5712E-06	1.0900	0.0065	0.1880
Te-129m	33.600	d	0.30	5.4093E+11	3.4907E-06	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.6269E+14	3.2149E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4805E+07	3.0349E-06	0.5990	0.0652	0.0000
Te-131	25.000	m	0.40	2.1976E+08	2.7446E-06	0.4220	0.7210	0.0000
Te-129	1.1600	h	0.29	4.9093E+08	2.2023E-06	0.0631	0.5420	0.0000
Br-77	2.3760	d	0.01	4.9438E+09	4.5115E-07	0.3360	0.0000	0.0011
Te-125m	57.400	d	0.26	9.2657E+10	3.5001E-07	0.0360	0.1110	0.0000
I-130	12.360	h	0.08	6.6182E+08	2.7864E-07	2.1400	0.2960	0.0000
Te-127m	109.00	d	1.84	1.2745E+11	2.5353E-07	0.0111	0.0821	0.0000
Kr-87	1.2720	h	0.79	4.9105E+07	2.0089E-07	0.7960	1.3380	0.0000
Te-121	19.160	d	0.26	1.6570E+10	1.8752E-07	0.5770	0.0091	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
I-126	12.970	d	0.39	7.5601E+09	1.2639E-07	0.4330	0.1400	0.0055
Te-121m	154.10	d	4.54	1.7170E+10	2.4159E-08	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	7.9394E+09	1.4418E-08	0.1480	0.1020	0.0000
I-123	13.220	h	0.03	2.7289E+07	1.0742E-08	0.1723	0.0276	0.0000
I-132	2.2950	h	0.57	3.5486E+06	8.0462E-09	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	8.6420E+07	5.8483E-09	0.2340	0.1020	0.0000
Si-31	2.6200	h	0.38	1.7104E+06	3.3971E-09	0.0018	0.5952	0.0000
Br-76	16.200	h	1.24	6.0646E+06	1.9481E-09	2.7800	0.0000	0.6515
I-135	6.5690	h	0.30	1.8486E+06	1.4644E-09	1.6500	0.3770	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 129
Total activity (Ci) = 553.26

Total number of decays = 2.42280E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15262
Average chain length = 1.0000

Average gamma E (MeV) = 0.12894
Average beta E (MeV) = 6.24816E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.40762115 R/hr per Ci/m2
Composite ECF per FGR table = 2.29072332 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.61171710 Rem/hr per Ci/m2

Air Source

Point in time = 1.60909343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.3296E+19	329.9	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-41	1.8270	h	0.36	1.0490E+15	2.988	1.2840	0.4639	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.6476E+15	0.2449	0.2570	0.0053	0.0183	0.0000
S-35	87.310	d	0.18	8.3111E+16	0.2064	0.0000	0.0486	0.0000	0.0000
Xe-125	16.900	h	1.18	3.1964E+14	9.8422E-02	0.2690	0.0323	0.0013	0.0000
Xe-131m	11.930	d	0.13	2.2596E+15	4.1067E-02	0.0200	0.1430	0.0000	0.0000
Xe-133m	2.1880	d	0.50	3.4081E+14	3.3773E-02	0.0414	0.1920	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.6109E+14	2.7334E-02	0.0463	0.1360	0.0000	0.0000
Kr-85m	4.4810	h	0.18	1.3523E+13	1.5705E-02	0.1570	0.2282	0.0000	0.0000
Xe-129m	8.8800	d	0.23	4.9708E+14	1.2137E-02	0.0513	0.1830	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.3859E+13	7.8914E-03	0.2490	0.3190	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4097E+17	6.7869E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.2231E+15	4.4639E-03	0.0424	0.0179	0.0000	0.0000
Kr-83m	1.8300	h	1.09	1.3278E+11	3.7758E-04	0.0026	0.0382	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4465E+15	3.5599E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.3877E+13	1.4223E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.4889E+12	6.7264E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	2.5638E+11	3.7764E-05	2.6600	0.1439	0.0000	0.0000
Se-75	119.70	d	0.20	9.3237E+12	1.6889E-05	0.3889	0.0000	0.0000	0.0000
I-133	20.800	h	0.48	5.0444E+10	1.2620E-05	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	6.2196E+10	1.0789E-05	1.4200	0.0523	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-127	9.3500	h	0.64	7.7573E+09	4.3174E-06	0.0050	0.2245	0.0000	0.0000
Te-129m	33.600	d	0.30	5.3736E+11	3.4677E-06	0.0373	0.2660	0.0000	0.0000
I-124	4.1760	d	0.01	6.5215E+10	3.3861E-06	1.0900	0.0065	0.1880	0.0000
Br-80	17.600	m	0.28	1.8270E+08	3.2411E-06	0.0800	0.7182	0.0081	0.0000
Cs-137	30.041	y	0.10	1.6268E+14	3.2149E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4805E+07	3.0348E-06	0.5990	0.0652	0.0000	0.0000
Br-80m	4.4110	h	0.23	2.5646E+09	3.0256E-06	0.0240	0.0000	0.0000	0.0000
Te-131	25.000	m	0.40	1.8396E+08	2.2975E-06	0.4220	0.7210	0.0000	0.0000
Te-129	1.1600	h	0.29	4.8769E+08	2.1878E-06	0.0631	0.5420	0.0000	0.0000
Br-83	2.4000	h	0.83	8.6384E+08	1.8730E-06	0.0065	0.3249	0.0000	0.0000
Br-77	2.3760	d	0.01	4.5022E+09	4.1086E-07	0.3360	0.0000	0.0011	0.0000
Te-125m	57.400	d	0.26	9.2299E+10	3.4865E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2719E+11	2.5301E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.6401E+10	1.8560E-07	0.5770	0.0091	0.0000	0.0000
I-130	12.360	h	0.08	4.2982E+08	1.8096E-07	2.1400	0.2960	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.4316E+09	1.2424E-07	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.7145E+10	2.4124E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.9246E+09	1.4391E-08	0.1480	0.1020	0.0000	0.0000
I-123	13.220	h	0.03	1.8230E+07	7.1757E-09	0.1723	0.0276	0.0000	0.0000
I-132	2.2950	h	0.57	2.5676E+06	5.8218E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	8.0628E+07	5.4563E-09	0.2340	0.1020	0.0000	0.0000
Kr-87	1.2720	h	0.79	7.4076E+05	3.0305E-09	0.7960	1.3380	0.0000	0.0000
Br-76	16.200	h	1.24	4.3630E+06	1.4015E-09	2.7800	0.0000	0.6515	0.0000
I-135	6.5690	h	0.30	8.2062E+05	6.5008E-10	1.6500	0.3770	0.0000	0.0000
Si-31	2.6200	h	0.38	2.2324E+05	4.4341E-10	0.0018	0.5952	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 128
Total activity (Ci) = 498.62

Total number of decays = 2.42333E+11
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15265
Average chain length = 1.0000

Average gamma E (MeV) = 8.04690E-03
Average beta E (MeV) = 2.05321E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 0.147230759 R/hr per Ci/m2
Composite ECF per FGR table = 0.140572697 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.100586303 Rem/hr per Ci/m2

Air Source

Point in time = 2.00960112 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.2875E+19	327.3	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.2848E+16	0.2057	0.0000	0.0486	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.3621E+15	0.2024	0.2570	0.0053	0.0183	0.0000
Ar-41	1.8270	h	0.36	2.7354E+13	7.7911E-02	1.2840	0.4639	0.0000	0.0000
Xe-125	16.900	h	1.18	2.1550E+14	6.6356E-02	0.2690	0.0323	0.0013	0.0000
Xe-131m	11.930	d	0.13	2.2076E+15	4.0123E-02	0.0200	0.1430	0.0000	0.0000
Xe-133m	2.1880	d	0.50	3.0020E+14	2.9749E-02	0.0414	0.1920	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.6655E+14	2.7560E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	4.8178E+14	1.1764E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4096E+17	6.7864E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.3213E+15	4.8222E-03	0.0424	0.0179	0.0000	0.0000
Xe-135	9.1390	h	0.22	6.6852E+12	3.8066E-03	0.2490	0.3190	0.0000	0.0000
Kr-85m	4.4810	h	0.18	3.0573E+12	3.5505E-03	0.1570	0.2282	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4483E+15	3.5609E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.3696E+13	1.4115E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.4165E+12	6.5306E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	2.1231E+11	3.1273E-05	2.6600	0.1439	0.0000	0.0000
Se-75	119.70	d	0.20	9.3021E+12	1.6850E-05	0.3889	0.0000	0.0000	0.0000
Kr-83m	1.8300	h	1.09	3.5830E+09	1.0189E-05	0.0026	0.0382	0.0000	0.0000
I-133	20.800	h	0.48	3.6618E+10	9.1612E-06	0.6080	0.4100	0.0000	0.0000
Te-131m	1.2500	d	0.64	4.9809E+10	8.6400E-06	1.4200	0.0523	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-129m	33.600	d	0.30	5.3294E+11	3.4391E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6268E+14	3.2148E-06	0.0015	0.2500	0.0000	0.0000
I-124	4.1760	d	0.01	6.1020E+10	3.1683E-06	1.0900	0.0065	0.1880	0.0000
Ba-137m	2.5520	m	0.04	2.4804E+07	3.0347E-06	0.5990	0.0652	0.0000	0.0000
Te-127	9.3500	h	0.64	4.0298E+09	2.2428E-06	0.0050	0.2245	0.0000	0.0000
Te-129	1.1600	h	0.29	4.8367E+08	2.1698E-06	0.0631	0.5420	0.0000	0.0000
Te-131	25.000	m	0.40	1.4732E+08	1.8399E-06	0.4220	0.7210	0.0000	0.0000
Br-80	17.600	m	0.28	4.0341E+07	7.1567E-07	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	5.6629E+08	6.6807E-07	0.0240	0.0000	0.0000	0.0000
Br-77	2.3760	d	0.01	4.0058E+09	3.6555E-07	0.3360	0.0000	0.0011	0.0000
Te-125m	57.400	d	0.26	9.1854E+10	3.4697E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2687E+11	2.5237E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.6192E+10	1.8324E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.2743E+09	1.2161E-07	0.4330	0.1400	0.0055	0.0000
Br-83	2.4000	h	0.83	5.3801E+07	1.1665E-07	0.0065	0.3249	0.0000	0.0000
I-130	12.360	h	0.08	2.5072E+08	1.0556E-07	2.1400	0.2960	0.0000	0.0000
Te-121m	154.10	d	4.54	1.7115E+10	2.4081E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.9062E+09	1.4357E-08	0.1480	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	2.2793E+06	5.1683E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	7.3936E+07	5.0035E-09	0.2340	0.1020	0.0000	0.0000
I-123	13.220	h	0.03	1.1013E+07	4.3351E-09	0.1723	0.0276	0.0000	0.0000
Br-76	16.200	h	1.24	2.8918E+06	9.2892E-10	2.7800	0.0000	0.6515	0.0000
I-135	6.5690	h	0.30	2.9762E+05	2.3576E-10	1.6500	0.3770	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.4971E+14	6.4452E-11	0.0000	0.0560	0.0000	0.0000
Xe-135m	15.290	m	0.33	1983.	4.0496E-11	0.4320	0.0984	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 126
Total activity (Ci) = 493.01

Total number of decays = 2.42396E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15269
Average chain length = 1.0000

Average gamma E (MeV) = 5.12442E-04
Average beta E (MeV) = 1.80028E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 6.47662906E-03 R/hr per Ci/m2
Composite ECF per FGR table = 6.54251035E-03 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.40552770E-03 Rem/hr per Ci/m2

Air Source

Point in time = 2.50979114 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.2354E+19	324.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.2519E+16	0.2049	0.0000	0.0486	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.0740E+15	0.1596	0.2570	0.0053	0.0183	0.0000
Xe-125	16.900	h	1.18	1.3171E+14	4.0555E-02	0.2690	0.0323	0.0013	0.0000
Xe-131m	11.930	d	0.13	2.1444E+15	3.8973E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.6645E+14	2.7556E-02	0.0463	0.1360	0.0000	0.0000
Xe-133m	2.1880	d	0.50	2.5621E+14	2.5389E-02	0.0414	0.1920	0.0000	0.0000
Xe-129m	8.8800	d	0.23	4.6333E+14	1.1313E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4095E+17	6.7859E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.3971E+15	5.0990E-03	0.0424	0.0179	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.6897E+12	1.5315E-03	0.2490	0.3190	0.0000	0.0000
Ar-41	1.8270	h	0.36	2.8778E+11	8.1967E-04	1.2840	0.4639	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.7740E+11	5.5441E-04	0.1570	0.2282	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4483E+15	3.5609E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.3471E+13	1.3981E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.3261E+12	6.2864E-05	0.3823	0.1920	0.0000	0.0000
Br-82	1.4720	d	0.08	1.6776E+11	2.4711E-05	2.6600	0.1439	0.0000	0.0000
Se-75	119.70	d	0.20	9.2752E+12	1.6801E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-131m	1.2500	d	0.64	3.7745E+10	6.5472E-06	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	2.4545E+10	6.1407E-06	0.6080	0.4100	0.0000	0.0000
Te-129m	33.600	d	0.30	5.2747E+11	3.4038E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6267E+14	3.2147E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4804E+07	3.0346E-06	0.5990	0.0652	0.0000	0.0000
I-124	4.1760	d	0.01	5.6159E+10	2.9159E-06	1.0900	0.0065	0.1880	0.0000
Te-129	1.1600	h	0.29	4.7871E+08	2.1475E-06	0.0631	0.5420	0.0000	0.0000
Te-131	25.000	m	0.40	1.1164E+08	1.3943E-06	0.4220	0.7210	0.0000	0.0000
Te-127	9.3500	h	0.64	1.9153E+09	1.0660E-06	0.0050	0.2245	0.0000	0.0000
Te-125m	57.400	d	0.26	9.1301E+10	3.4488E-07	0.0360	0.1110	0.0000	0.0000
Br-77	2.3760	d	0.01	3.4619E+09	3.1592E-07	0.3360	0.0000	0.0011	0.0000
Te-127m	109.00	d	1.84	1.2647E+11	2.5157E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.5935E+10	1.8033E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	7.0824E+09	1.1840E-07	0.4330	0.1400	0.0055	0.0000
Kr-83m	1.8300	h	1.09	4.1534E+07	1.1811E-07	0.0026	0.0382	0.0000	0.0000
Br-80	17.600	m	0.28	6.1164E+06	1.0851E-07	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	8.5859E+07	1.0129E-07	0.0240	0.0000	0.0000	0.0000
I-130	12.360	h	0.08	1.2788E+08	5.3841E-08	2.1400	0.2960	0.0000	0.0000
Te-121m	154.10	d	4.54	1.7076E+10	2.4027E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.8833E+09	1.4316E-08	0.1480	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	2.0414E+06	4.6288E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	6.6353E+07	4.4903E-09	0.2340	0.1020	0.0000	0.0000
Br-83	2.4000	h	0.83	1.6791E+06	3.6406E-09	0.0065	0.3249	0.0000	0.0000
I-123	13.220	h	0.03	5.8688E+06	2.3102E-09	0.1723	0.0276	0.0000	0.0000
Br-76	16.200	h	1.24	1.7302E+06	5.5579E-10	2.7800	0.0000	0.6515	0.0000
I-135	6.5690	h	0.30	8.3857E+04	6.6429E-11	1.6500	0.3770	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5371E+14	6.5483E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 126
Total activity (Ci) = 489.63

Total number of decays = 2.42474E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15274
Average chain length = 1.0000

Average gamma E (MeV) = 2.73051E-04
Average beta E (MeV) = 1.80324E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.11069360E-03 R/hr per Ci/m2
Composite ECF per FGR table = 2.26750714E-03 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.41313495E-03 Rem/hr per Ci/m2

Air Source

Point in time = 3.13448501 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.1711E+19	320.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.2111E+16	0.2039	0.0000	0.0486	0.0000	0.0000
Kr-79	1.4590	d	0.29	7.9821E+14	0.1186	0.2570	0.0053	0.0183	0.0000
Xe-131m	11.930	d	0.13	2.0679E+15	3.7584E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.5773E+14	2.7195E-02	0.0463	0.1360	0.0000	0.0000
Xe-125	16.900	h	1.18	7.1213E+13	2.1928E-02	0.2690	0.0323	0.0013	0.0000
Xe-133m	2.1880	d	0.50	2.1021E+14	2.0831E-02	0.0414	0.1920	0.0000	0.0000
Xe-129m	8.8800	d	0.23	4.4128E+14	1.0775E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0863E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4093E+17	6.7853E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.4472E+15	5.2819E-03	0.0424	0.0179	0.0000	0.0000
Xe-135	9.1390	h	0.22	8.6269E+11	4.9122E-04	0.2490	0.3190	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4477E+15	3.5605E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.3194E+13	1.3816E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	2.2147E+12	5.9852E-05	0.3823	0.1920	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.6956E+10	5.4530E-05	0.1570	0.2282	0.0000	0.0000
Br-82	1.4720	d	0.08	1.2501E+11	1.8413E-05	2.6600	0.1439	0.0000	0.0000
Se-75	119.70	d	0.20	9.2417E+12	1.6741E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-131m	1.2500	d	0.64	2.6694E+10	4.6303E-06	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	1.4893E+10	3.7259E-06	0.6080	0.4100	0.0000	0.0000
Te-129m	33.600	d	0.30	5.2072E+11	3.3603E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6267E+14	3.2146E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4803E+07	3.0345E-06	0.5990	0.0652	0.0000	0.0000
Ar-41	1.8270	h	0.36	9.7444E+08	2.7755E-06	1.2840	0.4639	0.0000	0.0000
I-124	4.1760	d	0.01	5.0627E+10	2.6287E-06	1.0900	0.0065	0.1880	0.0000
Te-129	1.1600	h	0.29	4.7258E+08	2.1200E-06	0.0631	0.5420	0.0000	0.0000
Te-131	25.000	m	0.40	7.8954E+07	9.8607E-07	0.4220	0.7210	0.0000	0.0000
Te-127	9.3500	h	0.64	9.2557E+08	5.1513E-07	0.0050	0.2245	0.0000	0.0000
Te-125m	57.400	d	0.26	9.0614E+10	3.4229E-07	0.0360	0.1110	0.0000	0.0000
Br-77	2.3760	d	0.01	2.8851E+09	2.6329E-07	0.3360	0.0000	0.0011	0.0000
Te-127m	109.00	d	1.84	1.2596E+11	2.5057E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.5621E+10	1.7678E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	6.8498E+09	1.1451E-07	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.7028E+10	2.3959E-08	0.2171	0.0769	0.0000	0.0000
I-130	12.360	h	0.08	5.5165E+07	2.3225E-08	2.1400	0.2960	0.0000	0.0000
Te-123m	119.40	d	0.08	7.8548E+09	1.4264E-08	0.1480	0.1020	0.0000	0.0000
Br-80	17.600	m	0.28	5.7985E+05	1.0287E-08	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	8.1397E+06	9.6027E-09	0.0240	0.0000	0.0000	0.0000
I-132	2.2950	h	0.57	1.7832E+06	4.0434E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	5.7965E+07	3.9227E-09	0.2340	0.1020	0.0000	0.0000
I-123	13.220	h	0.03	2.6740E+06	1.0526E-09	0.1723	0.0276	0.0000	0.0000
Kr-83m	1.8300	h	1.09	1.9446E+05	5.5298E-10	0.0026	0.0382	0.0000	0.0000
Br-76	16.200	h	1.24	9.1098E+05	2.9263E-10	2.7800	0.0000	0.6515	0.0000
Cs-135	0.23000E+07	y	13.04	2.5554E+14	6.5955E-11	0.0000	0.0560	0.0000	0.0000
Br-83	2.4000	h	0.83	2.2108E+04	4.7936E-11	0.0065	0.3249	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
I-135	6.5690	h	0.30	1.7238E+04	1.3656E-11	1.6500	0.3770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 126
Total activity (Ci) = 485.58

Total number of decays = 2.42572E+11
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15280
Average chain length = 1.0000

Average gamma E (MeV) = 2.38007E-04
Average beta E (MeV) = 1.81594E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.54891622E-03 R/hr per Ci/m2
Composite ECF per FGR table = 1.63427216E-03 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.97508365E-03 Rem/hr per Ci/m2

Air Source

Point in time = 3.91466618 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	5.0919E+19	315.2	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.1604E+16	0.2027	0.0000	0.0486	0.0000	0.0000
Kr-79	1.4590	d	0.29	5.5099E+14	8.1884E-02	0.2570	0.0053	0.0183	0.0000
Xe-131m	11.930	d	0.13	1.9763E+15	3.5919E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.3693E+14	2.6335E-02	0.0463	0.1360	0.0000	0.0000
Xe-133m	2.1880	d	0.50	1.6417E+14	1.6269E-02	0.0414	0.1920	0.0000	0.0000
Xe-125	16.900	h	1.18	3.3039E+13	1.0173E-02	0.2690	0.0323	0.0013	0.0000
Xe-129m	8.8800	d	0.23	4.1521E+14	1.0138E-02	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2111E+18	7.0862E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4092E+17	6.7844E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.4721E+15	5.3726E-03	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4468E+15	3.5600E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.2852E+13	1.3612E-04	0.2710	0.0307	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.0849E+11	1.1872E-04	0.2490	0.3190	0.0000	0.0000
I-131	8.0230	d	0.02	2.0794E+12	5.6196E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	9.2001E+12	1.6665E-05	0.3889	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	8.6572E+10	1.2752E-05	2.6600	0.1439	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-129m	33.600	d	0.30	5.1240E+11	3.3066E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6266E+14	3.2144E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4801E+07	3.0344E-06	0.5990	0.0652	0.0000	0.0000
Kr-85m	4.4810	h	0.18	2.5930E+09	3.0113E-06	0.1570	0.2282	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.7319E+10	3.0042E-06	1.4200	0.0523	0.0000	0.0000
I-124	4.1760	d	0.01	4.4478E+10	2.3094E-06	1.0900	0.0065	0.1880	0.0000
Te-129	1.1600	h	0.29	4.6503E+08	2.0862E-06	0.0631	0.5420	0.0000	0.0000
I-133	20.800	h	0.48	7.9797E+09	1.9964E-06	0.6080	0.4100	0.0000	0.0000
Te-131	25.000	m	0.40	5.1226E+07	6.3976E-07	0.4220	0.7210	0.0000	0.0000
Te-125m	57.400	d	0.26	8.9765E+10	3.3908E-07	0.0360	0.1110	0.0000	0.0000
Te-127	9.3500	h	0.64	5.5973E+08	3.1152E-07	0.0050	0.2245	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2534E+11	2.4933E-07	0.0111	0.0821	0.0000	0.0000
Br-77	2.3760	d	0.01	2.2978E+09	2.0969E-07	0.3360	0.0000	0.0011	0.0000
Te-121	19.160	d	0.26	1.5239E+10	1.7245E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	6.5701E+09	1.0984E-07	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.6969E+10	2.3876E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.8193E+09	1.4199E-08	0.1480	0.1020	0.0000	0.0000
I-130	12.360	h	0.08	1.9303E+07	8.1270E-09	2.1400	0.2960	0.0000	0.0000
I-132	2.2950	h	0.57	1.5063E+06	3.4154E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	4.8963E+07	3.3135E-09	0.2340	0.1020	0.0000	0.0000
Ar-41	1.8270	h	0.36	8.0093E+05	2.2813E-09	1.2840	0.4639	0.0000	0.0000
Br-80	17.600	m	0.28	3.0582E+04	5.4254E-10	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	4.2930E+05	5.0646E-10	0.0240	0.0000	0.0000	0.0000
I-123	13.220	h	0.03	1.0018E+06	3.9435E-10	0.1723	0.0276	0.0000	0.0000
Br-76	16.200	h	1.24	4.0886E+05	1.3133E-10	2.7800	0.0000	0.6515	0.0000
Cs-135	0.23000E+07	y	13.04	2.5619E+14	6.6124E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-135	6.5690	h	0.30	2390.	1.8934E-12	1.6500	0.3770	0.0000	0.0000
Kr-83m	1.8300	h	1.09	420.5	1.1959E-12	0.0026	0.0382	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 126
Total activity (Ci) = 480.62

Total number of decays = 2.42692E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15288
Average chain length = 1.0000

Average gamma E (MeV) = 2.11027E-04
Average beta E (MeV) = 1.83213E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.12212857E-03 R/hr per Ci/m2
Composite ECF per FGR table = 1.15226675E-03 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.63783545E-03 Rem/hr per Ci/m2

Air Source

Point in time = 4.88902712 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.9947E+19	309.2	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.0975E+16	0.2011	0.0000	0.0486	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.4682E+14	5.1542E-02	0.2570	0.0053	0.0183	0.0000
Xe-131m	11.930	d	0.13	1.8675E+15	3.3942E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	6.0074E+14	2.4839E-02	0.0463	0.1360	0.0000	0.0000
Xe-133m	2.1880	d	0.50	1.2057E+14	1.1949E-02	0.0414	0.1920	0.0000	0.0000
Xe-129m	8.8800	d	0.23	3.8480E+14	9.3957E-03	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0862E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4089E+17	6.7834E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.4757E+15	5.3858E-03	0.0424	0.0179	0.0000	0.0000
Xe-125	16.900	h	1.18	1.2662E+13	3.8988E-03	0.2690	0.0323	0.0013	0.0000
Kr-85	10.750	y	0.21	6.4457E+15	3.5594E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.2432E+13	1.3362E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	1.9184E+12	5.1846E-05	0.3823	0.1920	0.0000	0.0000
Xe-135	9.1390	h	0.22	3.5385E+10	2.0149E-05	0.2490	0.3190	0.0000	0.0000
Se-75	119.70	d	0.20	9.1483E+12	1.6571E-05	0.3889	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	5.4716E+10	8.0597E-06	2.6600	0.1439	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Te-129m	33.600	d	0.30	5.0221E+11	3.2408E-06	0.0373	0.2660	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6265E+14	3.2142E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4800E+07	3.0342E-06	0.5990	0.0652	0.0000	0.0000
Te-129	1.1600	h	0.29	4.5578E+08	2.0446E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	3.7836E+10	1.9645E-06	1.0900	0.0065	0.1880	0.0000
Te-131m	1.2500	d	0.64	1.0090E+10	1.7502E-06	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	3.6606E+09	9.1581E-07	0.6080	0.4100	0.0000	0.0000
Te-131	25.000	m	0.40	2.9843E+07	3.7271E-07	0.4220	0.7210	0.0000	0.0000
Te-125m	57.400	d	0.26	8.8715E+10	3.3511E-07	0.0360	0.1110	0.0000	0.0000
Te-127	9.3500	h	0.64	4.5746E+08	2.5460E-07	0.0050	0.2245	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2457E+11	2.4779E-07	0.0111	0.0821	0.0000	0.0000
Te-121	19.160	d	0.26	1.4776E+10	1.6721E-07	0.5770	0.0091	0.0000	0.0000
Br-77	2.3760	d	0.01	1.7293E+09	1.5781E-07	0.3360	0.0000	0.0011	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-126	12.970	d	0.39	6.2368E+09	1.0426E-07	0.4330	0.1400	0.0055	0.0000
Kr-85m	4.4810	h	0.18	6.9637E+07	8.0870E-08	0.1570	0.2282	0.0000	0.0000
Te-121m	154.10	d	4.54	1.6894E+10	2.3771E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.7752E+09	1.4119E-08	0.1480	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	1.2200E+06	2.7663E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	3.9657E+07	2.6837E-09	0.2340	0.1020	0.0000	0.0000
I-130	12.360	h	0.08	5.2010E+06	2.1897E-09	2.1400	0.2960	0.0000	0.0000
I-123	13.220	h	0.03	2.9397E+05	1.1572E-10	0.1723	0.0276	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5636E+14	6.6168E-11	0.0000	0.0560	0.0000	0.0000
Br-76	16.200	h	1.24	1.5033E+05	4.8288E-11	2.7800	0.0000	0.6515	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Br-80	17.600	m	0.28	775.5	1.3757E-11	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	1.0886E+04	1.2843E-11	0.0240	0.0000	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Ar-41	1.8270	h	0.36	112.3	3.2000E-13	1.2840	0.4639	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.3843E+12	2.3540E-13	0.0248	0.0556	0.0000	0.0000
I-135	6.5690	h	0.30	202.7	1.6056E-13	1.6500	0.3770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228207D+24

Total number of nuclides = 125
Total activity (Ci) = 474.55

Total number of decays = 2.42841E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15297
Average chain length = 1.0000

Average gamma E (MeV) = 1.90043E-04
Average beta E (MeV) = 1.85257E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.92181061E-04 R/hr per Ci/m2
Composite ECF per FGR table = 7.85141950E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.37553357E-03 Rem/hr per Ci/m2

Air Source

Point in time = 6.10591888 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.8758E+19	301.8	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	8.0197E+16	0.1992	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	1.7400E+15	3.1625E-02	0.0200	0.1430	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.9455E+14	2.8913E-02	0.2570	0.0053	0.0183	0.0000
Xe-133	5.2440	d	0.08	5.4693E+14	2.2614E-02	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	3.4993E+14	8.5443E-03	0.0513	0.1830	0.0000	0.0000
Xe-133m	2.1880	d	0.50	8.2003E+13	8.1263E-03	0.0414	0.1920	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0861E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4087E+17	6.7822E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.4637E+15	5.3418E-03	0.0424	0.0179	0.0000	0.0000
Xe-125	16.900	h	1.18	3.8219E+12	1.1768E-03	0.2690	0.0323	0.0013	0.0000
Kr-85	10.750	y	0.21	6.4443E+15	3.5587E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.1918E+13	1.3056E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	1.7317E+12	4.6799E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	9.0841E+12	1.6455E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Br-82	1.4720	d	0.08	3.0850E+10	4.5442E-06	2.6600	0.1439	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6264E+14	3.2140E-06	0.0015	0.2500	0.0000	0.0000
Te-129m	33.600	d	0.30	4.8976E+11	3.1605E-06	0.0373	0.2660	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4798E+07	3.0339E-06	0.5990	0.0652	0.0000	0.0000
Xe-135	9.1390	h	0.22	3.8621E+09	2.1991E-06	0.2490	0.3190	0.0000	0.0000
Te-129	1.1600	h	0.29	4.4448E+08	1.9940E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	3.0916E+10	1.6052E-06	1.0900	0.0065	0.1880	0.0000
Te-131m	1.2500	d	0.64	5.1383E+09	8.9129E-07	1.4200	0.0523	0.0000	0.0000
I-133	20.800	h	0.48	1.3832E+09	3.4604E-07	0.6080	0.4100	0.0000	0.0000
Te-125m	57.400	d	0.26	8.7421E+10	3.3023E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2361E+11	2.4588E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	4.3518E+08	2.4220E-07	0.0050	0.2245	0.0000	0.0000
Te-131	25.000	m	0.40	1.5198E+07	1.8981E-07	0.4220	0.7210	0.0000	0.0000
Te-121	19.160	d	0.26	1.4219E+10	1.6091E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Br-77	2.3760	d	0.01	1.2125E+09	1.1065E-07	0.3360	0.0000	0.0011	0.0000
I-126	12.970	d	0.39	5.8441E+09	9.7698E-08	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.6802E+10	2.3641E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.7204E+09	1.4020E-08	0.1480	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	9.3762E+05	2.1260E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	3.0478E+07	2.0626E-09	0.2340	0.1020	0.0000	0.0000
Kr-85m	4.4810	h	0.18	7.6005E+05	8.8265E-10	0.1570	0.2282	0.0000	0.0000
I-130	12.360	h	0.08	1.0111E+06	4.2568E-10	2.1400	0.2960	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6176E-11	0.0000	0.0560	0.0000	0.0000
I-123	13.220	h	0.03	6.3573E+04	2.5024E-11	0.1723	0.0276	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Br-76	16.200	h	1.24	4.3086E+04	1.3840E-11	2.7800	0.0000	0.6515	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.3968E+12	2.3586E-13	0.0248	0.0556	0.0000	0.0000
Br-80	17.600	m	0.28	7.879	1.3977E-13	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	110.6	1.3047E-13	0.0240	0.0000	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
I-135	6.5690	h	0.30	9.299	7.3666E-15	1.6500	0.3770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 124
Total activity (Ci) = 467.16

Total number of decays = 2.43024E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15309
Average chain length = 1.0000

Average gamma E (MeV) = 1.74616E-04
Average beta E (MeV) = 1.87836E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 5.52758866E-04 R/hr per Ci/m2
Composite ECF per FGR table = 5.25402196E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.18269788E-03 Rem/hr per Ci/m2

Air Source

Point in time = 7.62569809 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.7314E+19	292.9	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.9235E+16	0.1968	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	1.5930E+15	2.8952E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	4.7556E+14	1.9663E-02	0.0463	0.1360	0.0000	0.0000
Kr-79	1.4590	d	0.29	9.4507E+13	1.4045E-02	0.2570	0.0053	0.0183	0.0000
Xe-129m	8.8800	d	0.23	3.1079E+14	7.5885E-03	0.0513	0.1830	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2110E+18	7.0860E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4083E+17	6.7806E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.4409E+15	5.2587E-03	0.0424	0.0179	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.0668E+13	5.0211E-03	0.0414	0.1920	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4426E+15	3.5577E-04	0.0022	0.2507	0.0000	0.0000
Xe-125	16.900	h	1.18	8.5619E+11	2.6364E-04	0.2690	0.0323	0.0013	0.0000
Xe-127	36.400	d	0.27	2.1293E+13	1.2683E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	1.5213E+12	4.1114E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	9.0045E+12	1.6311E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6262E+14	3.2136E-06	0.0015	0.2500	0.0000	0.0000
Te-129m	33.600	d	0.30	4.7464E+11	3.0629E-06	0.0373	0.2660	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4796E+07	3.0337E-06	0.5990	0.0652	0.0000	0.0000
Br-82	1.4720	d	0.08	1.5082E+10	2.2216E-06	2.6600	0.1439	0.0000	0.0000
Te-129	1.1600	h	0.29	4.3076E+08	1.9324E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	2.4023E+10	1.2473E-06	1.0900	0.0065	0.1880	0.0000
Te-131m	1.2500	d	0.64	2.2122E+09	3.8373E-07	1.4200	0.0523	0.0000	0.0000
Te-125m	57.400	d	0.26	8.5831E+10	3.2422E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2242E+11	2.4352E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	4.2873E+08	2.3861E-07	0.0050	0.2245	0.0000	0.0000
Te-121	19.160	d	0.26	1.3557E+10	1.5342E-07	0.5770	0.0091	0.0000	0.0000
Xe-135	9.1390	h	0.22	2.4287E+08	1.3829E-07	0.2490	0.3190	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
I-133	20.800	h	0.48	4.1019E+08	1.0262E-07	0.6080	0.4100	0.0000	0.0000
I-126	12.970	d	0.39	5.3882E+09	9.0076E-08	0.4330	0.1400	0.0055	0.0000
Te-131	25.000	m	0.40	6.5431E+06	8.1717E-08	0.4220	0.7210	0.0000	0.0000
Br-77	2.3760	d	0.01	7.7830E+08	7.1025E-08	0.3360	0.0000	0.0011	0.0000
Te-121m	154.10	d	4.54	1.6688E+10	2.3480E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.6526E+09	1.3897E-08	0.1480	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	6.7489E+05	1.5303E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	2.1938E+07	1.4846E-09	0.2340	0.1020	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
I-130	12.360	h	0.08	1.3075E+05	5.5048E-11	2.1400	0.2960	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-123	13.220	h	0.03	9391.	3.6966E-12	0.1723	0.0276	0.0000	0.0000
Kr-85m	4.4810	h	0.18	2695.	3.1293E-12	0.1570	0.2282	0.0000	0.0000
Br-76	16.200	h	1.24	9048.	2.9065E-12	2.7800	0.0000	0.6515	0.0000
I-129	0.16100E+08	y	4.35	6.4119E+12	2.3642E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Br-80	17.600	m	0.28	2.5540E-02	4.5308E-16	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	0.3585	4.2295E-16	0.0240	0.0000	0.0000	0.0000
I-135	6.5690	h	0.30	0.1981	1.5696E-16	1.6500	0.3770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 122
Total activity (Ci) = 458.19

Total number of decays = 2.43249E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15323
Average chain length = 1.0000

Average gamma E (MeV) = 1.63836E-04
Average beta E (MeV) = 1.91092E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.90353583E-04 R/hr per Ci/m2
Composite ECF per FGR table = 3.57238430E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.04794481E-03 Rem/hr per Ci/m2

Air Source

Point in time = 9.52373600 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.5570E+19	282.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.8050E+16	0.1938	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	1.4267E+15	2.5929E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	3.9004E+14	1.6127E-02	0.0463	0.1360	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2109E+18	7.0859E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4079E+17	6.7786E-03	0.0000	0.0057	0.0000	0.0000
Xe-129m	8.8800	d	0.23	2.6799E+14	6.5436E-03	0.0513	0.1830	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.8357E+13	5.7004E-03	0.2570	0.0053	0.0183	0.0000
I-125	59.410	d	0.02	1.4100E+15	5.1461E-03	0.0424	0.0179	0.0000	0.0000
Xe-133m	2.1880	d	0.50	2.7771E+13	2.7521E-03	0.0414	0.1920	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4404E+15	3.5565E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	2.0537E+13	1.2233E-04	0.2710	0.0307	0.0000	0.0000
Xe-125	16.900	h	1.18	1.3218E+11	4.0700E-05	0.2690	0.0323	0.0013	0.0000
I-131	8.0230	d	0.02	1.2925E+12	3.4931E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	8.9060E+12	1.6132E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6260E+14	3.2133E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4793E+07	3.0333E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	4.5641E+11	2.9453E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	4.1422E+08	1.8582E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	1.7531E+10	9.1025E-07	1.0900	0.0065	0.1880	0.0000
Br-82	1.4720	d	0.08	6.1702E+09	9.0887E-07	2.6600	0.1439	0.0000	0.0000
Te-125m	57.400	d	0.26	8.3886E+10	3.1687E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.2095E+11	2.4059E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	4.2343E+08	2.3567E-07	0.0050	0.2245	0.0000	0.0000
Te-121	19.160	d	0.26	1.2779E+10	1.4462E-07	0.5770	0.0091	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-131m	1.2500	d	0.64	7.7220E+08	1.3395E-07	1.4200	0.0523	0.0000	0.0000
I-126	12.970	d	0.39	4.8684E+09	8.1388E-08	0.4330	0.1400	0.0055	0.0000
Br-77	2.3760	d	0.01	4.4738E+08	4.0826E-08	0.3360	0.0000	0.0011	0.0000
Te-131	25.000	m	0.40	2.2840E+06	2.8525E-08	0.4220	0.7210	0.0000	0.0000
Te-121m	154.10	d	4.54	1.6546E+10	2.3281E-08	0.2171	0.0769	0.0000	0.0000
I-133	20.800	h	0.48	8.9891E+07	2.2489E-08	0.6080	0.4100	0.0000	0.0000
Te-123m	119.40	d	0.08	7.5688E+09	1.3745E-08	0.1480	0.1020	0.0000	0.0000
Xe-135	9.1390	h	0.22	7.6720E+06	4.3685E-09	0.2490	0.3190	0.0000	0.0000
I-132	2.2950	h	0.57	4.4762E+05	1.0150E-09	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	1.4550E+07	9.8466E-10	0.2340	0.1020	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-130	12.360	h	0.08	1.0162E+04	4.2785E-12	2.1400	0.2960	0.0000	0.0000
Br-76	16.200	h	1.24	1289.	4.1390E-13	2.7800	0.0000	0.6515	0.0000
I-123	13.220	h	0.03	861.9	3.3926E-13	0.1723	0.0276	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.4302E+12	2.3709E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Kr-85m	4.4810	h	0.18	2.346	2.7242E-15	0.1570	0.2282	0.0000	0.0000
I-135	6.5690	h	0.30	1.6198E-03	1.2832E-18	1.6500	0.3770	0.0000	0.0000
Br-80	17.600	m	0.28	1.9881E-05	3.5270E-19	0.0800	0.7182	0.0081	0.0000
Br-80m	4.4110	h	0.23	2.7908E-04	3.2925E-19	0.0240	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 121
Total activity (Ci) = 447.38

Total number of decays = 2.43524E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15340
Average chain length = 1.0000

Average gamma E (MeV) = 1.56460E-04
Average beta E (MeV) = 1.95204E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.86616152E-04 R/hr per Ci/m2
Composite ECF per FGR table = 2.59297783E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.95574900E-03 Rem/hr per Ci/m2

Air Source

Point in time = 11.8942184 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.3482E+19	269.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.6595E+16	0.1902	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	1.2431E+15	2.2593E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	2.9747E+14	1.2300E-02	0.0463	0.1360	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2109E+18	7.0858E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4074E+17	6.7761E-03	0.0000	0.0057	0.0000	0.0000
Xe-129m	8.8800	d	0.23	2.2272E+14	5.4382E-03	0.0513	0.1830	0.0000	0.0000
I-125	59.410	d	0.02	1.3717E+15	5.0061E-03	0.0424	0.0179	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.2438E+13	1.8485E-03	0.2570	0.0053	0.0183	0.0000
Xe-133m	2.1880	d	0.50	1.3106E+13	1.2987E-03	0.0414	0.1920	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4377E+15	3.5550E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	1.9630E+13	1.1693E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	1.0537E+12	2.8476E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	8.7846E+12	1.5913E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Xe-125	16.900	h	1.18	1.2817E+10	3.9466E-06	0.2690	0.0323	0.0013	0.0000
Cs-137	30.041	y	0.10	1.6258E+14	3.2128E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4789E+07	3.0328E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	4.3463E+11	2.8047E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	3.9445E+08	1.7695E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	1.1829E+10	6.1416E-07	1.0900	0.0065	0.1880	0.0000
Te-125m	57.400	d	0.26	8.1519E+10	3.0793E-07	0.0360	0.1110	0.0000	0.0000
Br-82	1.4720	d	0.08	2.0208E+09	2.9767E-07	2.6600	0.1439	0.0000	0.0000
Te-127m	109.00	d	1.84	1.1914E+11	2.3699E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	4.1709E+08	2.3214E-07	0.0050	0.2245	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	1.1878E+10	1.3442E-07	0.5770	0.0091	0.0000	0.0000
I-126	12.970	d	0.39	4.2891E+09	7.1703E-08	0.4330	0.1400	0.0055	0.0000
Te-131m	1.2500	d	0.64	2.0742E+08	3.5980E-08	1.4200	0.0523	0.0000	0.0000
Te-121m	154.10	d	4.54	1.6370E+10	2.3034E-08	0.2171	0.0769	0.0000	0.0000
Br-77	2.3760	d	0.01	2.2405E+08	2.0446E-08	0.3360	0.0000	0.0011	0.0000
Te-123m	119.40	d	0.08	7.4653E+09	1.3557E-08	0.1480	0.1020	0.0000	0.0000
Te-131	25.000	m	0.40	6.1351E+05	7.6622E-09	0.4220	0.7210	0.0000	0.0000
I-133	20.800	h	0.48	1.3500E+07	3.3776E-09	0.6080	0.4100	0.0000	0.0000
I-132	2.2950	h	0.57	2.6803E+05	6.0775E-10	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	8.7127E+06	5.8962E-10	0.2340	0.1020	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Xe-135	9.1390	h	0.22	1.0256E+05	5.8396E-11	0.2490	0.3190	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.4520E+12	2.3790E-13	0.0248	0.0556	0.0000	0.0000
I-130	12.360	h	0.08	418.2	1.7607E-13	2.1400	0.2960	0.0000	0.0000
Br-76	16.200	h	1.24	113.0	3.6286E-14	2.7800	0.0000	0.6515	0.0000
I-123	13.220	h	0.03	43.65	1.7181E-14	0.1723	0.0276	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Kr-85m	4.4810	h	0.18	3.5348E-04	4.1050E-19	0.1570	0.2282	0.0000	0.0000
I-135	6.5690	h	0.30	4.0027E-06	3.1709E-21	1.6500	0.3770	0.0000	0.0000
Xe-135m	15.290	m	0.33	2.6671E-08	5.4464E-22	0.4320	0.0984	0.0000	0.0000
Br-80	17.600	m	0.28	2.6053E-09	4.6219E-23	0.0800	0.7182	0.0081	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 115
Total activity (Ci) = 434.44

Total number of decays = 2.43858E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15361
Average chain length = 1.0000

Average gamma E (MeV) = 1.51118E-04
Average beta E (MeV) = 2.00404E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.21672148E-04 R/hr per Ci/m2
Composite ECF per FGR table = 2.08503523E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.88898086E-03 Rem/hr per Ci/m2

Air Source

Point in time = 14.8547211 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	4.1008E+19	253.8	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.4816E+16	0.1858	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	1.0467E+15	1.9023E-02	0.0200	0.1430	0.0000	0.0000
Xe-133	5.2440	d	0.08	2.0754E+14	8.5813E-03	0.0463	0.1360	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2108E+18	7.0857E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4068E+17	6.7730E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.3251E+15	4.8362E-03	0.0424	0.0179	0.0000	0.0000
Xe-129m	8.8800	d	0.23	1.7677E+14	4.3161E-03	0.0513	0.1830	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.1304E+12	5.0841E-04	0.0414	0.1920	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.0474E+12	4.5288E-04	0.2570	0.0053	0.0183	0.0000
Kr-85	10.750	y	0.21	6.4344E+15	3.5532E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	1.8554E+13	1.1052E-04	0.2710	0.0307	0.0000	0.0000
I-131	8.0230	d	0.02	8.1602E+11	2.2053E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	8.6353E+12	1.5642E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6255E+14	3.2122E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4784E+07	3.0323E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	4.0888E+11	2.6386E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	3.7108E+08	1.6647E-06	0.0631	0.5420	0.0000	0.0000
I-124	4.1760	d	0.01	7.2364E+09	3.7573E-07	1.0900	0.0065	0.1880	0.0000
Te-125m	57.400	d	0.26	7.8656E+10	2.9712E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.1692E+11	2.3257E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	4.0931E+08	2.2781E-07	0.0050	0.2245	0.0000	0.0000
Xe-125	16.900	h	1.18	6.9531E+08	2.1410E-07	0.2690	0.0323	0.0013	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	1.0854E+10	1.2283E-07	0.5770	0.0091	0.0000	0.0000
Br-82	1.4720	d	0.08	5.0129E+08	7.3840E-08	2.6600	0.1439	0.0000	0.0000
I-126	12.970	d	0.39	3.6615E+09	6.1211E-08	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.6154E+10	2.2729E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.3381E+09	1.3326E-08	0.1480	0.1020	0.0000	0.0000
Br-77	2.3760	d	0.01	9.4462E+07	8.6203E-09	0.3360	0.0000	0.0011	0.0000
Te-131m	1.2500	d	0.64	4.0170E+07	6.9678E-09	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	1.1881E+05	1.4839E-09	0.4220	0.7210	0.0000	0.0000
I-132	2.2950	h	0.57	1.4127E+05	3.2031E-10	2.2900	0.4940	0.0000	0.0000
I-133	20.800	h	0.48	1.2649E+06	3.1645E-10	0.6080	0.4100	0.0000	0.0000
Te-132	3.2040	d	0.41	4.5920E+06	3.1075E-10	0.2340	0.1020	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Xe-135	9.1390	h	0.22	468.3	2.6668E-13	0.2490	0.3190	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.4777E+12	2.3885E-13	0.0248	0.0556	0.0000	0.0000
Rh-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
I-130	12.360	h	0.08	7.779	3.2749E-15	2.1400	0.2960	0.0000	0.0000
Br-76	16.200	h	1.24	5.403	1.7355E-15	2.7800	0.0000	0.6515	0.0000
I-123	13.220	h	0.03	1.052	4.1414E-16	0.1723	0.0276	0.0000	0.0000
Kr-85m	4.4810	h	0.18	5.9586E-09	6.9197E-24	0.1570	0.2282	0.0000	0.0000
I-135	6.5690	h	0.30	2.2199E-09	1.7586E-24	1.6500	0.3770	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.4792E-11	3.0205E-25	0.4320	0.0984	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 115
Total activity (Ci) = 419.11

Total number of decays = 2.44262E+11
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15387
Average chain length = 1.0000

Average gamma E (MeV) = 1.46557E-04
Average beta E (MeV) = 2.06990E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.78098417E-04 R/hr per Ci/m2
Composite ECF per FGR table = 1.84589357E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.83196657E-03 Rem/hr per Ci/m2

Air Source

Point in time = 18.5520649 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.8115E+19	235.9	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.2651E+16	0.1804	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	8.4432E+14	1.5345E-02	0.0200	0.1430	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2107E+18	7.0855E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4060E+17	6.7692E-03	0.0000	0.0057	0.0000	0.0000
Xe-133	5.2440	d	0.08	1.2998E+14	5.3743E-03	0.0463	0.1360	0.0000	0.0000
I-125	59.410	d	0.02	1.2692E+15	4.6320E-03	0.0424	0.0179	0.0000	0.0000
Xe-129m	8.8800	d	0.23	1.3245E+14	3.2341E-03	0.0513	0.1830	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4302E+15	3.5509E-04	0.0022	0.2507	0.0000	0.0000
Xe-133m	2.1880	d	0.50	1.5902E+12	1.5759E-04	0.0414	0.1920	0.0000	0.0000
Xe-127	36.400	d	0.27	1.7293E+13	1.0301E-04	0.2710	0.0307	0.0000	0.0000
Kr-79	1.4590	d	0.29	5.2610E+11	7.8185E-05	0.2570	0.0053	0.0183	0.0000
I-131	8.0230	d	0.02	5.9292E+11	1.6024E-05	0.3823	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	8.4524E+12	1.5311E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6251E+14	3.2114E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4778E+07	3.0316E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	3.7885E+11	2.4448E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	3.4383E+08	1.5424E-06	0.0631	0.5420	0.0000	0.0000
Te-125m	57.400	d	0.26	7.5221E+10	2.8414E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.1420E+11	2.2717E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.9980E+08	2.2251E-07	0.0050	0.2245	0.0000	0.0000
I-124	4.1760	d	0.01	3.9174E+09	2.0340E-07	1.0900	0.0065	0.1880	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	9.7162E+09	1.0995E-07	0.5770	0.0091	0.0000	0.0000
I-126	12.970	d	0.39	3.0050E+09	5.0236E-08	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.5887E+10	2.2354E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	7.1823E+09	1.3043E-08	0.1480	0.1020	0.0000	0.0000
Br-82	1.4720	d	0.08	8.7896E+07	1.2947E-08	2.6600	0.1439	0.0000	0.0000
Xe-125	16.900	h	1.18	1.8263E+07	5.6235E-09	0.2690	0.0323	0.0013	0.0000
Br-77	2.3760	d	0.01	3.2123E+07	2.9314E-09	0.3360	0.0000	0.0011	0.0000
Te-131m	1.2500	d	0.64	5.1700E+06	8.9679E-10	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	1.5292E+04	1.9098E-10	0.4220	0.7210	0.0000	0.0000
I-132	2.2950	h	0.57	6.3483E+04	1.4394E-10	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	2.0636E+06	1.3965E-10	0.2340	0.1020	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
I-133	20.800	h	0.48	6.5735E+04	1.6446E-11	0.6080	0.4100	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.5078E+12	2.3995E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Xe-135	9.1390	h	0.22	0.5593	3.1850E-16	0.2490	0.3190	0.0000	0.0000
Br-76	16.200	h	1.24	0.1213	3.8952E-17	2.7800	0.0000	0.6515	0.0000
I-130	12.360	h	0.08	5.3667E-02	2.2595E-17	2.1400	0.2960	0.0000	0.0000
I-123	13.220	h	0.03	1.0034E-02	3.9496E-18	0.1723	0.0276	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	8.9377E+09	5.7677E-26	0.0000	0.0026	0.0000	0.0000
I-135	6.5690	h	0.30	1.9051E-13	1.5092E-28	1.6500	0.3770	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.2694E-15	2.5922E-29	0.4320	0.0984	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 112
Total activity (Ci) = 401.19

Total number of decays = 2.44746E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15417
Average chain length = 1.0000

Average gamma E (MeV) = 1.41836E-04
Average beta E (MeV) = 2.15337E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.44190853E-04 R/hr per Ci/m2
Composite ECF per FGR table = 1.73799024E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.77295157E-03 Rem/hr per Ci/m2

Air Source

Point in time = 23.1697197 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.4787E+19	215.3	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	7.0036E+16	0.1739	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	6.4564E+14	1.1734E-02	0.0200	0.1430	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2106E+18	7.0853E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4050E+17	6.7644E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.2026E+15	4.3891E-03	0.0424	0.0179	0.0000	0.0000
Xe-133	5.2440	d	0.08	7.1450E+13	2.9543E-03	0.0463	0.1360	0.0000	0.0000
Xe-129m	8.8800	d	0.23	9.2368E+13	2.2554E-03	0.0513	0.1830	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4249E+15	3.5480E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	1.5837E+13	9.4338E-05	0.2710	0.0307	0.0000	0.0000
Xe-133m	2.1880	d	0.50	3.6826E+11	3.6494E-05	0.0414	0.1920	0.0000	0.0000
Se-75	119.70	d	0.20	8.2294E+12	1.4907E-05	0.3889	0.0000	0.0000	0.0000
I-131	8.0230	d	0.02	3.9787E+11	1.0753E-05	0.3823	0.1920	0.0000	0.0000
Kr-79	1.4590	d	0.29	5.8657E+10	8.7172E-06	0.2570	0.0053	0.0183	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6246E+14	3.2105E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4771E+07	3.0307E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	3.4443E+11	2.2227E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	3.1259E+08	1.4023E-06	0.0631	0.5420	0.0000	0.0000
Te-125m	57.400	d	0.26	7.1142E+10	2.6873E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.1090E+11	2.2060E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.8823E+08	2.1607E-07	0.0050	0.2245	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	8.4881E+09	9.6057E-08	0.5770	0.0091	0.0000	0.0000
I-124	4.1760	d	0.01	1.8203E+09	9.4511E-08	1.0900	0.0065	0.1880	0.0000
I-126	12.970	d	0.39	2.3478E+09	3.9250E-08	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.5561E+10	2.1895E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	6.9923E+09	1.2698E-08	0.1480	0.1020	0.0000	0.0000
Br-82	1.4720	d	0.08	9.9917E+06	1.4718E-09	2.6600	0.1439	0.0000	0.0000
Br-77	2.3760	d	0.01	8.3518E+06	7.6215E-10	0.3360	0.0000	0.0011	0.0000
Te-131m	1.2500	d	0.64	3.9944E+05	6.9286E-11	1.4200	0.0523	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Xe-125	16.900	h	1.18	1.9388E+05	5.9699E-11	0.2690	0.0323	0.0013	0.0000
I-132	2.2950	h	0.57	2.3378E+04	5.3008E-11	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	7.5992E+05	5.1426E-11	0.2340	0.1020	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Te-131	25.000	m	0.40	1181.	1.4755E-11	0.4220	0.7210	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-133	20.800	h	0.48	1636.	4.0940E-13	0.6080	0.4100	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.5423E+12	2.4122E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Br-76	16.200	h	1.24	1.0578E-03	3.3978E-19	2.7800	0.0000	0.6515	0.0000
Xe-135	9.1390	h	0.22	1.2510E-04	7.1232E-20	0.2490	0.3190	0.0000	0.0000
I-130	12.360	h	0.08	1.0729E-04	4.5173E-20	2.1400	0.2960	0.0000	0.0000
I-123	13.220	h	0.03	3.0055E-05	1.1831E-20	0.1723	0.0276	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	9.1277E+09	5.8903E-26	0.0000	0.0026	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 111
Total activity (Ci) = 380.57

Total number of decays = 2.45323E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15454
Average chain length = 1.0000

Average gamma E (MeV) = 1.36353E-04
Average beta E (MeV) = 2.25921E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.14517235E-04 R/hr per Ci/m2
Composite ECF per FGR table = 1.69464329E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.70441554E-03 Rem/hr per Ci/m2

Air Source

Point in time = 28.9367237 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	3.1035E+19	192.1	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	6.6902E+16	0.1661	0.0000	0.0486	0.0000	0.0000
Xe-131m	11.930	d	0.13	4.6182E+14	8.3935E-03	0.0200	0.1430	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2105E+18	7.0850E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4037E+17	6.7584E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	1.1244E+15	4.1035E-03	0.0424	0.0179	0.0000	0.0000
Xe-129m	8.8800	d	0.23	5.8887E+13	1.4379E-03	0.0513	0.1830	0.0000	0.0000
Xe-133	5.2440	d	0.08	3.3532E+13	1.3865E-03	0.0463	0.1360	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4184E+15	3.5444E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	1.4190E+13	8.4527E-05	0.2710	0.0307	0.0000	0.0000
Se-75	119.70	d	0.20	7.9591E+12	1.4417E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
I-131	8.0230	d	0.02	2.4175E+11	6.5333E-06	0.3823	0.1920	0.0000	0.0000
Xe-133m	2.1880	d	0.50	5.9254E+10	5.8719E-06	0.0414	0.1920	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6240E+14	3.2093E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4762E+07	3.0296E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	3.0580E+11	1.9733E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	2.7753E+08	1.2450E-06	0.0631	0.5420	0.0000	0.0000
Kr-79	1.4590	d	0.29	3.7882E+09	5.6298E-07	0.2570	0.0053	0.0183	0.0000
Te-125m	57.400	d	0.26	6.6356E+10	2.5066E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.0690E+11	2.1265E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.7425E+08	2.0829E-07	0.0050	0.2245	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	7.2086E+09	8.1577E-08	0.5770	0.0091	0.0000	0.0000
I-124	4.1760	d	0.01	6.9890E+08	3.6288E-08	1.0900	0.0065	0.1880	0.0000
I-126	12.970	d	0.39	1.7251E+09	2.8840E-08	0.4330	0.1400	0.0055	0.0000
Te-121m	154.10	d	4.54	1.5162E+10	2.1334E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	6.7621E+09	1.2280E-08	0.1480	0.1020	0.0000	0.0000
Br-77	2.3760	d	0.01	1.5528E+06	1.4171E-10	0.3360	0.0000	0.0011	0.0000
Br-82	1.4720	d	0.08	6.6110E+05	9.7379E-11	2.6600	0.1439	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
I-132	2.2950	h	0.57	6714.	1.5223E-11	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	2.1824E+05	1.4769E-11	0.2340	0.1020	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.6316E+04	2.8302E-12	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	48.26	6.0271E-13	0.4220	0.7210	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.5809E+12	2.4265E-13	0.0248	0.0556	0.0000	0.0000
Xe-125	16.900	h	1.18	664.0	2.0445E-13	0.2690	0.0323	0.0013	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
I-133	20.800	h	0.48	16.25	4.0647E-15	0.6080	0.4100	0.0000	0.0000
Br-76	16.200	h	1.24	2.8345E-06	9.1050E-22	2.7800	0.0000	0.6515	0.0000
I-130	12.360	h	0.08	4.5669E-08	1.9228E-23	2.1400	0.2960	0.0000	0.0000
I-123	13.220	h	0.03	2.1196E-08	8.3434E-24	0.1723	0.0276	0.0000	0.0000
Xe-135	9.1390	h	0.22	3.4532E-09	1.9663E-24	0.2490	0.3190	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	9.3579E+09	6.0389E-26	0.0000	0.0026	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 108
Total activity (Ci) = 357.34

Total number of decays = 2.46003E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15496
Average chain length = 1.0000

Average gamma E (MeV) = 1.29709E-04
Average beta E (MeV) = 2.39321E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 8.78431892E-05 R/hr per Ci/m2
Composite ECF per FGR table = 1.69594161E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.62136822E-03 Rem/hr per Ci/m2

Air Source

Point in time = 36.1390800 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Ar-37	35.030	d	0.09	2.6913E+19	166.6	0.0002	0.0019	0.0000	0.0000
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	6.3184E+16	0.1569	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2103E+18	7.0846E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.4022E+17	6.7509E-03	0.0000	0.0057	0.0000	0.0000
Xe-131m	11.930	d	0.13	3.0391E+14	5.5234E-03	0.0200	0.1430	0.0000	0.0000
I-125	59.410	d	0.02	1.0337E+15	3.7728E-03	0.0424	0.0179	0.0000	0.0000
Xe-129m	8.8800	d	0.23	3.3563E+13	8.1952E-04	0.0513	0.1830	0.0000	0.0000
Xe-133	5.2440	d	0.08	1.2971E+13	5.3632E-04	0.0463	0.1360	0.0000	0.0000
Kr-85	10.750	y	0.21	6.4102E+15	3.5398E-04	0.0022	0.2507	0.0000	0.0000
Xe-127	36.400	d	0.27	1.2371E+13	7.3694E-05	0.2710	0.0307	0.0000	0.0000
Se-75	119.70	d	0.20	7.6340E+12	1.3828E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
I-131	8.0230	d	0.02	1.2975E+11	3.5067E-06	0.3823	0.1920	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6233E+14	3.2079E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4751E+07	3.0282E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	2.6358E+11	1.7009E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	2.3921E+08	1.0731E-06	0.0631	0.5420	0.0000	0.0000
Xe-133m	2.1880	d	0.50	6.0506E+09	5.9960E-07	0.0414	0.1920	0.0000	0.0000
Te-125m	57.400	d	0.26	6.0828E+10	2.2978E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	1.0212E+11	2.0313E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.5750E+08	1.9897E-07	0.0050	0.2245	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	5.9323E+09	6.7133E-08	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	1.4679E+10	2.0654E-08	0.2171	0.0769	0.0000	0.0000
I-126	12.970	d	0.39	1.1740E+09	1.9626E-08	0.4330	0.1400	0.0055	0.0000
Kr-79	1.4590	d	0.29	1.2371E+08	1.8385E-08	0.2570	0.0053	0.0183	0.0000
Te-123m	119.40	d	0.08	6.4852E+09	1.1777E-08	0.1480	0.1020	0.0000	0.0000
I-124	4.1760	d	0.01	2.1146E+08	1.0979E-08	1.0900	0.0065	0.1880	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Br-77	2.3760	d	0.01	1.8994E+05	1.7333E-11	0.3360	0.0000	0.0011	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Br-82	1.4720	d	0.08	2.2251E+04	3.2776E-12	2.6600	0.1439	0.0000	0.0000
I-132	2.2950	h	0.57	1413.	3.2049E-12	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	4.5945E+04	3.1093E-12	0.2340	0.1020	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.6232E+12	2.4421E-13	0.0248	0.0556	0.0000	0.0000
Te-131m	1.2500	d	0.64	300.7	5.2157E-14	1.4200	0.0523	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Te-131	25.000	m	0.40	0.8894	1.1107E-14	0.4220	0.7210	0.0000	0.0000
Xe-125	16.900	h	1.18	0.5535	1.7045E-16	0.2690	0.0323	0.0013	0.0000
I-133	20.800	h	0.48	5.1178E-02	1.2804E-17	0.6080	0.4100	0.0000	0.0000
Br-76	16.200	h	1.24	1.7396E-09	5.5878E-25	2.7800	0.0000	0.6515	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	9.6348E+09	6.2176E-26	0.0000	0.0026	0.0000	0.0000
I-130	12.360	h	0.08	2.8163E-12	1.1857E-27	2.1400	0.2960	0.0000	0.0000
I-123	13.220	h	0.03	2.4557E-12	9.6663E-28	0.1723	0.0276	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Xe-135	9.1390	h	0.22	6.9902E-15	3.9803E-30	0.2490	0.3190	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 107
Total activity (Ci) = 331.81

Total number of decays = 2.46796E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15546
Average chain length = 1.0000

Average gamma E (MeV) = 1.21559E-04
Average beta E (MeV) = 2.56218E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 6.46222252E-05 R/hr per Ci/m2
Composite ECF per FGR table = 1.74038578E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.51948433E-03 Rem/hr per Ci/m2

Air Source

Point in time = 45.1341934 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	2.2525E+19	139.4	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	5.8829E+16	0.1461	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2101E+18	7.0842E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.4002E+17	6.7415E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	9.3074E+14	3.3969E-03	0.0424	0.0179	0.0000
Xe-131m	11.930	d	0.13	1.8020E+14	3.2752E-03	0.0200	0.1430	0.0000
Xe-129m	8.8800	d	0.23	1.6632E+13	4.0610E-04	0.0513	0.1830	0.0000
Kr-85	10.750	y	0.21	6.4001E+15	3.5342E-04	0.0022	0.2507	0.0000
Xe-133	5.2440	d	0.08	3.9527E+12	1.6343E-04	0.0463	0.1360	0.0000
Xe-127	36.400	d	0.27	1.0424E+13	6.2093E-05	0.2710	0.0307	0.0000
Se-75	119.70	d	0.20	7.2465E+12	1.3126E-05	0.3889	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Cs-137	30.041	y	0.10	1.6224E+14	3.2060E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4737E+07	3.0265E-06	0.5990	0.0652	0.0000
I-131	8.0230	d	0.02	5.9651E+10	1.6121E-06	0.3823	0.1920	0.0000
Te-129m	33.600	d	0.30	2.1894E+11	1.4128E-06	0.0373	0.2660	0.0000
Te-129	1.1600	h	0.29	1.9870E+08	8.9136E-07	0.0631	0.5420	0.0000
Te-125m	57.400	d	0.26	5.4567E+10	2.0613E-07	0.0360	0.1110	0.0000
Te-127m	109.00	d	1.84	9.6439E+10	1.9184E-07	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	3.3762E+08	1.8791E-07	0.0050	0.2245	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-121	19.160	d	0.26	4.7247E+09	5.3467E-08	0.5770	0.0091	0.0000
Xe-133m	2.1880	d	0.50	3.5013E+08	3.4697E-08	0.0414	0.1920	0.0000
Te-121m	154.10	d	4.54	1.4097E+10	1.9835E-08	0.2171	0.0769	0.0000
I-126	12.970	d	0.39	7.2590E+08	1.2135E-08	0.4330	0.1400	0.0055
Te-123m	119.40	d	0.08	6.1552E+09	1.1178E-08	0.1480	0.1020	0.0000
I-124	4.1760	d	0.01	4.7512E+07	2.4669E-09	1.0900	0.0065	0.1880
Kr-79	1.4590	d	0.29	1.7238E+06	2.5617E-10	0.2570	0.0053	0.0183
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
Br-77	2.3760	d	0.01	1.3771E+04	1.2567E-12	0.3360	0.0000	0.0011
I-132	2.2950	h	0.57	201.9	4.5781E-13	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	6563.	4.4415E-13	0.2340	0.1020	0.0000
I-129	0.16100E+08	y	4.35	6.6679E+12	2.4586E-13	0.0248	0.0556	0.0000
Br-82	1.4720	d	0.08	322.0	4.7426E-14	2.6600	0.1439	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
Te-131m	1.2500	d	0.64	2.051	3.5569E-16	1.4200	0.0523	0.0000
Te-131	25.000	m	0.40	6.0651E-03	7.5748E-17	0.4220	0.7210	0.0000
Xe-125	16.900	h	1.18	7.9024E-05	2.4333E-20	0.2690	0.0323	0.0013
I-133	20.800	h	0.48	3.8433E-05	9.6152E-21	0.6080	0.4100	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	9.9648E+09	6.4305E-26	0.0000	0.0026	0.0000
Br-76	16.200	h	1.24	1.6939E-13	5.4411E-29	2.7800	0.0000	0.6515
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
I-123	13.220	h	0.03	2.9809E-17	1.1734E-32	0.1723	0.0276	0.0000
I-130	12.360	h	0.08	1.5553E-17	6.5481E-33	2.1400	0.2960	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 107
Total activity (Ci) = 304.63

Total number of decays = 2.47709E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15604
Average chain length = 1.0000

Average gamma E (MeV) = 1.11556E-04
Average beta E (MeV) = 2.77321E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 4.55507143E-05 R/hr per Ci/m2
Composite ECF per FGR table = 1.82953663E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.39444415E-03 Rem/hr per Ci/m2

Air Source

Point in time = 56.3682137 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-37	35.030	d	0.09	1.8035E+19	111.6	0.0002	0.0019	0.0000	0.0000
S-35	87.310	d	0.18	5.3810E+16	0.1336	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2099E+18	7.0836E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.3978E+17	6.7299E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	8.1641E+14	2.9796E-03	0.0424	0.0179	0.0000	0.0000
Xe-131m	11.930	d	0.13	9.3821E+13	1.7052E-03	0.0200	0.1430	0.0000	0.0000
Kr-85	10.750	y	0.21	6.3874E+15	3.5272E-04	0.0022	0.2507	0.0000	0.0000
Xe-129m	8.8800	d	0.23	6.9199E+12	1.6897E-04	0.0513	0.1830	0.0000	0.0000
Xe-127	36.400	d	0.27	8.4164E+12	5.0134E-05	0.2710	0.0307	0.0000	0.0000
Xe-133	5.2440	d	0.08	8.9551E+11	3.7027E-05	0.0463	0.1360	0.0000	0.0000
Se-75	119.70	d	0.20	6.7901E+12	1.2300E-05	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6212E+14	3.2038E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4719E+07	3.0243E-06	0.5990	0.0652	0.0000	0.0000
Te-129m	33.600	d	0.30	1.7365E+11	1.1206E-06	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	1.5759E+08	7.0698E-07	0.0631	0.5420	0.0000	0.0000
I-131	8.0230	d	0.02	2.2600E+10	6.1077E-07	0.3823	0.1920	0.0000	0.0000
Te-125m	57.400	d	0.26	4.7645E+10	1.7998E-07	0.0360	0.1110	0.0000	0.0000
Te-127m	109.00	d	1.84	8.9790E+10	1.7861E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.1435E+08	1.7495E-07	0.0050	0.2245	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-121	19.160	d	0.26	3.6522E+09	4.1331E-08	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	1.3402E+10	1.8858E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	5.7666E+09	1.0472E-08	0.1480	0.1020	0.0000	0.0000
I-126	12.970	d	0.39	3.9824E+08	6.6575E-09	0.4330	0.1400	0.0055	0.0000
Xe-133m	2.1880	d	0.50	9.9685E+06	9.8785E-10	0.0414	0.1920	0.0000	0.0000
I-124	4.1760	d	0.01	7.3620E+06	3.8225E-10	1.0900	0.0065	0.1880	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Kr-79	1.4590	d	0.29	8291.	1.2321E-12	0.2570	0.0053	0.0183	0.0000
I-129	0.16100E+08	y	4.35	6.7132E+12	2.4753E-13	0.0248	0.0556	0.0000	0.0000
Br-77	2.3760	d	0.01	519.6	4.7416E-14	0.3360	0.0000	0.0011	0.0000
I-132	2.2950	h	0.57	17.77	4.0290E-14	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	577.6	3.9088E-14	0.2340	0.1020	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Br-82	1.4720	d	0.08	1.623	2.3912E-16	2.6600	0.1439	0.0000	0.0000
Te-131m	1.2500	d	0.64	4.0407E-03	7.0090E-19	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	1.1951E-05	1.4926E-19	0.4220	0.7210	0.0000	0.0000
I-133	20.800	h	0.48	4.8156E-09	1.2048E-24	0.6080	0.4100	0.0000	0.0000
Xe-125	16.900	h	1.18	1.2452E-09	3.8341E-25	0.2690	0.0323	0.0013	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	1.0353E+10	6.6813E-26	0.0000	0.0026	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000	0.0000
Br-76	16.200	h	1.24	1.6552E-18	5.3168E-34	2.7800	0.0000	0.6515	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000	0.0000
I-123	13.220	h	0.03	2.1626E-23	8.5125E-39	0.1723	0.0276	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 104
Total activity (Ci) = 276.83

Total number of decays = 2.48752E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15670
Average chain length = 1.0000

Average gamma E (MeV) = 9.94144E-05
Average beta E (MeV) = 3.03204E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.10267569E-05 R/hr per Ci/m2
Composite ECF per FGR table = 1.96329391E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.24267989E-03 Rem/hr per Ci/m2

Air Source

Point in time = 70.3984070 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	1.3663E+19	84.57	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	4.8138E+16	0.1195	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2095E+18	7.0829E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.3948E+17	6.7154E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	6.9313E+14	2.5297E-03	0.0424	0.0179	0.0000
Xe-131m	11.930	d	0.13	4.1522E+13	7.5465E-04	0.0200	0.1430	0.0000
Kr-85	10.750	y	0.21	6.3716E+15	3.5185E-04	0.0022	0.2507	0.0000
Xe-129m	8.8800	d	0.23	2.3146E+12	5.6517E-05	0.0513	0.1830	0.0000
Xe-127	36.400	d	0.27	6.4431E+12	3.8380E-05	0.2710	0.0307	0.0000
Se-75	119.70	d	0.20	6.2603E+12	1.1340E-05	0.3889	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Xe-133	5.2440	d	0.08	1.4018E+11	5.7960E-06	0.0463	0.1360	0.0000
Cs-137	30.041	y	0.10	1.6198E+14	3.2009E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4697E+07	3.0216E-06	0.5990	0.0652	0.0000
Te-129m	33.600	d	0.30	1.3001E+11	8.3896E-07	0.0373	0.2660	0.0000
Te-129	1.1600	h	0.29	1.1799E+08	5.2930E-07	0.0631	0.5420	0.0000
I-131	8.0230	d	0.02	6.7248E+09	1.8174E-07	0.3823	0.1920	0.0000
Te-127m	109.00	d	1.84	8.2126E+10	1.6337E-07	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	2.8751E+08	1.6002E-07	0.0050	0.2245	0.0000
Te-125m	57.400	d	0.26	4.0219E+10	1.5193E-07	0.0360	0.1110	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-121	19.160	d	0.26	2.7671E+09	3.1314E-08	0.5770	0.0091	0.0000
Te-121m	154.10	d	4.54	1.2583E+10	1.7704E-08	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	5.3155E+09	9.6528E-09	0.1480	0.1020	0.0000
I-126	12.970	d	0.39	1.8815E+08	3.1454E-09	0.4330	0.1400	0.0055
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
I-124	4.1760	d	0.01	7.1716E+05	3.7236E-11	1.0900	0.0065	0.1880
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
Xe-133m	2.1880	d	0.50	1.1704E+05	1.1598E-11	0.0414	0.1920	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
I-129	0.16100E+08	y	4.35	6.7569E+12	2.4914E-13	0.0248	0.0556	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
I-132	2.2950	h	0.57	0.8540	1.9364E-15	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	27.76	1.8786E-15	0.2340	0.1020	0.0000
Kr-79	1.4590	d	0.29	10.56	1.5699E-15	0.2570	0.0053	0.0183
Br-77	2.3760	d	0.01	8.671	7.9132E-16	0.3360	0.0000	0.0011
Br-82	1.4720	d	0.08	2.1937E-03	3.2313E-19	2.6600	0.1439	0.0000
Te-131m	1.2500	d	0.64	1.6891E-06	2.9299E-22	1.4200	0.0523	0.0000
Te-131	25.000	m	0.40	4.9958E-09	6.2393E-23	0.4220	0.7210	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	1.0804E+10	6.9724E-26	0.0000	0.0026	0.0000
I-133	20.800	h	0.48	6.4472E-14	1.6130E-29	0.6080	0.4100	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Xe-125	16.900	h	1.18	1.2513E-15	3.8529E-31	0.2690	0.0323	0.0013
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000
Br-76	16.200	h	1.24	9.1578E-25	2.9417E-40	2.7800	0.0000	0.6515

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 104
Total activity (Ci) = 249.75

Total number of decays = 2.49930E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15744
Average chain length = 1.0000

Average gamma E (MeV) = 8.50744E-05
Average beta E (MeV) = 3.33950E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.09206919E-05 R/hr per Ci/m2
Composite ECF per FGR table = 2.13790961E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.06342928E-03 Rem/hr per Ci/m2

Air Source

Point in time = 87.9205856 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5850E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	9.6600E+18	59.79	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	4.1886E+16	0.1040	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2092E+18	7.0820E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.3910E+17	6.6973E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	5.6498E+14	2.0620E-03	0.0424	0.0179	0.0000
Kr-85	10.750	y	0.21	6.3519E+15	3.5076E-04	0.0022	0.2507	0.0000
Xe-131m	11.930	d	0.13	1.5002E+13	2.7265E-04	0.0200	0.1430	0.0000
Xe-127	36.400	d	0.27	4.6151E+12	2.7491E-05	0.2710	0.0307	0.0000
Xe-129m	8.8800	d	0.23	5.8950E+11	1.4394E-05	0.0513	0.1830	0.0000
Se-75	119.70	d	0.20	5.6562E+12	1.0246E-05	0.3889	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Cs-137	30.041	y	0.10	1.6180E+14	3.1974E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4670E+07	3.0183E-06	0.5990	0.0652	0.0000
Te-129m	33.600	d	0.30	9.0570E+10	5.8446E-07	0.0373	0.2660	0.0000
Xe-133	5.2440	d	0.08	1.3830E+10	5.7184E-07	0.0463	0.1360	0.0000
Te-129	1.1600	h	0.29	8.2197E+07	3.6874E-07	0.0631	0.5420	0.0000
Te-127m	109.00	d	1.84	7.3466E+10	1.4614E-07	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	2.5720E+08	1.4315E-07	0.0050	0.2245	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-125m	57.400	d	0.26	3.2549E+10	1.2295E-07	0.0360	0.1110	0.0000
I-131	8.0230	d	0.02	1.4799E+09	3.9995E-08	0.3823	0.1920	0.0000
Te-121	19.160	d	0.26	2.0919E+09	2.3673E-08	0.5770	0.0091	0.0000
Te-121m	154.10	d	4.54	1.1629E+10	1.6362E-08	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	4.8014E+09	8.7192E-09	0.1480	0.1020	0.0000
I-126	12.970	d	0.39	7.3760E+07	1.2331E-09	0.4330	0.1400	0.0055
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
I-124	4.1760	d	0.01	3.9131E+04	2.0317E-12	1.0900	0.0065	0.1880
I-129	0.16100E+08	y	4.35	6.7963E+12	2.5059E-13	0.0248	0.0556	0.0000
Xe-133m	2.1880	d	0.50	454.6	4.5045E-14	0.0414	0.1920	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
I-132	2.2950	h	0.57	1.9283E-02	4.3723E-17	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	0.6268	4.2418E-17	0.2340	0.1020	0.0000
Br-77	2.3760	d	0.01	5.2251E-02	4.7682E-18	0.3360	0.0000	0.0011
Kr-79	1.4590	d	0.29	2.5616E-03	3.8069E-19	0.2570	0.0053	0.0000
Br-82	1.4720	d	0.08	5.7257E-07	8.4339E-23	2.6600	0.1439	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	1.1319E+10	7.3042E-26	0.0000	0.0026	0.0000
Te-131m	1.2500	d	0.64	1.0183E-10	1.7664E-26	1.4200	0.0523	0.0000
Te-131	25.000	m	0.40	3.0119E-13	3.7617E-27	0.4220	0.7210	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000
I-133	20.800	h	0.48	5.2866E-20	1.3226E-35	0.6080	0.4100	0.0000
Xe-125	16.900	h	1.18	4.0425E-23	1.2448E-38	0.2690	0.0323	0.0013

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 102
Total activity (Ci) = 224.95

Total number of decays = 2.51255E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15827
Average chain length = 1.0000

Average gamma E (MeV) = 6.89593E-05
Average beta E (MeV) = 3.68596E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.44767700E-05 R/hr per Ci/m2
Composite ECF per FGR table = 2.34302031E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 8.61991488E-04 Rem/hr per Ci/m2

Air Source

Point in time = 109.804245 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5849E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-37	35.030	d	0.09	6.2650E+18	38.78	0.0002	0.0019	0.0000	0.0000
S-35	87.310	d	0.18	3.5206E+16	8.7432E-02	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2087E+18	7.0809E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.3864E+17	6.6748E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	4.3767E+14	1.5973E-03	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750	y	0.21	6.3274E+15	3.4941E-04	0.0022	0.2507	0.0000	0.0000
Xe-131m	11.930	d	0.13	4.2068E+12	7.6457E-05	0.0200	0.1430	0.0000	0.0000
Xe-127	36.400	d	0.27	3.0423E+12	1.8122E-05	0.2710	0.0307	0.0000	0.0000
Se-75	119.70	d	0.20	4.9830E+12	9.0263E-06	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6158E+14	3.1930E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4636E+07	3.0141E-06	0.5990	0.0652	0.0000	0.0000
Xe-129m	8.8800	d	0.23	1.0681E+11	2.6081E-06	0.0513	0.1830	0.0000	0.0000
Te-129m	33.600	d	0.30	5.7666E+10	3.7213E-07	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	5.2335E+07	2.3478E-07	0.0631	0.5420	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-127m	109.00	d	1.84	6.3922E+10	1.2716E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	2.2378E+08	1.2455E-07	0.0050	0.2245	0.0000	0.0000
Te-125m	57.400	d	0.26	2.4991E+10	9.4400E-08	0.0360	0.1110	0.0000	0.0000
Xe-133	5.2440	d	0.08	7.6666E+08	3.1699E-08	0.0463	0.1360	0.0000	0.0000
Te-121	19.160	d	0.26	1.6115E+09	1.8237E-08	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	1.0539E+10	1.4829E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	4.2286E+09	7.6790E-09	0.1480	0.1020	0.0000	0.0000
I-131	8.0230	d	0.02	2.2343E+08	6.0382E-09	0.3823	0.1920	0.0000	0.0000
I-126	12.970	d	0.39	2.2904E+07	3.8289E-10	0.4330	0.1400	0.0055	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.8293E+12	2.5181E-13	0.0248	0.0556	0.0000	0.0000
I-124	4.1760	d	0.01	1035.	5.3749E-14	1.0900	0.0065	0.1880	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Xe-133m	2.1880	d	0.50	0.4434	4.3938E-17	0.0414	0.1920	0.0000	0.0000
I-132	2.2950	h	0.57	1.6948E-04	3.8428E-19	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	5.5090E-03	3.7281E-19	0.2340	0.1020	0.0000	0.0000
Br-77	2.3760	d	0.01	8.8210E-05	8.0498E-21	0.3360	0.0000	0.0011	0.0000
Kr-79	1.4590	d	0.29	7.8225E-08	1.1625E-23	0.2570	0.0053	0.0183	0.0000
Te-123	0.91992E+17	y	0.00	1.1891E+10	7.6738E-26	0.0000	0.0026	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	1.9166E-11	2.8231E-27	2.6600	0.1439	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000	0.0000
Te-131m	1.2500	d	0.64	5.4673E-16	9.4836E-32	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	1.6171E-18	2.0196E-32	0.4220	0.7210	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000	0.0000
I-133	20.800	h	0.48	1.3245E-27	3.3071E-43	0.6080	0.4100	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 102
Total activity (Ci) = 203.92

Total number of decays = 2.52750E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.15921
Average chain length = 1.0000

Average gamma E (MeV) = 5.22354E-05
Average beta E (MeV) = 4.04580E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.04743413E-05 R/hr per Ci/m2
Composite ECF per FGR table = 2.55866355E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.52941992E-04 Rem/hr per Ci/m2

Air Source

Point in time = 137.134811 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5849E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-37	35.030	d	0.09	3.6480E+18	22.58	0.0002	0.0019	0.0000	0.0000
S-35	87.310	d	0.18	2.8339E+16	7.0378E-02	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2080E+18	7.0796E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.3806E+17	6.6467E-03	0.0000	0.0057	0.0000	0.0000
I-125	59.410	d	0.02	3.1817E+14	1.1612E-03	0.0424	0.0179	0.0000	0.0000
Kr-85	10.750	y	0.21	6.2969E+15	3.4773E-04	0.0022	0.2507	0.0000	0.0000
Xe-131m	11.930	d	0.13	8.5964E+11	1.5624E-05	0.0200	0.1430	0.0000	0.0000
Xe-127	36.400	d	0.27	1.8079E+12	1.0769E-05	0.2710	0.0307	0.0000	0.0000
Se-75	119.70	d	0.20	4.2536E+12	7.7050E-06	0.3889	0.0000	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6130E+14	3.1875E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4594E+07	3.0089E-06	0.5990	0.0652	0.0000	0.0000
Xe-129m	8.8800	d	0.23	1.2651E+10	3.0891E-07	0.0513	0.1830	0.0000	0.0000
Te-129m	33.600	d	0.30	3.2814E+10	2.1175E-07	0.0373	0.2660	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-129	1.1600	h	0.29	2.9781E+07	1.3360E-07	0.0631	0.5420	0.0000	0.0000
Te-127m	109.00	d	1.84	5.3724E+10	1.0687E-07	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	1.8808E+08	1.0468E-07	0.0050	0.2245	0.0000	0.0000
Te-125m	57.400	d	0.26	1.7966E+10	6.7864E-08	0.0360	0.1110	0.0000	0.0000
Te-121	19.160	d	0.26	1.2795E+09	1.4480E-08	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	9.3197E+09	1.3113E-08	0.2171	0.0769	0.0000	0.0000
Te-123m	119.40	d	0.08	3.6082E+09	6.5524E-09	0.1480	0.1020	0.0000	0.0000
Xe-133	5.2440	d	0.08	2.0687E+07	8.5536E-10	0.0463	0.1360	0.0000	0.0000
I-131	8.0230	d	0.02	2.1070E+07	5.6943E-10	0.3823	0.1920	0.0000	0.0000
I-126	12.970	d	0.39	5.3158E+06	8.8867E-11	0.4330	0.1400	0.0055	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.8542E+12	2.5272E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
I-124	4.1760	d	0.01	11.09	5.7574E-16	1.0900	0.0065	0.1880	0.0000
Xe-133m	2.1880	d	0.50	7.7015E-05	7.6320E-21	0.0414	0.1920	0.0000	0.0000
I-132	2.2950	h	0.57	4.5844E-07	1.0395E-21	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	1.4902E-05	1.0085E-21	0.2340	0.1020	0.0000	0.0000
Br-77	2.3760	d	0.01	3.0398E-08	2.7740E-24	0.3360	0.0000	0.0011	0.0000
Te-123	0.91992E+17	y	0.00	1.2512E+10	8.0742E-26	0.0000	0.0026	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.7961E-13	2.6692E-29	0.2570	0.0053	0.0183	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000	0.0000
Br-82	1.4720	d	0.08	4.9353E-17	7.2697E-33	2.6600	0.1439	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000	0.0000
Te-131m	1.2500	d	0.64	1.4319E-22	2.4838E-38	1.4200	0.0523	0.0000	0.0000
Te-131	25.000	m	0.40	4.2352E-25	5.2895E-39	0.4220	0.7210	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 101
Total activity (Ci) = 187.70

Total number of decays = 2.54455E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16029
Average chain length = 1.0000

Average gamma E (MeV) = 3.67798E-05
Average beta E (MeV) = 4.37822E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.70027600E-06 R/hr per Ci/m2
Composite ECF per FGR table = 2.75657600E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.59747331E-04 Rem/hr per Ci/m2

Air Source

Point in time = 171.267685 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5849E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	1.8567E+18	11.49	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	2.1613E+16	5.3673E-02	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2073E+18	7.0779E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.3733E+17	6.6119E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	2.1366E+14	7.7976E-04	0.0424	0.0179	0.0000
Kr-85	10.750	y	0.21	6.2591E+15	3.4564E-04	0.0022	0.2507	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Se-75	119.70	d	0.20	3.4908E+12	6.3232E-06	0.3889	0.0000	0.0000
Xe-127	36.400	d	0.27	9.4384E+11	5.6222E-06	0.2710	0.0307	0.0000
Cs-137	30.041	y	0.10	1.6095E+14	3.1806E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4541E+07	3.0025E-06	0.5990	0.0652	0.0000
Xe-131m	11.930	d	0.13	1.1832E+11	2.1504E-06	0.0200	0.1430	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-129m	33.600	d	0.30	1.6228E+10	1.0472E-07	0.0373	0.2660	0.0000
Te-127m	109.00	d	1.84	4.3242E+10	8.6018E-08	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	1.5139E+08	8.4255E-08	0.0050	0.2245	0.0000
Te-129	1.1600	h	0.29	1.4728E+07	6.6069E-08	0.0631	0.5420	0.0000
Te-125m	57.400	d	0.26	1.1897E+10	4.4940E-08	0.0360	0.1110	0.0000
Xe-129m	8.8800	d	0.23	8.8112E+08	2.1515E-08	0.0513	0.1830	0.0000
Te-121	19.160	d	0.26	1.0375E+09	1.1741E-08	0.5770	0.0091	0.0000
Te-121m	154.10	d	4.54	7.9933E+09	1.1247E-08	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	2.9596E+09	5.3746E-09	0.1480	0.1020	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
I-131	8.0230	d	0.02	1.1040E+06	2.9837E-11	0.3823	0.1920	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
I-126	12.970	d	0.39	8.5774E+05	1.4339E-11	0.4330	0.1400	0.0055
Xe-133	5.2440	d	0.08	2.2715E+05	9.3921E-12	0.0463	0.1360	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
I-129	0.16100E+08	y	4.35	6.8708E+12	2.5334E-13	0.0248	0.0556	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
I-124	4.1760	d	0.01	3.8404E-02	1.9940E-18	1.0900	0.0065	0.1880
I-132	2.2950	h	0.57	2.8467E-10	6.4548E-25	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	9.2535E-09	6.2622E-25	0.2340	0.1020	0.0000
Xe-133m	2.1880	d	0.50	1.5506E-09	1.5366E-25	0.0414	0.1920	0.0000
Te-123	0.91992E+17	y	0.00	1.3160E+10	8.4927E-26	0.0000	0.0026	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
Br-77	2.3760	d	0.01	1.4399E-12	1.3140E-28	0.3360	0.0000	0.0011
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000
Kr-79	1.4590	d	0.29	1.6286E-20	2.4204E-36	0.2570	0.0053	0.0183
Br-82	1.4720	d	0.08	5.1642E-24	7.6069E-40	2.6600	0.1439	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 99
Total activity (Ci) = 176.59

Total number of decays = 2.56435E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16154
Average chain length = 1.0000

Average gamma E (MeV) = 2.45468E-05
Average beta E (MeV) = 4.64094E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 5.43078841E-06 R/hr per Ci/m2
Composite ECF per FGR table = 2.90964963E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.06834903E-04 Rem/hr per Ci/m2

Air Source

Point in time = 213.896667 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5849E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	7.9873E+17	4.944	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	1.5407E+16	3.8263E-02	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2063E+18	7.0757E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.3643E+17	6.5687E-03	0.0000	0.0057	0.0000
I-125	59.410	d	0.02	1.2993E+14	4.7420E-04	0.0424	0.0179	0.0000
Kr-85	10.750	y	0.21	6.2122E+15	3.4305E-04	0.0022	0.2507	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6385E-06	0.0003	0.2466	0.0000
Se-75	119.70	d	0.20	2.7272E+12	4.9400E-06	0.3889	0.0000	0.0000
Cs-137	30.041	y	0.10	1.6052E+14	3.1720E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4475E+07	2.9944E-06	0.5990	0.0652	0.0000
Xe-127	36.400	d	0.27	4.1914E+11	2.4967E-06	0.2710	0.0307	0.0000
Xe-131m	11.930	d	0.13	9.9399E+09	1.8066E-07	0.0200	0.1430	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-127m	109.00	d	1.84	3.2974E+10	6.5593E-08	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	1.1544E+08	6.4249E-08	0.0050	0.2245	0.0000
Te-129m	33.600	d	0.30	6.7350E+09	4.3462E-08	0.0373	0.2660	0.0000
Te-129	1.1600	h	0.29	6.1124E+06	2.7420E-08	0.0631	0.5420	0.0000
Te-125m	57.400	d	0.26	7.1100E+09	2.6858E-08	0.0360	0.1110	0.0000
Te-121	19.160	d	0.26	8.3763E+08	9.4791E-09	0.5770	0.0091	0.0000
Te-121m	154.10	d	4.54	6.5986E+09	9.2845E-09	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	2.3108E+09	4.1963E-09	0.1480	0.1020	0.0000
Xe-129m	8.8800	d	0.23	3.1617E+07	7.7200E-10	0.0513	0.1830	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
I-126	12.970	d	0.39	8.7892E+04	1.4693E-12	0.4330	0.1400	0.0055
I-131	8.0230	d	0.02	2.7765E+04	7.5036E-13	0.3823	0.1920	0.0000
I-129	0.16100E+08	y	4.35	6.8803E+12	2.5369E-13	0.0248	0.0556	0.0000
Xe-133	5.2440	d	0.08	811.4	3.3547E-14	0.0463	0.1360	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
I-124	4.1760	d	0.01	3.2467E-05	1.6857E-21	1.0900	0.0065	0.1880
Te-123	0.91992E+17	y	0.00	1.3809E+10	8.9114E-26	0.0000	0.0026	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
I-132	2.2950	h	0.57	2.8130E-14	6.3783E-29	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	9.1438E-13	6.1879E-29	0.2340	0.1020	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-133m	2.1880	d	0.50	2.1160E-15	2.0969E-31	0.0414	0.1920	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000
Br-77	2.3760	d	0.01	5.7202E-18	5.2201E-34	0.3360	0.0000	0.0011
Kr-79	1.4590	d	0.29	2.6082E-29	4.2039E-45	0.2570	0.0053	0.0183
He-3	0.0000	s	0.00	4.5663E+15	0.000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 97
Total activity (Ci) = 170.03

Total number of decays = 2.58791E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16302
Average chain length = 1.0000

Average gamma E (MeV) = 1.65511E-05
Average beta E (MeV) = 4.81223E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.51121503E-06 R/hr per Ci/m2
Composite ECF per FGR table = 3.00547603E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.06888435E-04 Rem/hr per Ci/m2

Air Source

Point in time = 267.136078 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5849E+24	165.0	0.0000	0.0495	0.0000
Ar-37	35.030	d	0.09	2.7854E+17	1.724	0.0002	0.0019	0.0000
S-35	87.310	d	0.18	1.0096E+16	2.5074E-02	0.0000	0.0486	0.0000
Ar-39	269.01	y	3.35	3.2051E+18	7.0731E-03	0.0002	0.2188	0.0000
H-3	12.330	y	0.16	1.3532E+17	6.5151E-03	0.0000	0.0057	0.0000
Kr-85	10.750	y	0.21	6.1541E+15	3.3984E-04	0.0022	0.2507	0.0000
I-125	59.410	d	0.02	6.9815E+13	2.5480E-04	0.0424	0.0179	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6384E-06	0.0003	0.2466	0.0000
Se-75	119.70	d	0.20	2.0037E+12	3.6294E-06	0.3889	0.0000	0.0000
Cs-137	30.041	y	0.10	1.5998E+14	3.1614E-06	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.4392E+07	2.9843E-06	0.5990	0.0652	0.0000
Xe-127	36.400	d	0.27	1.5208E+11	9.0588E-07	0.2710	0.0307	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000
Te-127m	109.00	d	1.84	2.3504E+10	4.6755E-08	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	8.2285E+07	4.5796E-08	0.0050	0.2245	0.0000
Te-129m	33.600	d	0.30	2.2457E+09	1.4492E-08	0.0373	0.2660	0.0000
Te-125m	57.400	d	0.26	3.7382E+09	1.4121E-08	0.0360	0.1110	0.0000
Te-129	1.1600	h	0.29	2.0381E+06	9.1430E-09	0.0631	0.5420	0.0000
Xe-131m	11.930	d	0.13	4.5081E+08	8.1934E-09	0.0200	0.1430	0.0000
Te-121	19.160	d	0.26	6.5503E+08	7.4127E-09	0.5770	0.0091	0.0000
Te-121m	154.10	d	4.54	5.1934E+09	7.3073E-09	0.2171	0.0769	0.0000
Te-123m	119.40	d	0.08	1.6964E+09	3.0806E-09	0.1480	0.1020	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000
Xe-129m	8.8800	d	0.23	4.9558E+05	1.2101E-11	0.0513	0.1830	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000
I-129	0.16100E+08	y	4.35	6.8848E+12	2.5385E-13	0.0248	0.0556	0.0000
I-126	12.970	d	0.39	5108.	8.5398E-14	0.4330	0.1400	0.0055
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000
I-131	8.0230	d	0.02	279.2	7.5454E-15	0.3823	0.1920	0.0000
Xe-133	5.2440	d	0.08	0.7129	2.9476E-17	0.0463	0.1360	0.0000
I-124	4.1760	d	0.01	4.7167E-09	2.4490E-25	1.0900	0.0065	0.1880
Te-123	0.91992E+17	y	0.00	1.4424E+10	9.3079E-26	0.0000	0.0026	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000
I-132	2.2950	h	0.57	2.7995E-19	6.3478E-34	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	9.1001E-18	6.1584E-34	0.2340	0.1020	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000
Xe-133m	2.1880	d	0.50	1.0016E-22	9.9259E-39	0.0414	0.1920	0.0000
Br-77	2.3760	d	0.01	1.0285E-24	9.3853E-41	0.3360	0.0000	0.0011
He-3	0.0000	s	0.00	5.6797E+15	0.000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	2.5431E+13	0.000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 96
Total activity (Ci) = 166.79

Total number of decays = 2.61652E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16482
Average chain length = 1.0000

Average gamma E (MeV) = 1.23697E-05
Average beta E (MeV) = 4.90140E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.04560092E-06 R/hr per Ci/m2
Composite ECF per FGR table = 3.05171066E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.54620851E-04 Rem/hr per Ci/m2

Air Source

Point in time = 333.626343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5848E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-37	35.030	d	0.09	7.4732E+16	0.4626	0.0002	0.0019	0.0000	0.0000
S-35	87.310	d	0.18	5.9556E+15	1.4790E-02	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2036E+18	7.0698E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.3394E+17	6.4487E-03	0.0000	0.0057	0.0000	0.0000
Kr-85	10.750	y	0.21	6.0823E+15	3.3587E-04	0.0022	0.2507	0.0000	0.0000
I-125	59.410	d	0.02	3.2140E+13	1.1730E-04	0.0424	0.0179	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6384E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.5931E+14	3.1481E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4290E+07	2.9718E-06	0.5990	0.0652	0.0000	0.0000
Se-75	119.70	d	0.20	1.3634E+12	2.4696E-06	0.3889	0.0000	0.0000	0.0000
Xe-127	36.400	d	0.27	4.2873E+10	2.5538E-07	0.2710	0.0307	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Te-127m	109.00	d	1.84	1.5400E+10	3.0633E-08	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	5.3913E+07	3.0006E-08	0.0050	0.2245	0.0000	0.0000
Te-125m	57.400	d	0.26	1.6748E+09	6.3264E-09	0.0360	0.1110	0.0000	0.0000
Te-121	19.160	d	0.26	4.8509E+08	5.4895E-09	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	3.8509E+09	5.4184E-09	0.2171	0.0769	0.0000	0.0000
Te-129m	33.600	d	0.30	5.6971E+08	3.6764E-09	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	5.1704E+05	2.3195E-09	0.0631	0.5420	0.0000	0.0000
Te-123m	119.40	d	0.08	1.1532E+09	2.0941E-09	0.1480	0.1020	0.0000	0.0000
Xe-131m	11.930	d	0.13	9.4676E+06	1.7207E-10	0.0200	0.1430	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.8864E+12	2.5391E-13	0.0248	0.0556	0.0000	0.0000
Xe-129m	8.8800	d	0.23	2761.	6.7423E-14	0.0513	0.1830	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
I-126	12.970	d	0.39	146.2	2.4447E-15	0.4330	0.1400	0.0055	0.0000
I-131	8.0230	d	0.02	0.8936	2.4150E-17	0.3823	0.1920	0.0000	0.0000
Xe-133	5.2440	d	0.08	1.0869E-04	4.4939E-21	0.0463	0.1360	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	1.4967E+10	9.6585E-26	0.0000	0.0026	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
I-124	4.1760	d	0.01	7.5970E-14	3.9445E-30	1.0900	0.0065	0.1880	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000	0.0000
I-132	2.2950	h	0.57	1.5850E-25	3.5939E-40	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	5.1522E-24	3.4867E-40	0.2340	0.1020	0.0000	0.0000
He-3	0.0000	s	0.00	7.0575E+15	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	2.5431E+13	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228205D+24

Total number of nuclides = 97
Total activity (Ci) = 165.52

Total number of decays = 2.65181E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16705
Average chain length = 1.0000

Average gamma E (MeV) = 1.06720E-05
Average beta E (MeV) = 4.93729E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 1.08906113E-06 R/hr per Ci/m2
Composite ECF per FGR table = 3.06748261E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.33400448E-04 Rem/hr per Ci/m2

Air Source

Point in time = 1.14079583 yrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
C-14	5701.1	y	0.53	1.5848E+24	165.0	0.0000	0.0495	0.0000	0.0000
Ar-37	35.030	d	0.09	1.4451E+16	8.9448E-02	0.0002	0.0019	0.0000	0.0000
S-35	87.310	d	0.18	3.0804E+15	7.6500E-03	0.0000	0.0486	0.0000	0.0000
Ar-39	269.01	y	3.35	3.2017E+18	7.0656E-03	0.0002	0.2188	0.0000	0.0000
H-3	12.330	y	0.16	1.3224E+17	6.3668E-03	0.0000	0.0057	0.0000	0.0000
Kr-85	10.750	y	0.21	5.9938E+15	3.3099E-04	0.0022	0.2507	0.0000	0.0000
I-125	59.410	d	0.02	1.2198E+13	4.4517E-05	0.0424	0.0179	0.0000	0.0000
Cl-36	0.30101E+06	y	1.00	3.3660E+18	6.6384E-06	0.0003	0.2466	0.0000	0.0000
Cs-137	30.041	y	0.10	1.5847E+14	3.1317E-06	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.4163E+07	2.9563E-06	0.5990	0.0652	0.0000	0.0000
Se-75	119.70	d	0.20	8.4289E+11	1.5268E-06	0.3889	0.0000	0.0000	0.0000
Kr-81	0.21000E+06	y	4.76	4.7839E+16	1.3523E-07	0.0165	0.0048	0.0000	0.0000
Xe-127	36.400	d	0.27	8.8193E+09	5.2534E-08	0.2710	0.0307	0.0000	0.0000
Te-127m	109.00	d	1.84	9.0819E+09	1.8066E-08	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.1795E+07	1.7696E-08	0.0050	0.2245	0.0000	0.0000
Te-121	19.160	d	0.26	3.3383E+08	3.7778E-09	0.5770	0.0091	0.0000	0.0000
Te-121m	154.10	d	4.54	2.6506E+09	3.7295E-09	0.2171	0.0769	0.0000	0.0000
Te-125m	57.400	d	0.26	6.1441E+08	2.3209E-09	0.0360	0.1110	0.0000	0.0000
Te-123m	119.40	d	0.08	7.1210E+08	1.2931E-09	0.1480	0.1020	0.0000	0.0000
Te-129m	33.600	d	0.30	1.0272E+08	6.6289E-10	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	9.3228E+04	4.1822E-10	0.0631	0.5420	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	2.5640E+14	6.6177E-11	0.0000	0.0560	0.0000	0.0000
Se-79	0.11000E+07	y	18.18	3.4110E+13	1.8408E-11	0.0000	0.0558	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.0410E+13	7.5726E-12	0.0001	0.2030	0.0000	0.0000
Xe-131m	11.930	d	0.13	7.6012E+04	1.3815E-12	0.0200	0.1430	0.0000	0.0000
I-129	0.16100E+08	y	4.35	6.8869E+12	2.5393E-13	0.0248	0.0556	0.0000	0.0000
Rb-87	0.47501E+11	y	0.84	1.0210E+15	1.2760E-14	0.0000	0.0817	0.0000	0.0000
Xe-129m	8.8800	d	0.23	4.227	1.0322E-16	0.0513	0.1830	0.0000	0.0000
I-126	12.970	d	0.39	1.729	2.8899E-17	0.4330	0.1400	0.0055	0.0000
I-131	8.0230	d	0.02	6.8452E-04	1.8500E-20	0.3823	0.1920	0.0000	0.0000
Te-123	0.91992E+17	y	0.00	1.5408E+10	9.9431E-26	0.0000	0.0026	0.0000	0.0000
Xe-133	5.2440	d	0.08	1.8589E-09	7.6862E-26	0.0463	0.1360	0.0000	0.0000
Xe-134	0.11000E+17	y	0.00	1.3886E+09	7.4937E-26	0.0000	0.0000	0.0000	0.0000
Se-82	0.12100E+21	y	14.05	1.7920E+09	8.7917E-30	0.0000	0.0000	0.0000	0.0000
Te-128	0.22000E+25	y	13.64	1.1464E+12	3.0933E-31	0.0000	0.0000	0.0000	0.0000
Xe-136	0.21000E+21	y	0.00	3.5900E+07	1.0148E-31	0.0000	0.0000	0.0000	0.0000
Te-130	0.79002E+24	y	12.66	6.9610E+08	5.2308E-34	0.0000	0.0000	0.0000	0.0000
I-124	4.1760	d	0.01	7.8453E-20	4.0734E-36	1.0900	0.0065	0.1880	0.0000
He-3	0.0000	s	0.00	8.7585E+15	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	2.5431E+13	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.587482606228206D+24
Current number of atoms = 1.587482606228206D+24

Total number of nuclides = 95
Total activity (Ci) = 165.13

Total number of decays = 2.69569E+21
Asympt number of decays = 1.58748E+24
Percent of decays = 0.16981
Average chain length = 1.0000

Average gamma E (MeV) = 1.01551E-05
Average beta E (MeV) = 4.94802E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 5.65169898E-07 R/hr per Ci/m2
Composite ECF per FGR table = 3.07032751E-04 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.26939180E-04 Rem/hr per Ci/m2

Appendix C. Bomb Component Activation Source

This appendix contains a list of the fifty most-active radionuclides vs. time produced from the Hiroshima detonation. The points in time where chosen to be equally spaced in the logarithmic plane from 1×10^{-6} hours to 1×10^4 hours.

The activities that are presented are integrals over all space. The gamma and beta energies per decay listed in the table represent integrals over the emission spectrum for each radionuclide.

Bomb Component Source

Point in time = 0.00000000 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	4.0010E+22	1.4277E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0070E+21	1.4997E+09	0.0274	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	2.0480E+19	1.3557E+09	0.0017	0.0122	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
B-12	0.20200E-01	s	0.10	5.2510E+16	4.8698E+07	0.0950	6.3550	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5590E+20	4.0210E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9810E+20	2.4853E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.1110E+19	2.1182E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3900E+20	1.9358E+07	1.7790	1.2470	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.4140E+18	6.6224E+06	1.0026	0.1430	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.5110E+19	5.5095E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8760E+19	3.6157E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4400E+19	1.9205E+06	0.0066	0.0536	0.0000	0.0000
Co-64	0.30000	s	10.00	1.5120E+16	9.4418E+05	0.1800	3.3300	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000	0.0000
Mn-58	2.7000	s	22.22	7.6380E+16	5.2996E+05	0.0569	2.8120	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
B-13	0.17330E-01	s	0.98	2.1400E+14	2.3133E+05	0.3257	6.3490	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000	0.0000
Al-30	3.6500	s	1.64	3.0540E+16	1.5675E+05	3.4820	2.2990	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8950E+18	1.4556E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4100E+18	1.2974E+05	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	4.4070E+16	1.1579E+05	4.6030	2.6930	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1850E+18	1.0400E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5790E+17	9.5313E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5800E+17	5.9436E+04	4.1000	1.4680	0.0000	0.0000
Hf-177m	1.0800	s	5.56	3.2720E+15	5.6756E+04	1.0640	0.2404	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.0070E+21	2.3117E+04	0.0001	0.1269	0.0000	0.0000
P-34	12.400	s	0.81	1.5090E+16	2.2798E+04	0.3344	2.3020	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.6380E+16	2.1939E+04	2.3780	1.7530	0.0000	0.0000
C-15	2.4490	s	0.20	1.6160E+15	1.2362E+04	3.3580	2.9960	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0180E+17	1.0536E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5790E+17	1.0278E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3450E+16	8889.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4820E+17	8194.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3450E+16	2695.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000	0.0000
N-17	4.1700	s	0.10	2.7380E+14	1230.	0.0420	1.7200	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0320E+16	991.3	0.0552	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 94
Total activity (Ci) = 1.46063E+11

Total number of decays = 0.0000
Asympt number of decays = 1.75603E+24
Percent of decays = 0.0000
Average chain length = 1.5377

Average gamma E (MeV) = 0.12803
Average beta E (MeV) = 4.20145E-03
Average alpha E (MeV) = 1.58551E-11

Composite Exposure Rate Conversion Factor = 1.78968215 R/hr per Ci/m2
Composite ECF per FGR table = 9.37706009E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60037577 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 9.99999978E-03 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9957E+22	1.4258E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0064E+21	1.4996E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.9984E+19	1.3229E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5589E+20	4.0209E+07	0.0033	1.1010	0.0000
B-12	0.20200E-01	s	0.10	3.7258E+16	3.4553E+07	0.0950	6.3550	0.0000
V-52	3.7450	m	0.13	2.9809E+20	2.4852E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1102E+19	2.1174E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3899E+20	1.9357E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.4116E+18	6.6109E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5108E+19	5.5091E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8759E+19	3.6154E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4399E+19	1.9205E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.4775E+16	9.2261E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Be-8	0.70000E-16	s	28.57	2.008	5.3745E+05	0.0000	0.0000	0.0460
Mn-58	2.7000	s	22.22	7.6184E+16	5.2860E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0482E+16	1.5645E+05	3.4820	2.2990	0.0000
B-13	0.17330E-01	s	0.98	1.4345E+14	1.5507E+05	0.3257	6.3490	0.0000
Ta-186	10.500	m	2.86	4.8949E+18	1.4556E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4100E+18	1.2973E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.4027E+16	1.1568E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1850E+18	1.0400E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5786E+17	9.5306E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5798E+17	5.9428E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.2511E+15	5.6393E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0076E+21	2.3119E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5082E+16	2.2785E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6372E+16	2.1937E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.6114E+15	1.2327E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	2.0180E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5790E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3447E+16	8888.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4820E+17	8194.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3452E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7335E+14	1228.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.45828E+11

Total number of decays = 5.39996E+19
Asympt number of decays = 1.75603E+24
Percent of decays = 3.07509E-03
Average chain length = 1.5377

Average gamma E (MeV) = 0.12806
Average beta E (MeV) = 3.58516E-03
Average alpha E (MeV) = 1.69550E-07

Composite Exposure Rate Conversion Factor = 1.79016089 R/hr per Ci/m2
Composite ECF per FGR table = 9.28854793E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60077024 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.55975576E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9928E+22	1.4247E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0061E+21	1.4995E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.9712E+19	1.3049E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5588E+20	4.0208E+07	0.0033	1.1010	0.0000
B-12	0.20200E-01	s	0.10	3.0747E+16	2.8515E+07	0.0950	6.3550	0.0000
V-52	3.7450	m	0.13	2.9809E+20	2.4852E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1098E+19	2.1170E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3899E+20	1.9356E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.4102E+18	6.6045E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5107E+19	5.5088E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8758E+19	3.6153E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4399E+19	1.9205E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.4585E+16	9.1076E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	7.6075E+16	5.2784E+05	0.0569	2.8120	0.0000
Be-8	0.70000E-16	s	28.57	1.657	4.4353E+05	0.0000	0.0000	0.0460
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0450E+16	1.5628E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8949E+18	1.4556E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4099E+18	1.2973E+05	0.3692	0.8684	0.0000
B-13	0.17330E-01	s	0.98	1.1468E+14	1.2397E+05	0.3257	6.3490	0.0000
N-16	7.1300	s	0.28	4.4003E+16	1.1562E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1849E+18	1.0399E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5785E+17	9.5302E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5797E+17	5.9423E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.2394E+15	5.6191E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0079E+21	2.3120E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5077E+16	2.2778E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6367E+16	2.1936E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.6089E+15	1.2307E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0179E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5789E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3445E+16	8888.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4820E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3454E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7309E+14	1227.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.45698E+11

Total number of decays = 8.41885E+19
 Asympt number of decays = 1.75603E+24
 Percent of decays = 4.79424E-03
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12808
 Average beta E (MeV) = 3.32180E-03
 Average alpha E (MeV) = 1.40047E-07

Composite Exposure Rate Conversion Factor = 1.79042542 R/hr per Ci/m2
 Composite ECF per FGR table = 9.23984945E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.60098696 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.94798186E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9907E+22	1.4240E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0059E+21	1.4995E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.9526E+19	1.2925E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5587E+20	4.0208E+07	0.0033	1.1010	0.0000
B-12	0.20200E-01	s	0.10	2.6912E+16	2.4958E+07	0.0950	6.3550	0.0000
V-52	3.7450	m	0.13	2.9808E+20	2.4852E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1095E+19	2.1167E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3899E+20	1.9356E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.4092E+18	6.6000E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5106E+19	5.5087E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8757E+19	3.6152E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4399E+19	1.9204E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.4455E+16	9.0263E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	7.5999E+16	5.2731E+05	0.0569	2.8120	0.0000
Be-8	0.70000E-16	s	28.57	1.451	3.8821E+05	0.0000	0.0000	0.0460
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0427E+16	1.5617E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8949E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4099E+18	1.2973E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3987E+16	1.1557E+05	4.6030	2.6930	0.0000
B-13	0.17330E-01	s	0.98	9.8184E+13	1.0614E+05	0.3257	6.3490	0.0000
Al-29	6.5600	m	0.91	2.1849E+18	1.0399E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5783E+17	9.5299E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5796E+17	5.9420E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.2313E+15	5.6051E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0081E+21	2.3121E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5074E+16	2.2773E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6364E+16	2.1935E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.6071E+15	1.2294E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0179E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5789E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3444E+16	8888.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4819E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3454E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7291E+14	1226.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.45609E+11

Total number of decays = 1.05111E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 5.98569E-03
Average chain length = 1.5377

Average gamma E (MeV) = 0.12809
Average beta E (MeV) = 3.16658E-03
Average alpha E (MeV) = 1.22657E-07

Composite Exposure Rate Conversion Factor = 1.79060555 R/hr per Ci/m2
Composite ECF per FGR table = 9.20642391E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60113418 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.43283808E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9882E+22	1.4231E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0057E+21	1.4995E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.9295E+19	1.2773E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5586E+20	4.0207E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9808E+20	2.4851E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1091E+19	2.1163E+07	0.2370	0.0000	0.0000
B-12	0.20200E-01	s	0.10	2.2787E+16	2.1133E+07	0.0950	6.3550	0.0000
Al-28	2.2420	m	0.13	1.3898E+20	1.9355E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.4081E+18	6.5945E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5105E+19	5.5084E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8757E+19	3.6151E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4398E+19	1.9204E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.4294E+16	8.9257E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	7.5904E+16	5.2666E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Be-8	0.70000E-16	s	28.57	1.228	3.2871E+05	0.0000	0.0000	0.0460
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0399E+16	1.5602E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8949E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4099E+18	1.2973E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3966E+16	1.1552E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1849E+18	1.0399E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5781E+17	9.5295E+04	1.5990	1.6430	0.0000
B-13	0.17330E-01	s	0.98	8.0876E+13	8.7427E+04	0.3257	6.3490	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5795E+17	5.9416E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.2213E+15	5.5877E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0083E+21	2.3121E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5069E+16	2.2767E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6360E+16	2.1934E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.6049E+15	1.2277E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	2.0179E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5789E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3442E+16	8888.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4819E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3456E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7270E+14	1225.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.45499E+11

Total number of decays = 1.31222E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 7.47267E-03
Average chain length = 1.5377

Average gamma E (MeV) = 0.12811
Average beta E (MeV) = 2.99953E-03
Average alpha E (MeV) = 1.03938E-07

Composite Exposure Rate Conversion Factor = 1.79082727 R/hr per Ci/m2
Composite ECF per FGR table = 9.16508660E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60131490 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.03837620E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9850E+22	1.4220E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0053E+21	1.4994E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.9011E+19	1.2585E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5585E+20	4.0206E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9807E+20	2.4851E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1086E+19	2.1158E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3898E+20	1.9355E+07	1.7790	1.2470	0.0000
B-12	0.20200E-01	s	0.10	1.8512E+16	1.7168E+07	0.0950	6.3550	0.0000
Hf-178m	4.0000	s	7.50	1.4066E+18	6.5876E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5104E+19	5.5082E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8756E+19	3.6149E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4398E+19	1.9204E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.4095E+16	8.8017E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	7.5787E+16	5.2584E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Be-8	0.70000E-16	s	28.57	0.9978	2.6704E+05	0.0000	0.0000	0.0460
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0364E+16	1.5585E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8948E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4099E+18	1.2973E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3940E+16	1.1545E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1849E+18	1.0399E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5779E+17	9.5291E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
B-13	0.17330E-01	s	0.98	6.3480E+13	6.8621E+04	0.3257	6.3490	0.0000
V-54	49.800	s	1.00	1.5793E+17	5.9411E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.2088E+15	5.5660E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0087E+21	2.3122E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5064E+16	2.2759E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6355E+16	2.1932E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.6022E+15	1.2256E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	2.0179E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5789E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3440E+16	8888.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4819E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3457E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7242E+14	1224.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.45362E+11

Total number of decays = 1.63806E+20
 Asympt number of decays = 1.75603E+24
 Percent of decays = 9.32819E-03
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12812
 Average beta E (MeV) = 2.82628E-03
 Average alpha E (MeV) = 8.45199E-08

Composite Exposure Rate Conversion Factor = 1.79109895 R/hr per Ci/m2
 Composite ECF per FGR table = 9.11409557E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.60153544 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.79463360E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9810E+22	1.4206E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0049E+21	1.4993E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.8662E+19	1.2354E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5584E+20	4.0205E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9807E+20	2.4850E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1080E+19	2.1152E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3897E+20	1.9354E+07	1.7790	1.2470	0.0000
B-12	0.20200E-01	s	0.10	1.4281E+16	1.3244E+07	0.0950	6.3550	0.0000
Hf-178m	4.0000	s	7.50	1.4047E+18	6.5790E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5102E+19	5.5078E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8755E+19	3.6147E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4397E+19	1.9204E+06	0.0066	0.0536	0.0000
Co-64	0.30000	s	10.00	1.3851E+16	8.6492E+05	0.1800	3.3300	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	7.5640E+16	5.2482E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Be-8	0.70000E-16	s	28.57	0.7697	2.0600E+05	0.0000	0.0000	0.0460
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0321E+16	1.5562E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8948E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4098E+18	1.2973E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3908E+16	1.1537E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1849E+18	1.0399E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5777E+17	9.5285E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5792E+17	5.9405E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.1933E+15	5.5391E+04	1.0640	0.2404	0.0000
B-13	0.17330E-01	s	0.98	4.6910E+13	5.0710E+04	0.3257	6.3490	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0091E+21	2.3124E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5058E+16	2.2749E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6349E+16	2.1930E+04	2.3780	1.7530	0.0000
C-15	2.4490	s	0.20	1.5987E+15	1.2230E+04	3.3580	2.9960	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0179E+17	1.0536E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5789E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3438E+16	8887.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4819E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3459E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7208E+14	1222.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.45193E+11

Total number of decays = 2.04457E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 1.16431E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12814
Average beta E (MeV) = 2.65469E-03
Average alpha E (MeV) = 6.52811E-08

Composite Exposure Rate Conversion Factor = 1.79143119 R/hr per Ci/m2
Composite ECF per FGR table = 9.05140564E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60180426 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 4.73912507E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9760E+22	1.4188E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0044E+21	1.4992E+09	0.0274	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.8236E+19	1.2071E+09	0.0017	0.0122	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5583E+20	4.0204E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9806E+20	2.4850E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.1073E+19	2.1145E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3897E+20	1.9353E+07	1.7790	1.2470	0.0000	0.0000
B-12	0.20200E-01	s	0.10	1.0327E+16	9.5778E+06	0.0950	6.3550	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.4024E+18	6.5682E+06	1.0026	0.1430	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.5100E+19	5.5074E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8754E+19	3.6145E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4397E+19	1.9204E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5863E+05	0.5583	0.6276	0.0000	0.0000
Co-64	0.30000	s	10.00	1.3552E+16	8.4625E+05	0.1800	3.3300	0.0000	0.0000
Mn-58	2.7000	s	22.22	7.5456E+16	5.2355E+05	0.0569	2.8120	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000	0.0000
Al-30	3.6500	s	1.64	3.0266E+16	1.5534E+05	3.4820	2.2990	0.0000	0.0000
Be-8	0.70000E-16	s	28.57	0.5567	1.4898E+05	0.0000	0.0000	0.0000	0.0460
Ta-186	10.500	m	2.86	4.8947E+18	1.4555E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4098E+18	1.2972E+05	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	4.3867E+16	1.1526E+05	4.6030	2.6930	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1848E+18	1.0399E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5773E+17	9.5278E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0666E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5790E+17	5.9397E+04	4.1000	1.4680	0.0000	0.0000
Hf-177m	1.0800	s	5.56	3.1740E+15	5.5056E+04	1.0640	0.2404	0.0000	0.0000
B-13	0.17330E-01	s	0.98	3.2152E+13	3.4756E+04	0.3257	6.3490	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.0096E+21	2.3125E+04	0.0001	0.1269	0.0000	0.0000
P-34	12.400	s	0.81	1.5050E+16	2.2737E+04	0.3344	2.3020	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.6342E+16	2.1928E+04	2.3780	1.7530	0.0000	0.0000
C-15	2.4490	s	0.20	1.5945E+15	1.2197E+04	3.3580	2.9960	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0178E+17	1.0535E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5788E+17	1.0278E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3434E+16	8887.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4819E+17	8193.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3461E+16	2695.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000	0.0000
N-17	4.1700	s	0.10	2.7165E+14	1220.	0.0420	1.7200	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.44984E+11

Total number of decays = 2.55159E+20
 Asympt number of decays = 1.75603E+24
 Percent of decays = 1.45305E-02
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12817
 Average beta E (MeV) = 2.49425E-03
 Average alpha E (MeV) = 4.72826E-08

Composite Exposure Rate Conversion Factor = 1.79183650 R/hr per Ci/m2
 Composite ECF per FGR table = 8.97466168E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.60213089 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 5.91870211E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9699E+22	1.4166E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0037E+21	1.4991E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.7716E+19	1.1728E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1450E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5581E+20	4.0203E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9805E+20	2.4849E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1064E+19	2.1136E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3896E+20	1.9352E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3996E+18	6.5548E+06	1.0026	0.1430	0.0000
B-12	0.20200E-01	s	0.10	6.8898E+15	6.3897E+06	0.0950	6.3550	0.0000
Mn-57	1.4230	m	2.11	2.5098E+19	5.5069E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8752E+19	3.6142E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4396E+19	1.9204E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	1.3187E+16	8.2350E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.5228E+16	5.2196E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0199E+16	1.5500E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8947E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4097E+18	1.2972E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3817E+16	1.1513E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1848E+18	1.0399E+05	1.3790	0.9765	0.0000
Be-8	0.70000E-16	s	28.57	0.3714	9.9387E+04	0.0000	0.0000	0.0460
Co-62	1.5000	m	2.67	4.5769E+17	9.5270E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0665E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5787E+17	5.9387E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.1500E+15	5.4641E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0103E+21	2.3127E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5040E+16	2.2722E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6332E+16	2.1925E+04	2.3780	1.7530	0.0000
B-13	0.17330E-01	s	0.98	2.0059E+13	2.1684E+04	0.3257	6.3490	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5892E+15	1.2156E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0178E+17	1.0535E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5788E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3431E+16	8886.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4818E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3464E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7112E+14	1218.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.44725E+11

Total number of decays = 3.18380E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 1.81307E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12820
Average beta E (MeV) = 2.35462E-03
Average alpha E (MeV) = 3.16055E-08

Composite Exposure Rate Conversion Factor = 1.79232943 R/hr per Ci/m2
Composite ECF per FGR table = 8.88121426E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60252643 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 7.39187896E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9621E+22	1.4138E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0029E+21	1.4989E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.7088E+19	1.1312E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1449E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5579E+20	4.0201E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9803E+20	2.4848E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1052E+19	2.1124E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3895E+20	1.9350E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3960E+18	6.5381E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5095E+19	5.5062E+06	0.0976	1.0900	0.0000
B-12	0.20200E-01	s	0.10	4.1559E+15	3.8543E+06	0.0950	6.3550	0.0000
V-53	1.6200	m	2.47	1.8750E+19	3.6138E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4395E+19	1.9203E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	1.2746E+16	7.9594E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.4944E+16	5.1999E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1990E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0114E+16	1.5456E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8946E+18	1.4555E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4096E+18	1.2972E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3754E+16	1.1496E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1847E+18	1.0398E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5764E+17	9.5259E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0665E+04	0.7528	0.4179	0.0000
Be-8	0.70000E-16	s	28.57	0.2240	5.9950E+04	0.0000	0.0000	0.0460
V-54	49.800	s	1.00	1.5784E+17	5.9375E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.1204E+15	5.4126E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0111E+21	2.3129E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5028E+16	2.2704E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6320E+16	2.1922E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5825E+15	1.2106E+04	3.3580	2.9960	0.0000
B-13	0.17330E-01	s	0.98	1.1128E+13	1.2029E+04	0.3257	6.3490	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0177E+17	1.0535E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5787E+17	1.0278E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3426E+16	8886.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4818E+17	8193.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3467E+16	2695.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.7046E+14	1215.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.44405E+11

Total number of decays = 3.97179E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 2.26180E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12824
Average beta E (MeV) = 2.24357E-03
Average alpha E (MeV) = 1.91129E-08

Composite Exposure Rate Conversion Factor = 1.79292583 R/hr per Ci/m2
Composite ECF per FGR table = 8.76818970E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60300267 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 9.23173055E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9525E+22	1.4104E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	8.0019E+21	1.4987E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.6335E+19	1.0814E+09	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1449E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5576E+20	4.0198E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9802E+20	2.4846E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.1038E+19	2.1110E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3893E+20	1.9348E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3916E+18	6.5173E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5091E+19	5.5054E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8748E+19	3.6133E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
B-12	0.20200E-01	s	0.10	2.2105E+15	2.0500E+06	0.0950	6.3550	0.0000
Co-60m	10.470	m	0.38	6.4393E+19	1.9203E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	1.2216E+16	7.6282E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.4591E+16	5.1754E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1989E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	3.0009E+16	1.5402E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8945E+18	1.4554E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4096E+18	1.2971E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3676E+16	1.1476E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1846E+18	1.0398E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5757E+17	9.5245E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0665E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5780E+17	5.9360E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	3.0838E+15	5.3491E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2800E+04	0.0970	0.4590	0.0000
Be-8	0.70000E-16	s	28.57	0.1191	3.1887E+04	0.0000	0.0000	0.0460
W-185	75.100	d	0.40	8.0121E+21	2.3132E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.5012E+16	2.2680E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6305E+16	2.1918E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5743E+15	1.2043E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0176E+17	1.0535E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5786E+17	1.0277E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3420E+16	8885.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4817E+17	8193.	0.8914	0.7010	0.0000
B-13	0.17330E-01	s	0.98	5.3311E+12	5763.	0.3257	6.3490	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3471E+16	2696.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7450E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.6963E+14	1211.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.44010E+11

Total number of decays = 4.95347E+20
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.82083E-02
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12829
 Average beta E (MeV) = 2.16470E-03
 Average alpha E (MeV) = 1.02012E-08

Composite Exposure Rate Conversion Factor = 1.79364467 R/hr per Ci/m2
 Composite ECF per FGR table = 8.63264799E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.60357368 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.115295239 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
W-183m	5.2500 s	1.33	3.9406E+22	1.4061E+11	0.1276	0.0000	0.0000
W-185m	1.6670 m	2.00	8.0006E+21	1.4985E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300 s	1.06	1.5441E+19	1.0222E+09	0.0017	0.0122	0.0000
Mn-56	2.5820 h	0.19	9.1449E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850 h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400 m	0.85	4.5573E+20	4.0195E+07	0.0033	1.1010	0.0000
V-52	3.7450 m	0.13	2.9799E+20	2.4844E+07	1.4450	1.0680	0.0000
Hf-179m	18.670 s	0.21	2.1020E+19	2.1092E+07	0.2370	0.0000	0.0000
Al-28	2.2420 m	0.13	1.3892E+20	1.9346E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000 s	7.50	1.3860E+18	6.4914E+06	1.0026	0.1430	0.0000
Mn-57	1.4230 m	2.11	2.5087E+19	5.5044E+06	0.0976	1.0900	0.0000
V-53	1.6200 m	2.47	1.8745E+19	3.6127E+06	1.0380	1.0090	0.0000
Co-58m	8.9000 h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470 m	0.38	6.4392E+19	1.9202E+06	0.0066	0.0536	0.0000
B-12	0.20200E-01 s	0.10	1.0047E+15	9.3182E+05	0.0950	6.3550	0.0000
Ni-65	2.5200 h	0.04	4.1580E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000 s	10.00	1.1584E+16	7.2337E+05	0.1800	3.3300	0.0000
Mn-58	2.7000 s	22.22	7.4152E+16	5.1450E+05	0.0569	2.8120	0.0000
Cr-51	27.710 d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200 h	0.38	8.1989E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500 s	1.64	2.9879E+16	1.5335E+05	3.4820	2.2990	0.0000
Ta-186	10.500 m	2.86	4.8944E+18	1.4554E+05	1.5700	1.0570	0.0000
Ti-51	5.8000 m	0.52	2.4094E+18	1.2971E+05	0.3692	0.8684	0.0000
N-16	7.1300 s	0.28	4.3579E+16	1.1450E+05	4.6030	2.6930	0.0000
Al-29	6.5600 m	0.91	2.1846E+18	1.0398E+05	1.3790	0.9765	0.0000
Co-62	1.5000 m	2.67	4.5749E+17	9.5228E+04	1.5990	1.6430	0.0000
Hf-183	1.0670 h	1.59	1.6540E+19	8.0665E+04	0.7528	0.4179	0.0000
V-54	49.800 s	1.00	1.5775E+17	5.9341E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800 s	5.56	3.0386E+15	5.2708E+04	1.0640	0.2404	0.0000
Co-61	1.6500 h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100 d	0.40	8.0134E+21	2.3136E+04	0.0001	0.1269	0.0000
P-34	12.400 s	0.81	1.4993E+16	2.2651E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870 m	0.77	7.6286E+16	2.1912E+04	2.3780	1.7530	0.0000
Be-8	0.70000E-16 s	28.57	5.4157E-02	1.4494E+04	0.0000	0.0000	0.0460
Hf-180m	5.5000 h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490 s	0.20	1.5641E+15	1.1965E+04	3.3580	2.9960	0.0000
Co-58	70.860 d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300
Fe-61	5.9800 m	1.00	2.0176E+17	1.0534E+04	1.3970	1.1990	0.0000
Co-62m	13.910 m	0.36	4.5786E+17	1.0277E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800 m	1.16	7.3412E+16	8884.	3.0540	0.0000	0.0000
Mg-27	9.4580 m	0.13	2.4817E+17	8192.	0.8914	0.7010	0.0000
Fe-55	2.7351 y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490 d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000 h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100 m	0.82	7.3476E+16	2696.	1.2070	0.0000	1.1050
B-13	0.17330E-01 s	0.98	2.1266E+12	2299.	0.3257	6.3490	0.0000
Mn-54	312.20 d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900 d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250 h	2.44	2.7449E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700 s	0.10	2.6860E+14	1207.	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.43523E+11

Total number of decays = 6.17575E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 3.51688E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12834
Average beta E (MeV) = 2.11627E-03
Average alpha E (MeV) = 4.66129E-09

Composite Exposure Rate Conversion Factor = 1.79450583 R/hr per Ci/m2
Composite ECF per FGR table = 8.47182423E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60425377 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.143992454 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9257E+22	1.4008E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9990E+21	1.4982E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.4393E+19	9.5280E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1449E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5569E+20	4.0192E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9797E+20	2.4842E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0997E+19	2.1069E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3890E+20	1.9343E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3792E+18	6.4592E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5081E+19	5.5031E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8741E+19	3.6120E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4390E+19	1.9202E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1580E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	1.0841E+16	6.7697E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.3608E+16	5.1072E+05	0.0569	2.8120	0.0000
B-12	0.20200E-01	s	0.10	3.7532E+14	3.4807E+05	0.0950	6.3550	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1989E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	2.9716E+16	1.5252E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8942E+18	1.4553E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4093E+18	1.2970E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3457E+16	1.1418E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1844E+18	1.0397E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5739E+17	9.5207E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6540E+19	8.0664E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5768E+17	5.9317E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.9832E+15	5.1746E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0150E+21	2.3141E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4969E+16	2.2615E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6263E+16	2.1906E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5515E+15	1.1868E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0174E+17	1.0533E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5785E+17	1.0277E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3403E+16	8883.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4816E+17	8192.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Be-8	0.70000E-16	s	28.57	2.0230E-02	5414.	0.0000	0.0000	0.0460
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3483E+16	2696.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8610E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7449E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.6732E+14	1201.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0315E+16	991.1	0.0552	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.42920E+11

Total number of decays = 7.69646E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 4.38287E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12840
Average beta E (MeV) = 2.09194E-03
Average alpha E (MeV) = 1.75852E-09

Composite Exposure Rate Conversion Factor = 1.79553008 R/hr per Ci/m2
Composite ECF per FGR table = 8.28354731E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60505700 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.179832458 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.9071E+22	1.3942E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9970E+21	1.4978E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.3184E+19	8.7273E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1449E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5563E+20	4.0187E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9793E+20	2.4839E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0970E+19	2.1041E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3887E+20	1.9340E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3706E+18	6.4192E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5073E+19	5.5015E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8736E+19	3.6110E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4387E+19	1.9201E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1579E+20	8.5862E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	9.9793E+15	6.2317E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.2934E+16	5.0605E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1989E+19	1.6285E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	2.9515E+16	1.5148E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8940E+18	1.4553E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4091E+18	1.2969E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3306E+16	1.1378E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1843E+18	1.0396E+05	1.3790	0.9765	0.0000
B-12	0.20200E-01	s	0.10	1.0972E+14	1.0176E+05	0.0950	6.3550	0.0000
Co-62	1.5000	m	2.67	4.5727E+17	9.5181E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6539E+19	8.0664E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5761E+17	5.9288E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.9153E+15	5.0569E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0170E+21	2.3146E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4939E+16	2.2570E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6234E+16	2.1897E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5358E+15	1.1748E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0173E+17	1.0533E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5783E+17	1.0277E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3391E+16	8882.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4815E+17	8192.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3491E+16	2696.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8611E+19	1645.	0.2936	0.1877	0.0000
Be-8	0.70000E-16	s	28.57	5.9141E-03	1583.	0.0000	0.0000	0.0460
Hf-182m	1.0250	h	2.44	2.7449E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.6574E+14	1194.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0313E+16	991.0	0.0552	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.42178E+11

Total number of decays = 9.58677E+20
Asympt number of decays = 1.75603E+24
Percent of decays = 5.45934E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12848
Average beta E (MeV) = 2.08342E-03
Average alpha E (MeV) = 5.28088E-10

Composite Exposure Rate Conversion Factor = 1.79673600 R/hr per Ci/m2
Composite ECF per FGR table = 8.06682259E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60599470 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.224593058 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.8841E+22	1.3860E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9945E+21	1.4974E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.1815E+19	7.8211E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1448E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5557E+20	4.0181E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9789E+20	2.4836E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0935E+19	2.1006E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3884E+20	1.9335E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3600E+18	6.3696E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5064E+19	5.4995E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8730E+19	3.6099E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4384E+19	1.9200E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1579E+20	8.5861E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	8.9989E+15	5.6194E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.2101E+16	5.0026E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1989E+19	1.6284E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	2.9265E+16	1.5020E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8938E+18	1.4552E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4089E+18	1.2968E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.3118E+16	1.1329E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1841E+18	1.0396E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5711E+17	9.5148E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6539E+19	8.0663E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5751E+17	5.9251E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.8328E+15	4.9137E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0195E+21	2.3153E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4902E+16	2.2513E+04	0.3344	2.3020	0.0000
B-12	0.20200E-01	s	0.10	2.3618E+13	2.1904E+04	0.0950	6.3550	0.0000
Mn-58m	1.0870	m	0.77	7.6198E+16	2.1887E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.5165E+15	1.1600E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0171E+17	1.0532E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5781E+17	1.0276E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3376E+16	8880.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4813E+17	8191.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3501E+16	2697.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8611E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7449E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.6377E+14	1185.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0312E+16	990.9	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3659E+17	870.4	0.1450	0.6334	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.41265E+11

Total number of decays = 1.19339E+21
Asympt number of decays = 1.75603E+24
Percent of decays = 6.79593E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12857
Average beta E (MeV) = 2.08367E-03
Average alpha E (MeV) = 1.26981E-10

Composite Exposure Rate Conversion Factor = 1.79813838 R/hr per Ci/m2
Composite ECF per FGR table = 7.82265887E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60707331 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.280494660 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.8555E+22	1.3758E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9915E+21	1.4968E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.0303E+19	6.8203E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1448E+22	1.8431E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5548E+20	4.0174E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9784E+20	2.4832E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0891E+19	2.0963E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3880E+20	1.9330E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3469E+18	6.3082E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5053E+19	5.4970E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8723E+19	3.6085E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4380E+19	1.9199E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1579E+20	8.5861E+05	0.5583	0.6276	0.0000
Co-64	0.30000	s	10.00	7.9085E+15	4.9385E+05	0.1800	3.3300	0.0000
Mn-58	2.7000	s	22.22	7.1073E+16	4.9314E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1988E+19	1.6284E+05	0.0018	0.5952	0.0000
Al-30	3.6500	s	1.64	2.8956E+16	1.4862E+05	3.4820	2.2990	0.0000
Ta-186	10.500	m	2.86	4.8935E+18	1.4551E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4087E+18	1.2966E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.2885E+16	1.1268E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1839E+18	1.0395E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5691E+17	9.5107E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6539E+19	8.0662E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5738E+17	5.9205E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.7329E+15	4.7406E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0225E+21	2.3162E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4855E+16	2.2443E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6153E+16	2.1874E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
C-15	2.4490	s	0.20	1.4927E+15	1.1418E+04	3.3580	2.9960	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	2.0169E+17	1.0531E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5779E+17	1.0276E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3358E+16	8878.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4811E+17	8191.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
B-12	0.20200E-01	s	0.10	3.4688E+12	3217.	0.0950	6.3550	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3514E+16	2697.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8611E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7449E+17	1394.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.6133E+14	1174.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0310E+16	990.8	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3659E+17	870.4	0.1450	0.6334	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.40145E+11

Total number of decays = 1.48441E+21
Asympt number of decays = 1.75603E+24
Percent of decays = 8.45322E-02
Average chain length = 1.5377

Average gamma E (MeV) = 0.12866
Average beta E (MeV) = 2.08872E-03
Average alpha E (MeV) = 3.25039E-11

Composite Exposure Rate Conversion Factor = 1.79974484 R/hr per Ci/m2
Composite ECF per FGR table = 7.55506158E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.60829115 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.350310326 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.8202E+22	1.3632E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9876E+21	1.4961E+09	0.0274	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	8.6836E+18	5.7483E+08	0.0017	0.0122	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1448E+22	1.8431E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5538E+20	4.0164E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9778E+20	2.4826E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.0837E+19	2.0908E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3875E+20	1.9323E+07	1.7790	1.2470	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.3307E+18	6.2323E+06	1.0026	0.1430	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.5039E+19	5.4939E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8713E+19	3.6067E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4375E+19	1.9197E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1579E+20	8.5861E+05	0.5583	0.6276	0.0000	0.0000
Mn-58	2.7000	s	22.22	6.9811E+16	4.8438E+05	0.0569	2.8120	0.0000	0.0000
Co-64	0.30000	s	10.00	6.7304E+15	4.2028E+05	0.1800	3.3300	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1988E+19	1.6284E+05	0.0018	0.5952	0.0000	0.0000
Al-30	3.6500	s	1.64	2.8574E+16	1.4666E+05	3.4820	2.2990	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8931E+18	1.4550E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4083E+18	1.2965E+05	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	4.2594E+16	1.1191E+05	4.6030	2.6930	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1837E+18	1.0393E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5667E+17	9.5056E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6539E+19	8.0661E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5723E+17	5.9147E+04	4.1000	1.4680	0.0000	0.0000
Hf-177m	1.0800	s	5.56	2.6132E+15	4.5328E+04	1.0640	0.2404	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.0264E+21	2.3174E+04	0.0001	0.1269	0.0000	0.0000
P-34	12.400	s	0.81	1.4797E+16	2.2356E+04	0.3344	2.3020	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.6096E+16	2.1858E+04	2.3780	1.7530	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000	0.0000
C-15	2.4490	s	0.20	1.4635E+15	1.1195E+04	3.3580	2.9960	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0166E+17	1.0529E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5777E+17	1.0275E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3335E+16	8875.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4809E+17	8190.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3530E+16	2698.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8611E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7448E+17	1394.	0.9860	0.0888	0.0000	0.0000
N-17	4.1700	s	0.10	2.5831E+14	1160.	0.0420	1.7200	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0307E+16	990.7	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3659E+17	870.3	0.1450	0.6334	0.0000	0.0000
O-19	26.910	s	0.30	1.2160E+15	846.5	0.9398	1.7770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.38775E+11

Total number of decays = 1.84466E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.10505
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12877
 Average beta E (MeV) = 2.09749E-03
 Average alpha E (MeV) = 1.76401E-11

Composite Exposure Rate Conversion Factor = 1.80155301 R/hr per Ci/m2
 Composite ECF per FGR table = 7.27213174E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.60963488 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.437503278 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.7764E+22	1.3476E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9828E+21	1.4952E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	7.0138E+18	4.6429E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1447E+22	1.8430E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5525E+20	4.0153E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9770E+20	2.4820E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0770E+19	2.0841E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3869E+20	1.9314E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.3108E+18	6.1389E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.5021E+19	5.4900E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8702E+19	3.6044E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4369E+19	1.9196E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1579E+20	8.5860E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	6.8266E+16	4.7365E+05	0.0569	2.8120	0.0000
Co-64	0.30000	s	10.00	5.5023E+15	3.4360E+05	0.1800	3.3300	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1987E+19	1.6284E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8926E+18	1.4549E+05	1.5700	1.0570	0.0000
Al-30	3.6500	s	1.64	2.8105E+16	1.4425E+05	3.4820	2.2990	0.0000
Ti-51	5.8000	m	0.52	2.4079E+18	1.2962E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.2235E+16	1.1097E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1833E+18	1.0392E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5636E+17	9.4993E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6539E+19	8.0660E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5704E+17	5.9075E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.4710E+15	4.2862E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2799E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0312E+21	2.3187E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4725E+16	2.2247E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.6026E+16	2.1838E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
C-15	2.4490	s	0.20	1.4278E+15	1.0922E+04	3.3580	2.9960	0.0000
Fe-61	5.9800	m	1.00	2.0163E+17	1.0528E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5773E+17	1.0274E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3306E+16	8871.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4807E+17	8189.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8650E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3550E+16	2699.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8611E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7448E+17	1393.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.5460E+14	1144.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0304E+16	990.5	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3659E+17	870.3	0.1450	0.6334	0.0000
O-19	26.910	s	0.30	1.2133E+15	844.6	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.37103E+11

Total number of decays = 2.28966E+21
Asympt number of decays = 1.75603E+24
Percent of decays = 0.13039
Average chain length = 1.5377

Average gamma E (MeV) = 0.12889
Average beta E (MeV) = 2.11069E-03
Average alpha E (MeV) = 1.62646E-11

Composite Exposure Rate Conversion Factor = 1.80354881 R/hr per Ci/m2
Composite ECF per FGR table = 6.98696375E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.61107826 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.546398699 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.7225E+22	1.3283E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9767E+21	1.4940E+09	0.0274	0.0000	0.0000
Ta-182m	0.28300	s	1.06	5.3718E+18	3.5560E+08	0.0017	0.0122	0.0000
Mn-56	2.5820	h	0.19	9.1446E+22	1.8430E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5509E+20	4.0139E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9760E+20	2.4811E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0686E+19	2.0757E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3861E+20	1.9303E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.2863E+18	6.0241E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.4999E+19	5.4851E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8687E+19	3.6016E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5740E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4361E+19	1.9193E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1578E+20	8.5859E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	6.6384E+16	4.6060E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Co-64	0.30000	s	10.00	4.2784E+15	2.6717E+05	0.1800	3.3300	0.0000
Si-31	2.6200	h	0.38	8.1987E+19	1.6284E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8921E+18	1.4547E+05	1.5700	1.0570	0.0000
Al-30	3.6500	s	1.64	2.7530E+16	1.4130E+05	3.4820	2.2990	0.0000
Ti-51	5.8000	m	0.52	2.4074E+18	1.2960E+05	0.3692	0.8684	0.0000
N-16	7.1300	s	0.28	4.1790E+16	1.0980E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1829E+18	1.0390E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5598E+17	9.4913E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6538E+19	8.0658E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5680E+17	5.8986E+04	4.1000	1.4680	0.0000
Hf-177m	1.0800	s	5.56	2.3042E+15	3.9968E+04	1.0640	0.2404	0.0000
Co-61	1.6500	h	0.30	1.0400E+19	3.2798E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0373E+21	2.3205E+04	0.0001	0.1269	0.0000
P-34	12.400	s	0.81	1.4636E+16	2.2112E+04	0.3344	2.3020	0.0000
Mn-58m	1.0870	m	0.77	7.5938E+16	2.1812E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5740E+21	1.0936E+04	0.9770	0.0036	0.0000
C-15	2.4490	s	0.20	1.3845E+15	1.0590E+04	3.3580	2.9960	0.0000
Fe-61	5.9800	m	1.00	2.0159E+17	1.0525E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5769E+17	1.0274E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.3271E+16	8867.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4803E+17	8188.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8649E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3575E+16	2699.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8612E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7447E+17	1393.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.5003E+14	1123.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0300E+16	990.3	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3658E+17	870.3	0.1450	0.6334	0.0000
O-19	26.910	s	0.30	1.2099E+15	842.3	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.35069E+11

Total number of decays = 2.83794E+21
Asympt number of decays = 1.75603E+24
Percent of decays = 0.16161
Average chain length = 1.5377

Average gamma E (MeV) = 0.12901
Average beta E (MeV) = 2.12993E-03
Average alpha E (MeV) = 1.62604E-11

Composite Exposure Rate Conversion Factor = 1.80570877 R/hr per Ci/m2
Composite ECF per FGR table = 6.71797320E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.61258221 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.682398140 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	3.6563E+22	1.3047E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9692E+21	1.4926E+09	0.0274	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	3.8500E+18	2.5486E+08	0.0017	0.0122	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1445E+22	1.8430E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5489E+20	4.0121E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9747E+20	2.4801E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.0582E+19	2.0652E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3851E+20	1.9290E+07	1.7790	1.2470	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.2563E+18	5.8838E+06	1.0026	0.1430	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4971E+19	5.4791E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8669E+19	3.5981E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5739E+21	2.0897E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4352E+19	1.9190E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1578E+20	8.5858E+05	0.5583	0.6276	0.0000	0.0000
Mn-58	2.7000	s	22.22	6.4106E+16	4.4479E+05	0.0569	2.8120	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Co-64	0.30000	s	10.00	3.1247E+15	1.9513E+05	0.1800	3.3300	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1986E+19	1.6284E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8913E+18	1.4545E+05	1.5700	1.0570	0.0000	0.0000
Al-30	3.6500	s	1.64	2.6828E+16	1.3770E+05	3.4820	2.2990	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4067E+18	1.2956E+05	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	4.1241E+16	1.0836E+05	4.6030	2.6930	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1824E+18	1.0387E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5550E+17	9.4814E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6538E+19	8.0656E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5651E+17	5.8874E+04	4.1000	1.4680	0.0000	0.0000
Hf-177m	1.0800	s	5.56	2.1116E+15	3.6628E+04	1.0640	0.2404	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0399E+19	3.2798E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.0448E+21	2.3227E+04	0.0001	0.1269	0.0000	0.0000
P-34	12.400	s	0.81	1.4525E+16	2.1944E+04	0.3344	2.3020	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.5828E+16	2.1781E+04	2.3780	1.7530	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5741E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0153E+17	1.0523E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5764E+17	1.0272E+04	2.6830	1.0620	0.0000	0.0000
C-15	2.4490	s	0.20	1.3322E+15	1.0191E+04	3.3580	2.9960	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3226E+16	8862.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4799E+17	8187.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8649E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3606E+16	2701.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8612E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7446E+17	1393.	0.9860	0.0888	0.0000	0.0000
N-17	4.1700	s	0.10	2.4444E+14	1098.	0.0420	1.7200	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0295E+16	990.1	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3658E+17	870.3	0.1450	0.6334	0.0000	0.0000
O-19	26.910	s	0.30	1.2056E+15	839.3	0.9398	1.7770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.32603E+11

Total number of decays = 3.51137E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.19996
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12913
 Average beta E (MeV) = 2.15742E-03
 Average alpha E (MeV) = 1.63435E-11

Composite Exposure Rate Conversion Factor = 1.80800605 R/hr per Ci/m2
 Composite ECF per FGR table = 6.48808628E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.61409938 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 0.852248371 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	3.5752E+22	1.2758E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9598E+21	1.4909E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1444E+22	1.8430E+08	1.6910	0.8309	0.0000	0.0000
Ta-182m	0.28300	s	1.06	2.5397E+18	1.6812E+08	0.0017	0.0122	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5463E+20	4.0099E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9732E+20	2.4788E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.0453E+19	2.0522E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3839E+20	1.9273E+07	1.7790	1.2470	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.2199E+18	5.7131E+06	1.0026	0.1430	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4937E+19	5.4715E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8646E+19	3.5938E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5739E+21	2.0897E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4339E+19	1.9187E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1577E+20	8.5857E+05	0.5583	0.6276	0.0000	0.0000
Mn-58	2.7000	s	22.22	6.1371E+16	4.2581E+05	0.0569	2.8120	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1985E+19	1.6284E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8904E+18	1.4542E+05	1.5700	1.0570	0.0000	0.0000
Al-30	3.6500	s	1.64	2.5977E+16	1.3332E+05	3.4820	2.2990	0.0000	0.0000
Co-64	0.30000	s	10.00	2.1105E+15	1.3179E+05	0.1800	3.3300	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4059E+18	1.2952E+05	0.3692	0.8684	0.0000	0.0000
N-16	7.1300	s	0.28	4.0566E+16	1.0658E+05	4.6030	2.6930	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1817E+18	1.0384E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5491E+17	9.4690E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6537E+19	8.0654E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5614E+17	5.8735E+04	4.1000	1.4680	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.8935E+15	3.2845E+04	1.0640	0.2404	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0399E+19	3.2798E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.0542E+21	2.3254E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.5691E+16	2.1741E+04	2.3780	1.7530	0.0000	0.0000
P-34	12.400	s	0.81	1.4388E+16	2.1737E+04	0.3344	2.3020	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5741E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0147E+17	1.0519E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5758E+17	1.0271E+04	2.6830	1.0620	0.0000	0.0000
C-15	2.4490	s	0.20	1.2696E+15	9712.	3.3580	2.9960	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3170E+16	8855.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4794E+17	8185.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8649E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3645E+16	2702.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8612E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7446E+17	1393.	0.9860	0.0888	0.0000	0.0000
N-17	4.1700	s	0.10	2.3763E+14	1068.	0.0420	1.7200	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0289E+16	989.8	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3657E+17	870.2	0.1450	0.6334	0.0000	0.0000
O-19	26.910	s	0.30	1.2004E+15	835.6	0.9398	1.7770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.29621E+11

Total number of decays = 4.33529E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.24688
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12925
 Average beta E (MeV) = 2.19595E-03
 Average alpha E (MeV) = 1.64456E-11

Composite Exposure Rate Conversion Factor = 1.81042612 R/hr per Ci/m2
 Composite ECF per FGR table = 6.32244870E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.61558533 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.06437480 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.4765E+22	1.2405E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9482E+21	1.4887E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1443E+22	1.8430E+08	1.6910	0.8309	0.0000
Ta-182m	0.28300	s	1.06	1.5106E+18	9.9996E+07	0.0017	0.0122	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5432E+20	4.0071E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9712E+20	2.4772E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	2.0292E+19	2.0361E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3824E+20	1.9252E+07	1.7790	1.2470	0.0000
Hf-178m	4.0000	s	7.50	1.1758E+18	5.5069E+06	1.0026	0.1430	0.0000
Mn-57	1.4230	m	2.11	2.4894E+19	5.4621E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8618E+19	3.5883E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5739E+21	2.0897E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4324E+19	1.9182E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1577E+20	8.5856E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	5.8118E+16	4.0325E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1984E+19	1.6283E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8893E+18	1.4539E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4049E+18	1.2946E+05	0.3692	0.8684	0.0000
Al-30	3.6500	s	1.64	2.4951E+16	1.2806E+05	3.4820	2.2990	0.0000
N-16	7.1300	s	0.28	3.9738E+16	1.0441E+05	4.6030	2.6930	0.0000
Al-29	6.5600	m	0.91	2.1809E+18	1.0380E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.5417E+17	9.4536E+04	1.5990	1.6430	0.0000
Co-64	0.30000	s	10.00	1.2928E+15	8.0728E+04	0.1800	3.3300	0.0000
Hf-183	1.0670	h	1.59	1.6537E+19	8.0651E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5568E+17	5.8562E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0399E+19	3.2797E+04	0.0970	0.4590	0.0000
Hf-177m	1.0800	s	5.56	1.6525E+15	2.8664E+04	1.0640	0.2404	0.0000
W-185	75.100	d	0.40	8.0658E+21	2.3287E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.5521E+16	2.1693E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.4218E+16	2.1481E+04	0.3344	2.3020	0.0000
Hf-180m	5.5000	h	1.82	1.2850E+19	1.2158E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5741E+21	1.0936E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0139E+17	1.0515E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5750E+17	1.0269E+04	2.6830	1.0620	0.0000
C-15	2.4490	s	0.20	1.1957E+15	9146.	3.3580	2.9960	0.0000
Fe-53m	2.5800	m	1.16	7.3101E+16	8847.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4788E+17	8183.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8649E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3693E+16	2704.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8613E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7445E+17	1393.	0.9860	0.0888	0.0000
N-17	4.1700	s	0.10	2.2940E+14	1031.	0.0420	1.7200	0.0000
W-179m	6.4000	m	1.09	2.0281E+16	989.4	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3657E+17	870.2	0.1450	0.6334	0.0000
O-19	26.910	s	0.30	1.1938E+15	831.1	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.26026E+11

Total number of decays = 5.33844E+21
Asympt number of decays = 1.75603E+24
Percent of decays = 0.30401
Average chain length = 1.5377

Average gamma E (MeV) = 0.12936
Average beta E (MeV) = 2.24899E-03
Average alpha E (MeV) = 1.65694E-11

Composite Exposure Rate Conversion Factor = 1.81298840 R/hr per Ci/m2
Composite ECF per FGR table = 6.24480583E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.61701572 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.32929909 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	3.3570E+22	1.1979E+11	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9336E+21	1.4860E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1441E+22	1.8429E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5842E+07	0.4476	0.2710	0.0000	0.0000
Ta-182m	0.28300	s	1.06	7.8948E+17	5.2261E+07	0.0017	0.0122	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5393E+20	4.0036E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9688E+20	2.4752E+07	1.4450	1.0680	0.0000	0.0000
Hf-179m	18.670	s	0.21	2.0093E+19	2.0162E+07	0.2370	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3805E+20	1.9225E+07	1.7790	1.2470	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4840E+19	5.4504E+06	0.0976	1.0900	0.0000	0.0000
Hf-178m	4.0000	s	7.50	1.1231E+18	5.2599E+06	1.0026	0.1430	0.0000	0.0000
V-53	1.6200	m	2.47	1.8583E+19	3.5816E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5739E+21	2.0896E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4306E+19	1.9177E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1576E+20	8.5854E+05	0.5583	0.6276	0.0000	0.0000
Mn-58	2.7000	s	22.22	5.4297E+16	3.7673E+05	0.0569	2.8120	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1982E+19	1.6283E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8878E+18	1.4535E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.4036E+18	1.2939E+05	0.3692	0.8684	0.0000	0.0000
Al-30	3.6500	s	1.64	2.3727E+16	1.2178E+05	3.4820	2.2990	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1799E+18	1.0375E+05	1.3790	0.9765	0.0000	0.0000
N-16	7.1300	s	0.28	3.8728E+16	1.0175E+05	4.6030	2.6930	0.0000	0.0000
Co-62	1.5000	m	2.67	4.5324E+17	9.4343E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6536E+19	8.0647E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5510E+17	5.8347E+04	4.1000	1.4680	0.0000	0.0000
Co-64	0.30000	s	10.00	7.0095E+14	4.3771E+04	0.1800	3.3300	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0399E+19	3.2796E+04	0.0970	0.4590	0.0000	0.0000
Hf-177m	1.0800	s	5.56	1.3941E+15	2.4182E+04	1.0640	0.2404	0.0000	0.0000
W-185	75.100	d	0.40	8.0804E+21	2.3329E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.5309E+16	2.1632E+04	2.3780	1.7530	0.0000	0.0000
P-34	12.400	s	0.81	1.4009E+16	2.1165E+04	0.3344	2.3020	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2849E+19	1.2157E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5741E+21	1.0936E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0128E+17	1.0509E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5739E+17	1.0267E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.3014E+16	8836.	3.0540	0.0000	0.0000	0.0000
C-15	2.4490	s	0.20	1.1093E+15	8486.	3.3580	2.9960	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4780E+17	8180.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8649E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.3753E+16	2706.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8614E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7443E+17	1393.	0.9860	0.0888	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0271E+16	988.9	0.0552	0.0000	0.0000	0.0000
N-17	4.1700	s	0.10	2.1952E+14	986.2	0.0420	1.7200	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3656E+17	870.1	0.1450	0.6334	0.0000	0.0000
O-19	26.910	s	0.30	1.1857E+15	825.4	0.9398	1.7770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.21711E+11

Total number of decays = 6.55249E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.37314
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12947
 Average beta E (MeV) = 2.32086E-03
 Average alpha E (MeV) = 1.67206E-11

Composite Exposure Rate Conversion Factor = 1.81577373 R/hr per Ci/m2
 Composite ECF per FGR table = 6.27376661E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.61840510 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.66016436 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	gamma	Total Energy Output (Mev)		
						beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.2135E+22	1.1467E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.9154E+21	1.4826E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1439E+22	1.8429E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4760E+23	7.5841E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5344E+20	3.9993E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9658E+20	2.4726E+07	1.4450	1.0680	0.0000
Ta-182m	0.28300	s	1.06	3.5107E+17	2.3240E+07	0.0017	0.0122	0.0000
Hf-179m	18.670	s	0.21	1.9848E+19	1.9916E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3782E+20	1.9193E+07	1.7790	1.2470	0.0000
Mn-57	1.4230	m	2.11	2.4774E+19	5.4358E+06	0.0976	1.0900	0.0000
Hf-178m	4.0000	s	7.50	1.0605E+18	4.9668E+06	1.0026	0.1430	0.0000
V-53	1.6200	m	2.47	1.8539E+19	3.5731E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5739E+21	2.0896E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4282E+19	1.9170E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1575E+20	8.5852E+05	0.5583	0.6276	0.0000
Mn-58	2.7000	s	22.22	4.9875E+16	3.4605E+05	0.0569	2.8120	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1980E+19	1.6283E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8861E+18	1.4529E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4020E+18	1.2931E+05	0.3692	0.8684	0.0000
Al-30	3.6500	s	1.64	2.2282E+16	1.1436E+05	3.4820	2.2990	0.0000
Al-29	6.5600	m	0.91	2.1786E+18	1.0369E+05	1.3790	0.9765	0.0000
N-16	7.1300	s	0.28	3.7502E+16	9.8534E+04	4.6030	2.6930	0.0000
Co-62	1.5000	m	2.67	4.5209E+17	9.4103E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6535E+19	8.0642E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5439E+17	5.8079E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0399E+19	3.2795E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.0986E+21	2.3382E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.5044E+16	2.1556E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.3753E+16	2.0777E+04	0.3344	2.3020	0.0000
Co-64	0.30000	s	10.00	3.2635E+14	2.0379E+04	0.1800	3.3300	0.0000
Hf-177m	1.0800	s	5.56	1.1274E+15	1.9556E+04	1.0640	0.2404	0.0000
Hf-180m	5.5000	h	1.82	1.2849E+19	1.2157E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5741E+21	1.0937E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	2.0115E+17	1.0503E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5727E+17	1.0264E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.2906E+16	8823.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4770E+17	8177.	0.8914	0.7010	0.0000
C-15	2.4490	s	0.20	1.0101E+15	7727.	3.3580	2.9960	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8648E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3828E+16	2709.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8615E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7441E+17	1393.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	2.0259E+16	988.4	0.0552	0.0000	0.0000
N-17	4.1700	s	0.10	2.0777E+14	933.4	0.0420	1.7200	0.0000
Ta-185	49.000	m	4.08	1.3655E+17	870.1	0.1450	0.6334	0.0000
O-19	26.910	s	0.30	1.1756E+15	818.4	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.16558E+11

Total number of decays = 8.01068E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.45618
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12959
 Average beta E (MeV) = 2.41717E-03
 Average alpha E (MeV) = 1.69072E-11

Composite Exposure Rate Conversion Factor = 1.81894863 R/hr per Ci/m2
 Composite ECF per FGR table = 6.42120987E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.61982250 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.07338262 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	gamma	Total Energy Output (Mev)		
						beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	3.0429E+22	1.0858E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.8928E+21	1.4783E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1436E+22	1.8428E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4759E+23	7.5841E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5283E+20	3.9939E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9620E+20	2.4695E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	1.9546E+19	1.9613E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3752E+20	1.9152E+07	1.7790	1.2470	0.0000
Ta-182m	0.28300	s	1.06	1.2760E+17	8.4467E+06	0.0017	0.0122	0.0000
Mn-57	1.4230	m	2.11	2.4691E+19	5.4176E+06	0.0976	1.0900	0.0000
Hf-178m	4.0000	s	7.50	9.8722E+17	4.6236E+06	1.0026	0.1430	0.0000
V-53	1.6200	m	2.47	1.8485E+19	3.5626E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5738E+21	2.0896E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4253E+19	1.9161E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1573E+20	8.5849E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Mn-58	2.7000	s	22.22	4.4855E+16	3.1122E+05	0.0569	2.8120	0.0000
Si-31	2.6200	h	0.38	8.1978E+19	1.6282E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8838E+18	1.4523E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.4001E+18	1.2920E+05	0.3692	0.8684	0.0000
Al-30	3.6500	s	1.64	2.0600E+16	1.0573E+05	3.4820	2.2990	0.0000
Al-29	6.5600	m	0.91	2.1770E+18	1.0362E+05	1.3790	0.9765	0.0000
N-16	7.1300	s	0.28	3.6025E+16	9.4654E+04	4.6030	2.6930	0.0000
Co-62	1.5000	m	2.67	4.5065E+17	9.3805E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6534E+19	8.0636E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5351E+17	5.7746E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0398E+19	3.2794E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.1212E+21	2.3447E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.4715E+16	2.1461E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.3439E+16	2.0303E+04	0.3344	2.3020	0.0000
Hf-177m	1.0800	s	5.56	8.6476E+14	1.5000E+04	1.0640	0.2404	0.0000
Hf-180m	5.5000	h	1.82	1.2849E+19	1.2157E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5742E+21	1.0937E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	2.0099E+17	1.0494E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5711E+17	1.0260E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.2771E+16	8807.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4757E+17	8173.	0.8914	0.7010	0.0000
Co-64	0.30000	s	10.00	1.2562E+14	7844.	0.1800	3.3300	0.0000
C-15	2.4490	s	0.20	8.9863E+14	6874.	3.3580	2.9960	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8648E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.3921E+16	2712.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8616E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7439E+17	1393.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	2.0244E+16	987.6	0.0552	0.0000	0.0000
N-17	4.1700	s	0.10	1.9398E+14	871.5	0.0420	1.7200	0.0000
Ta-185	49.000	m	4.08	1.3653E+17	870.0	0.1450	0.6334	0.0000
O-19	26.910	s	0.30	1.1632E+15	809.8	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 1.10450E+11

Total number of decays = 9.74561E+21
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.55498
 Average chain length = 1.5377

Average gamma E (MeV) = 0.12971
 Average beta E (MeV) = 2.54555E-03
 Average alpha E (MeV) = 1.71397E-11

Composite Exposure Rate Conversion Factor = 1.82278359 R/hr per Ci/m2
 Composite ECF per FGR table = 6.69516250E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.62139678 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.58945155 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	2.8424E+22	1.0143E+11	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.8646E+21	1.4730E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1432E+22	1.8427E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4759E+23	7.5841E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.5206E+20	3.9872E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9573E+20	2.4655E+07	1.4450	1.0680	0.0000
Hf-179m	18.670	s	0.21	1.9175E+19	1.9240E+07	0.2370	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3716E+20	1.9101E+07	1.7790	1.2470	0.0000
Mn-57	1.4230	m	2.11	2.4588E+19	5.3949E+06	0.0976	1.0900	0.0000
Hf-178m	4.0000	s	7.50	9.0276E+17	4.2280E+06	1.0026	0.1430	0.0000
V-53	1.6200	m	2.47	1.8417E+19	3.5495E+06	1.0380	1.0090	0.0000
Ta-182m	0.28300	s	1.06	3.6050E+16	2.3864E+06	0.0017	0.0122	0.0000
Co-58m	8.9000	h	1.12	3.5738E+21	2.0896E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4216E+19	1.9150E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1572E+20	8.5846E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Mn-58	2.7000	s	22.22	3.9289E+16	2.7261E+05	0.0569	2.8120	0.0000
Si-31	2.6200	h	0.38	8.1974E+19	1.6282E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8811E+18	1.4514E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.3976E+18	1.2907E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	2.1751E+18	1.0352E+05	1.3790	0.9765	0.0000
Al-30	3.6500	s	1.64	1.8677E+16	9.5860E+04	3.4820	2.2990	0.0000
Co-62	1.5000	m	2.67	4.4887E+17	9.3433E+04	1.5990	1.6430	0.0000
N-16	7.1300	s	0.28	3.4262E+16	9.0022E+04	4.6030	2.6930	0.0000
Hf-183	1.0670	h	1.59	1.6532E+19	8.0629E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.5241E+17	5.7332E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0398E+19	3.2793E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.1494E+21	2.3529E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.4307E+16	2.1344E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.3056E+16	1.9726E+04	0.3344	2.3020	0.0000
Hf-180m	5.5000	h	1.82	1.2849E+19	1.2157E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5742E+21	1.0937E+04	0.9770	0.0036	0.0000
Hf-177m	1.0800	s	5.56	6.2094E+14	1.0771E+04	1.0640	0.2404	0.0000
Fe-61	5.9800	m	1.00	2.0079E+17	1.0484E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5692E+17	1.0256E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.2603E+16	8786.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4742E+17	8168.	0.8914	0.7010	0.0000
C-15	2.4490	s	0.20	7.7651E+14	5940.	3.3580	2.9960	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8647E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.4037E+16	2716.	1.2070	0.0000	1.1050
Co-64	0.30000	s	10.00	3.8125E+13	2381.	0.1800	3.3300	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8618E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7437E+17	1393.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	2.0225E+16	986.7	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3652E+17	869.9	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
N-17	4.1700	s	0.10	1.7803E+14	799.8	0.0420	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 1.03286E+11

Total number of decays = 1.17854E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 0.67114
Average chain length = 1.5377

Average gamma E (MeV) = 0.12986
Average beta E (MeV) = 2.71705E-03
Average alpha E (MeV) = 1.74317E-11

Composite Exposure Rate Conversion Factor = 1.82766569 R/hr per Ci/m2
Composite ECF per FGR table = 7.10785836E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.62331152 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.23397112 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	2.6106E+22	9.3154E+10	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.8295E+21	1.4665E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1428E+22	1.8427E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4759E+23	7.5841E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.5111E+20	3.9788E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9514E+20	2.4607E+07	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3670E+20	1.9038E+07	1.7790	1.2470	0.0000	0.0000
Hf-179m	18.670	s	0.21	1.8722E+19	1.8786E+07	0.2370	0.0000	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4459E+19	5.3668E+06	0.0976	1.0900	0.0000	0.0000
Hf-178m	4.0000	s	7.50	8.0736E+17	3.7812E+06	1.0026	0.1430	0.0000	0.0000
V-53	1.6200	m	2.47	1.8332E+19	3.5333E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5737E+21	2.0896E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4171E+19	1.9136E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1570E+20	8.5842E+05	0.5583	0.6276	0.0000	0.0000
Ta-182m	0.28300	s	1.06	7.4357E+15	4.9222E+05	0.0017	0.0122	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Mn-58	2.7000	s	22.22	3.3298E+16	2.3103E+05	0.0569	2.8120	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1971E+19	1.6281E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8776E+18	1.4504E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.3945E+18	1.2890E+05	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1726E+18	1.0341E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.4665E+17	9.2971E+04	1.5990	1.6430	0.0000	0.0000
Al-30	3.6500	s	1.64	1.6525E+16	8.4817E+04	3.4820	2.2990	0.0000	0.0000
N-16	7.1300	s	0.28	3.2181E+16	8.4555E+04	4.6030	2.6930	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6530E+19	8.0619E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.5105E+17	5.6820E+04	4.1000	1.4680	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0397E+19	3.2791E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.1845E+21	2.3630E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.3799E+16	2.1198E+04	2.3780	1.7530	0.0000	0.0000
P-34	12.400	s	0.81	1.2594E+16	1.9027E+04	0.3344	2.3020	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2849E+19	1.2157E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5742E+21	1.0937E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0054E+17	1.0471E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5667E+17	1.0251E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.2394E+16	8761.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4722E+17	8161.	0.8914	0.7010	0.0000	0.0000
Hf-177m	1.0800	s	5.56	4.1059E+14	7122.	1.0640	0.2404	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
C-15	2.4490	s	0.20	6.4703E+14	4949.	3.3580	2.9960	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8647E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.4182E+16	2722.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8619E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7433E+17	1393.	0.9860	0.0888	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0202E+16	985.6	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3650E+17	869.8	0.1450	0.6334	0.0000	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000	0.0000
O-19	26.910	s	0.30	1.1289E+15	785.9	0.9398	1.7770	0.0000	0.0000
Co-63	27.400	s	1.83	1.0587E+15	723.9	0.1437	1.5310	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
Total activity (Ci) = 9.50023E+10

Total number of decays = 1.41483E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 0.80570
Average chain length = 1.5377

Average gamma E (MeV) = 0.13006
Average beta E (MeV) = 2.94832E-03
Average alpha E (MeV) = 1.78006E-11

Composite Exposure Rate Conversion Factor = 1.83413112 R/hr per Ci/m2
Composite ECF per FGR table = 7.68726245E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.62580633 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 4.03891134 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	2.3474E+22	8.3762E+10	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.7860E+21	1.4583E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1422E+22	1.8425E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4759E+23	7.5840E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.4993E+20	3.9684E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9441E+20	2.4545E+07	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3614E+20	1.8959E+07	1.7790	1.2470	0.0000	0.0000
Hf-179m	18.670	s	0.21	1.8170E+19	1.8232E+07	0.2370	0.0000	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4300E+19	5.3318E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.8227E+19	3.5130E+06	1.0380	1.0090	0.0000	0.0000
Hf-178m	4.0000	s	7.50	7.0225E+17	3.2889E+06	1.0026	0.1430	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5737E+21	2.0895E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.4114E+19	1.9119E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1567E+20	8.5836E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Mn-58	2.7000	s	22.22	2.7081E+16	1.8790E+05	0.0569	2.8120	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1966E+19	1.6280E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8733E+18	1.4491E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.3907E+18	1.2870E+05	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1695E+18	1.0326E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.4389E+17	9.2397E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6528E+19	8.0608E+04	0.7528	0.4179	0.0000	0.0000
N-16	7.1300	s	0.28	2.9759E+16	7.8190E+04	4.6030	2.6930	0.0000	0.0000
Al-30	3.6500	s	1.64	1.4183E+16	7.2794E+04	3.4820	2.2990	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.0354E+15	6.8541E+04	0.0017	0.0122	0.0000	0.0000
V-54	49.800	s	1.00	1.4936E+17	5.6187E+04	4.1000	1.4680	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0397E+19	3.2789E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.2280E+21	2.3756E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.3171E+16	2.1017E+04	2.3780	1.7530	0.0000	0.0000
P-34	12.400	s	0.81	1.2040E+16	1.8190E+04	0.3344	2.3020	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2848E+19	1.2156E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5743E+21	1.0937E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	2.0023E+17	1.0455E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5637E+17	1.0244E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.2134E+16	8730.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4698E+17	8153.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Hf-177m	1.0800	s	5.56	2.4493E+14	4249.	1.0640	0.2404	0.0000	0.0000
C-15	2.4490	s	0.20	5.1521E+14	3941.	3.3580	2.9960	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8646E+18	2910.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.4361E+16	2728.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8622E+19	1645.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7429E+17	1393.	0.9860	0.0888	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0172E+16	984.1	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3647E+17	869.6	0.1450	0.6334	0.0000	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000	0.0000
O-19	26.910	s	0.30	1.1058E+15	769.8	0.9398	1.7770	0.0000	0.0000
Co-63	27.400	s	1.83	1.0374E+15	709.3	0.1437	1.5310	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 144
 Total activity (Ci) = 8.56003E+10

Total number of decays = 1.68353E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 0.95871
 Average chain length = 1.5377

Average gamma E (MeV) = 0.13034
 Average beta E (MeV) = 3.26516E-03
 Average alpha E (MeV) = 1.82687E-11

Composite Exposure Rate Conversion Factor = 1.84294450 R/hr per Ci/m2
 Composite ECF per FGR table = 8.48983154E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.62920046 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 5.04420424 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	2.0556E+22	7.3351E+10	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.7319E+21	1.4482E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1416E+22	1.8424E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4759E+23	7.5839E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.4846E+20	3.9554E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9350E+20	2.4469E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.3543E+20	1.8861E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.7505E+19	1.7565E+07	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.4102E+19	5.2885E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.8097E+19	3.4879E+06	1.0380	1.0090	0.0000
Hf-178m	4.0000	s	7.50	5.8998E+17	2.7631E+06	1.0026	0.1430	0.0000
Co-58m	8.9000	h	1.12	3.5736E+21	2.0895E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.4043E+19	1.9098E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1564E+20	8.5830E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1960E+19	1.6279E+05	0.0018	0.5952	0.0000
Mn-58	2.7000	s	22.22	2.0921E+16	1.4516E+05	0.0569	2.8120	0.0000
Ta-186	10.500	m	2.86	4.8679E+18	1.4475E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.3859E+18	1.2844E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	2.1657E+18	1.0308E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.4047E+17	9.1685E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6525E+19	8.0593E+04	0.7528	0.4179	0.0000
N-16	7.1300	s	0.28	2.6988E+16	7.0910E+04	4.6030	2.6930	0.0000
Al-30	3.6500	s	1.64	1.1718E+16	6.0143E+04	3.4820	2.2990	0.0000
V-54	49.800	s	1.00	1.4729E+17	5.5406E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0396E+19	3.2787E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.2821E+21	2.3912E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.2393E+16	2.0794E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.1382E+16	1.7196E+04	0.3344	2.3020	0.0000
Hf-180m	5.5000	h	1.82	1.2848E+19	1.2156E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5744E+21	1.0937E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	1.9984E+17	1.0434E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5599E+17	1.0235E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.1810E+16	8690.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4668E+17	8143.	0.8914	0.7010	0.0000
Ta-182m	0.28300	s	1.06	8.8300E+13	5845.	0.0017	0.0122	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
C-15	2.4490	s	0.20	3.8762E+14	2965.	3.3580	2.9960	0.0000
Ta-184	8.7000	h	1.15	4.8645E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.4584E+16	2736.	1.2070	0.0000	1.1050
Hf-177m	1.0800	s	5.56	1.2848E+14	2229.	1.0640	0.2404	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8625E+19	1645.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7424E+17	1392.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	2.0136E+16	982.3	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3644E+17	869.4	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
O-19	26.910	s	0.30	1.0775E+15	750.1	0.9398	1.7770	0.0000
Co-63	27.400	s	1.83	1.0114E+15	691.5	0.1437	1.5310	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 143
 Total activity (Ci) = 7.51772E+10

Total number of decays = 1.98211E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 1.1287
 Average chain length = 1.5377

Average gamma E (MeV) = 0.13072
 Average beta E (MeV) = 3.70875E-03
 Average alpha E (MeV) = 1.88649E-11

Composite Exposure Rate Conversion Factor = 1.85527003 R/hr per Ci/m2
 Composite ECF per FGR table = 9.61618200E-02 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.63396180 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 6.29971647 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	1.7416E+22	6.2146E+10	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.6650E+21	1.4356E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1407E+22	1.8422E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4758E+23	7.5839E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.4662E+20	3.9392E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.9236E+20	2.4375E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.3456E+20	1.8739E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.6708E+19	1.6765E+07	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.3858E+19	5.2348E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.7936E+19	3.4568E+06	1.0380	1.0090	0.0000
Hf-178m	4.0000	s	7.50	4.7462E+17	2.2229E+06	1.0026	0.1430	0.0000
Co-58m	8.9000	h	1.12	3.5735E+21	2.0894E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.3954E+19	1.9072E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1560E+20	8.5822E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1952E+19	1.6277E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8612E+18	1.4455E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.3799E+18	1.2812E+05	0.3692	0.8684	0.0000
Mn-58	2.7000	s	22.22	1.5157E+16	1.0516E+05	0.0569	2.8120	0.0000
Al-29	6.5600	m	0.91	2.1609E+18	1.0285E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.3624E+17	9.0804E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6521E+19	8.0575E+04	0.7528	0.4179	0.0000
N-16	7.1300	s	0.28	2.3887E+16	6.2763E+04	4.6030	2.6930	0.0000
V-54	49.800	s	1.00	1.4474E+17	5.4447E+04	4.1000	1.4680	0.0000
Al-30	3.6500	s	1.64	9.2322E+15	4.7385E+04	3.4820	2.2990	0.0000
Co-61	1.6500	h	0.30	1.0395E+19	3.2783E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.3490E+21	2.4105E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	7.1434E+16	2.0518E+04	2.3780	1.7530	0.0000
P-34	12.400	s	0.81	1.0611E+16	1.6031E+04	0.3344	2.3020	0.0000
Hf-180m	5.5000	h	1.82	1.2847E+19	1.2155E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5745E+21	1.0938E+04	0.9770	0.0036	0.0300
Fe-61	5.9800	m	1.00	1.9936E+17	1.0409E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5551E+17	1.0225E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	7.1407E+16	8642.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4630E+17	8131.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8643E+18	2910.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.4859E+16	2747.	1.2070	0.0000	1.1050
C-15	2.4490	s	0.20	2.7170E+14	2078.	3.3580	2.9960	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8628E+19	1646.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7418E+17	1392.	0.9860	0.0888	0.0000
Hf-177m	1.0800	s	5.56	5.7396E+13	995.6	1.0640	0.2404	0.0000
W-179m	6.4000	m	1.09	2.0090E+16	980.1	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3640E+17	869.1	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
O-19	26.910	s	0.30	1.0432E+15	726.2	0.9398	1.7770	0.0000
Co-63	27.400	s	1.83	9.7973E+14	669.9	0.1437	1.5310	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 6.39583E+10

Total number of decays = 2.30456E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 1.3124
Average chain length = 1.5377

Average gamma E (MeV) = 0.13127
Average beta E (MeV) = 4.34701E-03
Average alpha E (MeV) = 1.96262E-11

Composite Exposure Rate Conversion Factor = 1.87300217 R/hr per Ci/m2
Composite ECF per FGR table = 0.112380244 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.64084506 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 7.86772490 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	1.4159E+22	5.0525E+10	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.5821E+21	1.4201E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1396E+22	1.8420E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4758E+23	7.5838E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.4434E+20	3.9191E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.9095E+20	2.4257E+07	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420	m	0.13	1.3348E+20	1.8589E+07	1.7790	1.2470	0.0000	0.0000
Hf-179m	18.670	s	0.21	1.5763E+19	1.5817E+07	0.2370	0.0000	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.3556E+19	5.1686E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.7736E+19	3.4184E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5734E+21	2.0894E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.3843E+19	1.9039E+06	0.0066	0.0536	0.0000	0.0000
Hf-178m	4.0000	s	7.50	3.6170E+17	1.6940E+06	1.0026	0.1430	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1555E+20	8.5811E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1943E+19	1.6275E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.8528E+18	1.4430E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.3725E+18	1.2772E+05	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1549E+18	1.0257E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	4.3101E+17	8.9715E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6517E+19	8.0552E+04	0.7528	0.4179	0.0000	0.0000
Mn-58	2.7000	s	22.22	1.0134E+16	7.0315E+04	0.0569	2.8120	0.0000	0.0000
N-16	7.1300	s	0.28	2.0510E+16	5.3889E+04	4.6030	2.6930	0.0000	0.0000
V-54	49.800	s	1.00	1.4161E+17	5.3271E+04	4.1000	1.4680	0.0000	0.0000
Al-30	3.6500	s	1.64	6.8547E+15	3.5182E+04	3.4820	2.2990	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0393E+19	3.2779E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	8.4319E+21	2.4344E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	7.0253E+16	2.0179E+04	2.3780	1.7530	0.0000	0.0000
P-34	12.400	s	0.81	9.7205E+15	1.4686E+04	0.3344	2.3020	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2846E+19	1.2155E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5746E+21	1.0938E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	1.9876E+17	1.0377E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5492E+17	1.0211E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	7.0907E+16	8581.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4583E+17	8115.	0.8914	0.7010	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8642E+18	2909.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.5199E+16	2759.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8633E+19	1646.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7409E+17	1392.	0.9860	0.0888	0.0000	0.0000
C-15	2.4490	s	0.20	1.7432E+14	1333.	3.3580	2.9960	0.0000	0.0000
W-179m	6.4000	m	1.09	2.0033E+16	977.3	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3635E+17	868.8	0.1450	0.6334	0.0000	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000	0.0000
O-19	26.910	s	0.30	1.0019E+15	697.5	0.9398	1.7770	0.0000	0.0000
Co-63	27.400	s	1.83	9.4163E+14	643.8	0.1437	1.5310	0.0000	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000	0.0000
P-30	2.4980	m	0.16	3.9718E+15	496.4	1.0300	0.0000	1.4350	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 141
 Total activity (Ci) = 5.23195E+10

Total number of decays = 2.64070E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 1.5038
 Average chain length = 1.5377

Average gamma E (MeV) = 0.13209
 Average beta E (MeV) = 5.29682E-03
 Average alpha E (MeV) = 2.06000E-11

Composite Exposure Rate Conversion Factor = 1.89938951 R/hr per Ci/m2
 Composite ECF per FGR table = 0.136529371 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.65115190 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 9.82601738 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
W-183m	5.2500 s	1.33	1.0933E+22	3.9014E+10	0.1276	0.0000	0.0000
W-185m	1.6670 m	2.00	7.4799E+21	1.4010E+09	0.0274	0.0000	0.0000
Mn-56	2.5820 h	0.19	9.1383E+22	1.8417E+08	1.6910	0.8309	0.0000
W-187	23.850 h	0.34	3.4757E+23	7.5836E+07	0.4476	0.2710	0.0000
Cr-55	3.5400 m	0.85	4.4151E+20	3.8941E+07	0.0033	1.1010	0.0000
V-52	3.7450 m	0.13	2.8920E+20	2.4111E+07	1.4450	1.0680	0.0000
Al-28	2.2420 m	0.13	1.3214E+20	1.8402E+07	1.7790	1.2470	0.0000
Hf-179m	18.670 s	0.21	1.4657E+19	1.4707E+07	0.2370	0.0000	0.0000
Mn-57	1.4230 m	2.11	2.3185E+19	5.0871E+06	0.0976	1.0900	0.0000
V-53	1.6200 m	2.47	1.7490E+19	3.3710E+06	1.0380	1.0090	0.0000
Co-58m	8.9000 h	1.12	3.5732E+21	2.0893E+06	0.0019	0.0208	0.0000
Co-60m	10.470 m	0.38	6.3706E+19	1.8998E+06	0.0066	0.0536	0.0000
Hf-178m	4.0000 s	7.50	2.5761E+17	1.2065E+06	1.0026	0.1430	0.0000
Ni-65	2.5200 h	0.04	4.1549E+20	8.5798E+05	0.5583	0.6276	0.0000
Cr-51	27.710 d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200 m	0.38	8.1931E+19	1.6273E+05	0.0018	0.5952	0.0000
Ta-186	10.500 m	2.86	4.8424E+18	1.4399E+05	1.5700	1.0570	0.0000
Ti-51	5.8000 m	0.52	2.3633E+18	1.2722E+05	0.3692	0.8684	0.0000
Al-29	6.5600 m	0.91	2.1475E+18	1.0221E+05	1.3790	0.9765	0.0000
Co-62	1.5000 m	2.67	4.2456E+17	8.8374E+04	1.5990	1.6430	0.0000
Hf-183	1.0670 h	1.59	1.6511E+19	8.0523E+04	0.7528	0.4179	0.0000
V-54	49.800 s	1.00	1.3780E+17	5.1839E+04	4.1000	1.4680	0.0000
N-16	7.1300 s	0.28	1.6955E+16	4.4547E+04	4.6030	2.6930	0.0000
Mn-58	2.7000 s	22.22	6.1299E+15	4.2532E+04	0.0569	2.8120	0.0000
Co-61	1.6500 h	0.30	1.0392E+19	3.2774E+04	0.0970	0.4590	0.0000
W-185	75.100 d	0.40	8.5341E+21	2.4639E+04	0.0001	0.1269	0.0000
Al-30	3.6500 s	1.64	4.7258E+15	2.4255E+04	3.4820	2.2990	0.0000
Mn-58m	1.0870 m	0.77	6.8806E+16	1.9764E+04	2.3780	1.7530	0.0000
P-34	12.400 s	0.81	8.7126E+15	1.3163E+04	0.3344	2.3020	0.0000
Hf-180m	5.5000 h	1.82	1.2846E+19	1.2154E+04	0.9980	0.0000	0.0000
Co-58	70.860 d	0.10	3.5748E+21	1.0938E+04	0.9770	0.0036	0.0300
Fe-61	5.9800 m	1.00	1.9801E+17	1.0338E+04	1.3970	1.1990	0.0000
Co-62m	13.910 m	0.36	4.5418E+17	1.0195E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800 m	1.16	7.0288E+16	8506.	3.0540	0.0000	0.0000
Mg-27	9.4580 m	0.13	2.4524E+17	8096.	0.8914	0.7010	0.0000
Fe-55	2.7351 y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490 d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000 h	1.15	4.8639E+18	2909.	1.5620	0.4113	0.0000
Fe-53	8.5100 m	0.82	7.5617E+16	2774.	1.2070	0.0000	1.1050
Mn-54	312.20 d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900 d	1.38	3.8639E+19	1646.	0.2936	0.1877	0.0000
Hf-182m	1.0250 h	2.44	2.7399E+17	1391.	0.9860	0.0888	0.0000
W-179m	6.4000 m	1.09	1.9963E+16	973.9	0.0552	0.0000	0.0000
Ta-185	49.000 m	4.08	1.3628E+17	868.4	0.1450	0.6334	0.0000
P-32	14.270 d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
C-15	2.4490 s	0.20	1.0015E+14	766.1	3.3580	2.9960	0.0000
O-19	26.910 s	0.30	9.5263E+14	663.2	0.9398	1.7770	0.0000
Co-63	27.400 s	1.83	8.9612E+14	612.7	0.1437	1.5310	0.0000
W-181	120.90 d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
P-30	2.4980 m	0.16	3.9360E+15	492.0	1.0300	0.0000	1.4350

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 4.07869E+10

Total number of decays = 2.97621E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 1.6949
Average chain length = 1.5377

Average gamma E (MeV) = 0.13338
Average beta E (MeV) = 6.76917E-03
Average alpha E (MeV) = 2.18439E-11

Composite Exposure Rate Conversion Factor = 1.94029927 R/hr per Ci/m2
Composite ECF per FGR table = 0.173989952 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.66725230 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 12.2717333 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	7.9162E+21	2.8248E+10	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.3542E+21	1.3774E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1366E+22	1.8414E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4757E+23	7.5835E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.3800E+20	3.8632E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.8703E+20	2.3930E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.3048E+20	1.8171E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.3385E+19	1.3431E+07	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.2729E+19	4.9871E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.7188E+19	3.3127E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5731E+21	2.0892E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.3534E+19	1.8947E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1541E+20	8.5782E+05	0.5583	0.6276	0.0000
Hf-178m	4.0000	s	7.50	1.6862E+17	7.8972E+05	1.0026	0.1430	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1916E+19	1.6270E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8294E+18	1.4361E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.3518E+18	1.2660E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	2.1383E+18	1.0177E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.1665E+17	8.6726E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6503E+19	8.0488E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.3319E+17	5.0104E+04	4.1000	1.4680	0.0000
N-16	7.1300	s	0.28	1.3367E+16	3.5121E+04	4.6030	2.6930	0.0000
Co-61	1.6500	h	0.30	1.0390E+19	3.2768E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	8.6598E+21	2.5002E+04	0.0001	0.1269	0.0000
Mn-58	2.7000	s	22.22	3.2717E+15	2.2700E+04	0.0569	2.8120	0.0000
Mn-58m	1.0870	m	0.77	6.7041E+16	1.9257E+04	2.3780	1.7530	0.0000
Al-30	3.6500	s	1.64	2.9701E+15	1.5244E+04	3.4820	2.2990	0.0000
Hf-180m	5.5000	h	1.82	1.2844E+19	1.2153E+04	0.9980	0.0000	0.0000
P-34	12.400	s	0.81	7.5993E+15	1.1481E+04	0.3344	2.3020	0.0000
Co-58	70.860	d	0.10	3.5749E+21	1.0939E+04	0.9770	0.0036	0.0000
Fe-61	5.9800	m	1.00	1.9707E+17	1.0290E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5326E+17	1.0174E+04	2.6830	1.0620	0.0000
Fe-53m	2.5800	m	1.16	6.9523E+16	8414.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4451E+17	8072.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8637E+18	2909.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.6131E+16	2793.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8646E+19	1646.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7387E+17	1390.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	1.9875E+16	969.6	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3621E+17	867.9	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
O-19	26.910	s	0.30	8.9447E+14	622.7	0.9398	1.7770	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
Co-63	27.400	s	1.83	8.4236E+14	575.9	0.1437	1.5310	0.0000
P-30	2.4980	m	0.16	3.8917E+15	486.4	1.0300	0.0000	1.4350
C-15	2.4490	s	0.20	5.0119E+13	383.4	3.3580	2.9960	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 2.99946E+10

Total number of decays = 3.29385E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 1.8757
Average chain length = 1.5377

Average gamma E (MeV) = 0.13550
Average beta E (MeV) = 9.16501E-03
Average alpha E (MeV) = 2.34180E-11

Composite Exposure Rate Conversion Factor = 2.00688195 R/hr per Ci/m2
Composite ECF per FGR table = 0.234996334 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.69370174 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 15.3261919 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	5.2891E+21	1.8873E+10	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	7.2002E+21	1.3486E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1346E+22	1.8410E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4756E+23	7.5833E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.3366E+20	3.8249E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.8433E+20	2.3706E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.2845E+20	1.7888E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	1.1950E+19	1.1991E+07	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.2172E+19	4.8649E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.6818E+19	3.2413E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5728E+21	2.0890E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.3320E+19	1.8883E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1531E+20	8.5762E+05	0.5583	0.6276	0.0000
Hf-178m	4.0000	s	7.50	9.9320E+16	4.6516E+05	1.0026	0.1430	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1898E+19	1.6266E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.8132E+18	1.4312E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.3375E+18	1.2584E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	2.1268E+18	1.0123E+05	1.3790	0.9765	0.0000
Co-62	1.5000	m	2.67	4.0697E+17	8.4712E+04	1.5990	1.6430	0.0000
Hf-183	1.0670	h	1.59	1.6494E+19	8.0444E+04	0.7528	0.4179	0.0000
V-54	49.800	s	1.00	1.2765E+17	4.8018E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0387E+19	3.2760E+04	0.0970	0.4590	0.0000
N-16	7.1300	s	0.28	9.9327E+15	2.6098E+04	4.6030	2.6930	0.0000
W-185	75.100	d	0.40	8.8138E+21	2.5447E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	6.4899E+16	1.8642E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2843E+19	1.2151E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5752E+21	1.0940E+04	0.9770	0.0036	0.0300
Mn-58	2.7000	s	22.22	1.4936E+15	1.0363E+04	0.0569	2.8120	0.0000
Fe-61	5.9800	m	1.00	1.9591E+17	1.0229E+04	1.3970	1.1990	0.0000
Co-62m	13.910	m	0.36	4.5211E+17	1.0148E+04	2.6830	1.0620	0.0000
P-34	12.400	s	0.81	6.4065E+15	9679.	0.3344	2.3020	0.0000
Al-30	3.6500	s	1.64	1.6629E+15	8535.	3.4820	2.2990	0.0000
Fe-53m	2.5800	m	1.16	6.8578E+16	8299.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4360E+17	8042.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8634E+18	2909.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.6758E+16	2816.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8655E+19	1647.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7371E+17	1390.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	1.9766E+16	964.3	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3611E+17	867.3	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2650E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
O-19	26.910	s	0.30	8.2679E+14	575.6	0.9398	1.7770	0.0000
Co-63	27.400	s	1.83	7.7972E+14	533.1	0.1437	1.5310	0.0000
P-30	2.4980	m	0.16	3.8372E+15	479.6	1.0300	0.0000	1.4350
N-13	9.9670	m	0.04	1.1789E+16	369.3	1.0200	0.0000	0.4909

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 2.05882E+10

Total number of decays = 3.57613E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.0365
Average chain length = 1.5377

Average gamma E (MeV) = 0.13918
Average beta E (MeV) = 1.32848E-02
Average alpha E (MeV) = 2.53521E-11

Composite Exposure Rate Conversion Factor = 2.12141180 R/hr per Ci/m2
Composite ECF per FGR table = 0.340007633 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.73972440 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 19.1409130 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	3.1963E+21	1.1405E+10	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	7.0123E+21	1.3134E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1320E+22	1.8405E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4755E+23	7.5831E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.2829E+20	3.7776E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.8101E+20	2.3428E+07	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420	m	0.13	1.2595E+20	1.7540E+07	1.7790	1.2470	0.0000	0.0000
Hf-179m	18.670	s	0.21	1.0372E+19	1.0407E+07	0.2370	0.0000	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.1496E+19	4.7166E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.6366E+19	3.1544E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5725E+21	2.0888E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.3054E+19	1.8804E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1519E+20	8.5737E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Hf-178m	4.0000	s	7.50	5.1280E+16	2.4017E+05	1.0026	0.1430	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1875E+19	1.6262E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.7930E+18	1.4252E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.3198E+18	1.2488E+05	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	2.1126E+18	1.0055E+05	1.3790	0.9765	0.0000	0.0000
Co-62	1.5000	m	2.67	3.9520E+17	8.2263E+04	1.5990	1.6430	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6483E+19	8.0388E+04	0.7528	0.4179	0.0000	0.0000
V-54	49.800	s	1.00	1.2105E+17	4.5535E+04	4.1000	1.4680	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0384E+19	3.2750E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	9.0017E+21	2.5989E+04	0.0001	0.1269	0.0000	0.0000
N-16	7.1300	s	0.28	6.8550E+15	1.8011E+04	4.6030	2.6930	0.0000	0.0000
Mn-58m	1.0870	m	0.77	6.2321E+16	1.7901E+04	2.3780	1.7530	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2841E+19	1.2150E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5755E+21	1.0941E+04	0.9770	0.0036	0.0300	0.0000
Fe-61	5.9800	m	1.00	1.9447E+17	1.0154E+04	1.3970	1.1990	0.0000	0.0000
Co-62m	13.910	m	0.36	4.5068E+17	1.0116E+04	2.6830	1.0620	0.0000	0.0000
Fe-53m	2.5800	m	1.16	6.7417E+16	8159.	3.0540	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4246E+17	8004.	0.8914	0.7010	0.0000	0.0000
P-34	12.400	s	0.81	5.1762E+15	7820.	0.3344	2.3020	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Al-30	3.6500	s	1.64	8.0583E+14	4136.	3.4820	2.2990	0.0000	0.0000
Mn-58	2.7000	s	22.22	5.6093E+14	3892.	0.0569	2.8120	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8629E+18	2909.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.7520E+16	2844.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8666E+19	1647.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7351E+17	1389.	0.9860	0.0888	0.0000	0.0000
W-179m	6.4000	m	1.09	1.9630E+16	957.7	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3598E+17	866.5	0.1450	0.6334	0.0000	0.0000
P-32	14.270	d	0.28	5.2649E+19	800.0	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000	0.0000
O-19	26.910	s	0.30	7.4942E+14	521.7	0.9398	1.7770	0.0000	0.0000
Co-63	27.400	s	1.83	7.0799E+14	484.1	0.1437	1.5310	0.0000	0.0000
P-30	2.4980	m	0.16	3.7701E+15	471.2	1.0300	0.0000	1.4350	0.0000
N-13	9.9670	m	0.04	1.1737E+16	367.7	1.0200	0.0000	0.4909	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 141
Total activity (Ci) = 1.30821E+10

Total number of decays = 3.80934E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.1693
Average chain length = 1.5377

Average gamma E (MeV) = 0.14598
Average beta E (MeV) = 2.07815E-02
Average alpha E (MeV) = 2.75358E-11

Composite Exposure Rate Conversion Factor = 2.32992196 R/hr per Ci/m2
Composite ECF per FGR table = 0.531362891 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.82472026 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 23.9051113 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-183m	5.2500	s	1.33	1.7040E+21	6.0805E+09	0.1276	0.0000	0.0000
W-185m	1.6670	m	2.00	6.7846E+21	1.2707E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1287E+22	1.8398E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4753E+23	7.5828E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.2169E+20	3.7193E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.7691E+20	2.3086E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.2289E+20	1.7114E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	8.6906E+18	8.7202E+06	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	2.0681E+19	4.5376E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.5820E+19	3.0490E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5722E+21	2.0886E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.2724E+19	1.8705E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1504E+20	8.5706E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1846E+19	1.6256E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.7679E+18	1.4178E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.2979E+18	1.2370E+05	0.3692	0.8684	0.0000
Hf-178m	4.0000	s	7.50	2.2460E+16	1.0519E+05	1.0026	0.1430	0.0000
Al-29	6.5600	m	0.91	2.0949E+18	9.9710E+04	1.3790	0.9765	0.0000
Hf-183	1.0670	h	1.59	1.6469E+19	8.0319E+04	0.7528	0.4179	0.0000
Co-62	1.5000	m	2.67	3.8098E+17	7.9303E+04	1.5990	1.6430	0.0000
V-54	49.800	s	1.00	1.1328E+17	4.2614E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0380E+19	3.2737E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	9.2294E+21	2.6647E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	5.9244E+16	1.7017E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2839E+19	1.2148E+04	0.9980	0.0000	0.0000
N-16	7.1300	s	0.28	4.3138E+15	1.1334E+04	4.6030	2.6930	0.0000
Co-58	70.860	d	0.10	3.5758E+21	1.0942E+04	0.9770	0.0036	0.0300
Co-62m	13.910	m	0.36	4.4890E+17	1.0076E+04	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.9269E+17	1.0061E+04	1.3970	1.1990	0.0000
Fe-53m	2.5800	m	1.16	6.5994E+16	7987.	3.0540	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.4106E+17	7958.	0.8914	0.7010	0.0000
P-34	12.400	s	0.81	3.9660E+15	5992.	0.3344	2.3020	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.8624E+18	2908.	1.5620	0.4113	0.0000
Fe-53	8.5100	m	0.82	7.8439E+16	2878.	1.2070	0.0000	1.1050
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Al-30	3.6500	s	1.64	3.2608E+14	1674.	3.4820	2.2990	0.0000
Ta-183	5.0900	d	1.38	3.8680E+19	1648.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7327E+17	1387.	0.9860	0.0888	0.0000
Mn-58	2.7000	s	22.22	1.6510E+14	1146.	0.0569	2.8120	0.0000
W-179m	6.4000	m	1.09	1.9462E+16	949.5	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3583E+17	865.5	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2649E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
O-19	26.910	s	0.30	6.6287E+14	461.5	0.9398	1.7770	0.0000
P-30	2.4980	m	0.16	3.6879E+15	461.0	1.0300	0.0000	1.4350
Co-63	27.400	s	1.83	6.2761E+14	429.1	0.1437	1.5310	0.0000
N-13	9.9670	m	0.04	1.1672E+16	365.6	1.0200	0.0000	0.4909

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 7.71089E+09

Total number of decays = 3.98772E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.2709
Average chain length = 1.5377

Average gamma E (MeV) = 0.15912
Average beta E (MeV) = 3.50027E-02
Average alpha E (MeV) = 2.93984E-11

Composite Exposure Rate Conversion Factor = 2.72572637 R/hr per Ci/m2
Composite ECF per FGR table = 0.895089805 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.98901236 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 29.8551559 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)				
					gamma	beta(-)	beta(+)	alpha	
W-183m	5.2500	s	1.33	7.7679E+20	2.7718E+09	0.1276	0.0000	0.0000	0.0000
W-185m	1.6670	m	2.00	6.5105E+21	1.2194E+09	0.0274	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1247E+22	1.8390E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4752E+23	7.5824E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400	m	0.85	4.1358E+20	3.6478E+07	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	2.7187E+20	2.2667E+07	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420	m	0.13	1.1918E+20	1.6597E+07	1.7790	1.2470	0.0000	0.0000
Hf-179m	18.670	s	0.21	6.9681E+18	6.9918E+06	0.2370	0.0000	0.0000	0.0000
Mn-57	1.4230	m	2.11	1.9705E+19	4.3237E+06	0.0976	1.0900	0.0000	0.0000
V-53	1.6200	m	2.47	1.5163E+19	2.9223E+06	1.0380	1.0090	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5717E+21	2.0884E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470	m	0.38	6.2313E+19	1.8583E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1485E+20	8.5667E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1810E+19	1.6249E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	4.7368E+18	1.4085E+05	1.5700	1.0570	0.0000	0.0000
Ti-51	5.8000	m	0.52	2.2709E+18	1.2225E+05	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	2.0731E+18	9.8670E+04	1.3790	0.9765	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.6451E+19	8.0233E+04	0.7528	0.4179	0.0000	0.0000
Co-62	1.5000	m	2.67	3.6394E+17	7.5755E+04	1.5990	1.6430	0.0000	0.0000
V-54	49.800	s	1.00	1.0428E+17	3.9227E+04	4.1000	1.4680	0.0000	0.0000
Hf-178m	4.0000	s	7.50	8.0099E+15	3.7514E+04	1.0026	0.1430	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0375E+19	3.2721E+04	0.0970	0.4590	0.0000	0.0000
W-185	75.100	d	0.40	9.5035E+21	2.7438E+04	0.0001	0.1269	0.0000	0.0000
Mn-58m	1.0870	m	0.77	5.5613E+16	1.5974E+04	2.3780	1.7530	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2837E+19	1.2145E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.5763E+21	1.0943E+04	0.9770	0.0036	0.0300	0.0000
Co-62m	13.910	m	0.36	4.4669E+17	1.0026E+04	2.6830	1.0620	0.0000	0.0000
Fe-61	5.9800	m	1.00	1.9049E+17	9946.	1.3970	1.1990	0.0000	0.0000
Mg-27	9.4580	m	0.13	2.3931E+17	7900.	0.8914	0.7010	0.0000	0.0000
Fe-53m	2.5800	m	1.16	6.4259E+16	7777.	3.0540	0.0000	0.0000	0.0000
N-16	7.1300	s	0.28	2.4191E+15	6356.	4.6030	2.6930	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
P-34	12.400	s	0.81	2.8439E+15	4296.	0.3344	2.3020	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7330E+20	3769.	1.1880	0.1176	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.9536E+16	2918.	1.2070	0.0000	1.1050	0.0000
Ta-184	8.7000	h	1.15	4.8618E+18	2908.	1.5620	0.4113	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.8697E+19	1648.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.7296E+17	1386.	0.9860	0.0888	0.0000	0.0000
W-179m	6.4000	m	1.09	1.9254E+16	939.3	0.0552	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3564E+17	864.3	0.1450	0.6334	0.0000	0.0000
P-32	14.270	d	0.28	5.2649E+19	800.0	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000	0.0000
Al-30	3.6500	s	1.64	1.0534E+14	540.7	3.4820	2.2990	0.0000	0.0000
P-30	2.4980	m	0.16	3.5878E+15	448.4	1.0300	0.0000	1.4350	0.0000
O-19	26.910	s	0.30	5.6868E+14	395.9	0.9398	1.7770	0.0000	0.0000
Co-63	27.400	s	1.83	5.3990E+14	369.1	0.1437	1.5310	0.0000	0.0000
N-13	9.9670	m	0.04	1.1592E+16	363.1	1.0200	0.0000	0.4909	0.0000
Cr-49	41.900	m	0.72	4.3977E+16	327.7	1.0600	0.0000	0.5970	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
 Total activity (Ci) = 4.34702E+09

Total number of decays = 4.11572E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.3438
 Average chain length = 1.5377

Average gamma E (MeV) = 0.18427
 Average beta E (MeV) = 6.15463E-02
 Average alpha E (MeV) = 2.92432E-11

Composite Exposure Rate Conversion Factor = 3.46521854 R/hr per Ci/m2
 Composite ECF per FGR table = 1.57613921 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 2.30336952 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 37.2861481 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	6.1837E+21	1.1582E+09	0.0274	0.0000	0.0000
W-183m	5.2500	s	1.33	2.9122E+20	1.0392E+09	0.1276	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1196E+22	1.8380E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4750E+23	7.5820E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	4.0367E+20	3.5604E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.6571E+20	2.2153E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.1470E+20	1.5974E+07	1.7790	1.2470	0.0000
Hf-179m	18.670	s	0.21	5.2881E+18	5.3061E+06	0.2370	0.0000	0.0000
Mn-57	1.4230	m	2.11	1.8552E+19	4.0705E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	1.4380E+19	2.7715E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5711E+21	2.0880E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.1804E+19	1.8431E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1462E+20	8.5619E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2700E+22	3.3412E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1766E+19	1.6240E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.6983E+18	1.3971E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.2375E+18	1.2045E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	2.0461E+18	9.7388E+04	1.3790	0.9765	0.0000
Hf-183	1.0670	h	1.59	1.6429E+19	8.0125E+04	0.7528	0.4179	0.0000
Co-62	1.5000	m	2.67	3.4372E+17	7.1547E+04	1.5990	1.6430	0.0000
V-54	49.800	s	1.00	9.4031E+16	3.5372E+04	4.1000	1.4680	0.0000
Co-61	1.6500	h	0.30	1.0369E+19	3.2701E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	9.8302E+21	2.8381E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870	m	0.77	5.1390E+16	1.4761E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000	h	1.82	1.2833E+19	1.2142E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5769E+21	1.0945E+04	0.9770	0.0036	0.0300
Hf-178m	4.0000	s	7.50	2.2100E+15	1.0350E+04	1.0026	0.1430	0.0000
Co-62m	13.910	m	0.36	4.4394E+17	9965.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.8778E+17	9804.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	2.3715E+17	7829.	0.8914	0.7010	0.0000
Fe-53m	2.5800	m	1.16	6.2156E+16	7522.	3.0540	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7329E+20	3769.	1.1880	0.1176	0.0000
N-16	7.1300	s	0.28	1.1747E+15	3086.	4.6030	2.6930	0.0000
Fe-53	8.5100	m	0.82	8.0830E+16	2966.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8610E+18	2908.	1.5620	0.4113	0.0000
P-34	12.400	s	0.81	1.8772E+15	2836.	0.3344	2.3020	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8719E+19	1649.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7258E+17	1384.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	1.8997E+16	926.8	0.0552	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3540E+17	862.8	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2649E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
P-30	2.4980	m	0.16	3.4666E+15	433.3	1.0300	0.0000	1.4350
N-13	9.9670	m	0.04	1.1492E+16	360.0	1.0200	0.0000	0.4909
Cr-49	41.900	m	0.72	4.3887E+16	327.0	1.0600	0.0000	0.5970
O-19	26.910	s	0.30	4.6961E+14	326.9	0.9398	1.7770	0.0000
Co-63	27.400	s	1.83	4.4738E+14	305.9	0.1437	1.5310	0.0000
S-37	4.9900	m	0.40	3.8572E+15	241.4	2.9310	0.7998	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 2.54887E+09

Total number of decays = 4.20668E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.3956
Average chain length = 1.5377

Average gamma E (MeV) = 0.22581
Average beta E (MeV) = 0.10385
Average alpha E (MeV) = 2.42176E-11

Composite Exposure Rate Conversion Factor = 4.64575911 R/hr per Ci/m2
Composite ECF per FGR table = 2.66771650 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.82267857 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 46.5667229 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
W-185m	1.6670 m	2.00	5.7985E+21	1.0861E+09	0.0274	0.0000	0.0000
W-183m	5.2500 s	1.33	8.5522E+19	3.0517E+08	0.1276	0.0000	0.0000
Mn-56	2.5820 h	0.19	9.1133E+22	1.8367E+08	1.6910	0.8309	0.0000
W-187	23.850 h	0.34	3.4747E+23	7.5814E+07	0.4476	0.2710	0.0000
Cr-55	3.5400 m	0.85	3.9163E+20	3.4541E+07	0.0033	1.1010	0.0000
V-52	3.7450 m	0.13	2.5821E+20	2.1528E+07	1.4450	1.0680	0.0000
Al-28	2.2420 m	0.13	1.0935E+20	1.5228E+07	1.7790	1.2470	0.0000
Mn-57	1.4230 m	2.11	1.7205E+19	3.7751E+06	0.0976	1.0900	0.0000
Hf-179m	18.670 s	0.21	3.7468E+18	3.7596E+06	0.2370	0.0000	0.0000
V-53	1.6200 m	2.47	1.3459E+19	2.5940E+06	1.0380	1.0090	0.0000
Co-58m	8.9000 h	1.12	3.5704E+21	2.0876E+06	0.0019	0.0208	0.0000
Co-60m	10.470 m	0.38	6.1175E+19	1.8243E+06	0.0066	0.0536	0.0000
Ni-65	2.5200 h	0.04	4.1432E+20	8.5558E+05	0.5583	0.6276	0.0000
Cr-51	27.710 d	0.01	4.2699E+22	3.3411E+05	0.0328	0.0031	0.0000
Si-31	2.6200 h	0.38	8.1710E+19	1.6229E+05	0.0018	0.5952	0.0000
Ta-186	10.500 m	2.86	4.6505E+18	1.3829E+05	1.5700	1.0570	0.0000
Ti-51	5.8000 m	0.52	2.1965E+18	1.1824E+05	0.3692	0.8684	0.0000
Al-29	6.5600 m	0.91	2.0130E+18	9.5809E+04	1.3790	0.9765	0.0000
Hf-183	1.0670 h	1.59	1.6402E+19	7.9991E+04	0.7528	0.4179	0.0000
Co-62	1.5000 m	2.67	3.2005E+17	6.6618E+04	1.5990	1.6430	0.0000
Co-61	1.6500 h	0.30	1.0361E+19	3.2677E+04	0.0970	0.4590	0.0000
V-54	49.800 s	1.00	8.2636E+16	3.1086E+04	4.1000	1.4680	0.0000
W-185	75.100 d	0.40	1.0215E+22	2.9494E+04	0.0001	0.1269	0.0000
Mn-58m	1.0870 m	0.77	4.6564E+16	1.3375E+04	2.3780	1.7530	0.0000
Hf-180m	5.5000 h	1.82	1.2829E+19	1.2138E+04	0.9980	0.0000	0.0000
Co-58	70.860 d	0.10	3.5776E+21	1.0947E+04	0.9770	0.0036	0.0300
Co-62m	13.910 m	0.36	4.4053E+17	9888.	2.6830	1.0620	0.0000
Fe-61	5.9800 m	1.00	1.8444E+17	9630.	1.3970	1.1990	0.0000
Mg-27	9.4580 m	0.13	2.3448E+17	7741.	0.8914	0.7010	0.0000
Fe-53m	2.5800 m	1.16	5.9626E+16	7216.	3.0540	0.0000	0.0000
Fe-55	2.7351 y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490 d	0.02	7.7329E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100 m	0.82	8.2332E+16	3021.	1.2070	0.0000	1.1050
Ta-184	8.7000 h	1.15	4.8600E+18	2907.	1.5620	0.4113	0.0000
Hf-178m	4.0000 s	7.50	4.4254E+14	2073.	1.0026	0.1430	0.0000
Mn-54	312.20 d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
P-34	12.400 s	0.81	1.1174E+15	1688.	0.3344	2.3020	0.0000
Ta-183	5.0900 d	1.38	3.8746E+19	1650.	0.2936	0.1877	0.0000
Hf-182m	1.0250 h	2.44	2.7211E+17	1381.	0.9860	0.0888	0.0000
N-16	7.1300 s	0.28	4.7653E+14	1252.	4.6030	2.6930	0.0000
W-179m	6.4000 m	1.09	1.8682E+16	911.4	0.0552	0.0000	0.0000
Ta-185	49.000 m	4.08	1.3511E+17	860.9	0.1450	0.6334	0.0000
P-32	14.270 d	0.28	5.2649E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90 d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
P-30	2.4980 m	0.16	3.3210E+15	415.1	1.0300	0.0000	1.4350
N-13	9.9670 m	0.04	1.1369E+16	356.2	1.0200	0.0000	0.4909
Cr-49	41.900 m	0.72	4.3774E+16	326.2	1.0600	0.0000	0.5970
O-19	26.910 s	0.30	3.6976E+14	257.4	0.9398	1.7770	0.0000
Co-63	27.400 s	1.83	3.5377E+14	241.9	0.1437	1.5310	0.0000
S-37	4.9900 m	0.40	3.7753E+15	236.2	2.9310	0.7998	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
Total activity (Ci) = 1.73810E+09

Total number of decays = 4.27775E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.4360
Average chain length = 1.5377

Average gamma E (MeV) = 0.27435
Average beta E (MeV) = 0.15033
Average alpha E (MeV) = 1.44071E-11

Composite Exposure Rate Conversion Factor = 5.94724274 R/hr per Ci/m2
Composite ECF per FGR table = 3.88148093 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.42939520 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 58.1572990 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	5.3510E+21	1.0022E+09	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.1054E+22	1.8351E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4744E+23	7.5807E+07	0.4476	0.2710	0.0000
W-183m	5.2500	s	1.33	1.8513E+19	6.6062E+07	0.1276	0.0000	0.0000
Cr-55	3.5400	m	0.85	3.7709E+20	3.3259E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.4914E+20	2.0772E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	1.0301E+20	1.4345E+07	1.7790	1.2470	0.0000
Mn-57	1.4230	m	2.11	1.5660E+19	3.4361E+06	0.0976	1.0900	0.0000
Hf-179m	18.670	s	0.21	2.4366E+18	2.4449E+06	0.2370	0.0000	0.0000
V-53	1.6200	m	2.47	1.2391E+19	2.3882E+06	1.0380	1.0090	0.0000
Co-58m	8.9000	h	1.12	3.5695E+21	2.0871E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	6.0397E+19	1.8011E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.1396E+20	8.5482E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2699E+22	3.3411E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1640E+19	1.6215E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.5916E+18	1.3654E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.1464E+18	1.1555E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	1.9723E+18	9.3873E+04	1.3790	0.9765	0.0000
Hf-183	1.0670	h	1.59	1.6367E+19	7.9824E+04	0.7528	0.4179	0.0000
Co-62	1.5000	m	2.67	2.9276E+17	6.0938E+04	1.5990	1.6430	0.0000
Co-61	1.6500	h	0.30	1.0351E+19	3.2645E+04	0.0970	0.4590	0.0000
W-185	75.100	d	0.40	1.0663E+22	3.0786E+04	0.0001	0.1269	0.0000
V-54	49.800	s	1.00	7.0325E+16	2.6455E+04	4.1000	1.4680	0.0000
Hf-180m	5.5000	h	1.82	1.2824E+19	1.2133E+04	0.9980	0.0000	0.0000
Mn-58m	1.0870	m	0.77	4.1167E+16	1.1825E+04	2.3780	1.7530	0.0000
Co-58	70.860	d	0.10	3.5785E+21	1.0950E+04	0.9770	0.0036	0.0300
Co-62m	13.910	m	0.36	4.3631E+17	9794.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.8035E+17	9417.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	2.3118E+17	7632.	0.8914	0.7010	0.0000
Fe-53m	2.5800	m	1.16	5.6610E+16	6851.	3.0540	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7329E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	8.4038E+16	3083.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8587E+18	2906.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8779E+19	1652.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.7152E+17	1378.	0.9860	0.0888	0.0000
W-179m	6.4000	m	1.09	1.8295E+16	892.5	0.0552	0.0000	0.0000
P-34	12.400	s	0.81	5.8456E+14	883.1	0.3344	2.3020	0.0000
Ta-185	49.000	m	4.08	1.3474E+17	858.6	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2648E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
N-16	7.1300	s	0.28	1.5443E+14	405.8	4.6030	2.6930	0.0000
P-30	2.4980	m	0.16	3.1476E+15	393.4	1.0300	0.0000	1.4350
N-13	9.9670	m	0.04	1.1218E+16	351.4	1.0200	0.0000	0.4909
Cr-49	41.900	m	0.72	4.3635E+16	325.2	1.0600	0.0000	0.5970
Hf-178m	4.0000	s	7.50	5.9385E+13	278.1	1.0026	0.1430	0.0000
S-37	4.9900	m	0.40	3.6753E+15	230.0	2.9310	0.7998	0.0000
O-19	26.910	s	0.30	2.7432E+14	191.0	0.9398	1.7770	0.0000
W-179	37.050	m	0.43	2.1956E+16	185.0	0.0005	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 141
Total activity (Ci) = 1.41018E+09

Total number of decays = 4.34397E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.4737
Average chain length = 1.5377

Average gamma E (MeV) = 0.31237
Average beta E (MeV) = 0.18241
Average alpha E (MeV) = 5.75468E-12

Composite Exposure Rate Conversion Factor = 6.85332489 R/hr per Ci/m2
Composite ECF per FGR table = 4.74561214 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.90464115 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.21054566 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
W-185m	1.6670 m	2.00	4.8402E+21	9.0658E+08	0.0274	0.0000	0.0000
Mn-56	2.5820 h	0.19	9.0956E+22	1.8331E+08	1.6910	0.8309	0.0000
W-187	23.850 h	0.34	3.4740E+23	7.5798E+07	0.4476	0.2710	0.0000
Cr-55	3.5400 m	0.85	3.5969E+20	3.1725E+07	0.0033	1.1010	0.0000
V-52	3.7450 m	0.13	2.3826E+20	1.9864E+07	1.4450	1.0680	0.0000
Al-28	2.2420 m	0.13	9.5604E+19	1.3314E+07	1.7790	1.2470	0.0000
W-183m	5.2500 s	1.33	2.7383E+18	9.7711E+06	0.1276	0.0000	0.0000
Mn-57	1.4230 m	2.11	1.3924E+19	3.0551E+06	0.0976	1.0900	0.0000
V-53	1.6200 m	2.47	1.1176E+19	2.1540E+06	1.0380	1.0090	0.0000
Co-58m	8.9000 h	1.12	3.5684E+21	2.0864E+06	0.0019	0.0208	0.0000
Co-60m	10.470 m	0.38	5.9440E+19	1.7726E+06	0.0066	0.0536	0.0000
Hf-179m	18.670 s	0.21	1.4236E+18	1.4284E+06	0.2370	0.0000	0.0000
Ni-65	2.5200 h	0.04	4.1350E+20	8.5388E+05	0.5583	0.6276	0.0000
Cr-51	27.710 d	0.01	4.2699E+22	3.3411E+05	0.0328	0.0031	0.0000
Si-31	2.6200 h	0.38	8.1554E+19	1.6198E+05	0.0018	0.5952	0.0000
Ta-186	10.500 m	2.86	4.5190E+18	1.3438E+05	1.5700	1.0570	0.0000
Ti-51	5.8000 m	0.52	2.0854E+18	1.1226E+05	0.3692	0.8684	0.0000
Al-29	6.5600 m	0.91	1.9227E+18	9.1510E+04	1.3790	0.9765	0.0000
Hf-183	1.0670 h	1.59	1.6325E+19	7.9616E+04	0.7528	0.4179	0.0000
Co-62	1.5000 m	2.67	2.6192E+17	5.4519E+04	1.5990	1.6430	0.0000
Co-61	1.6500 h	0.30	1.0339E+19	3.2606E+04	0.0970	0.4590	0.0000
W-185	75.100 d	0.40	1.1174E+22	3.2260E+04	0.0001	0.1269	0.0000
V-54	49.800 s	1.00	5.7492E+16	2.1627E+04	4.1000	1.4680	0.0000
Hf-180m	5.5000 h	1.82	1.2817E+19	1.2127E+04	0.9980	0.0000	0.0000
Co-58	70.860 d	0.10	3.5796E+21	1.0953E+04	0.9770	0.0036	0.0000
Mn-58m	1.0870 m	0.77	3.5297E+16	1.0139E+04	2.3780	1.7530	0.0000
Co-62m	13.910 m	0.36	4.3109E+17	9676.	2.6830	1.0620	0.0000
Fe-61	5.9800 m	1.00	1.7538E+17	9157.	1.3970	1.1990	0.0000
Mg-27	9.4580 m	0.13	2.2713E+17	7498.	0.8914	0.7010	0.0000
Fe-53m	2.5800 m	1.16	5.3058E+16	6421.	3.0540	0.0000	0.0000
Fe-55	2.7351 y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490 d	0.02	7.7329E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100 m	0.82	8.5921E+16	3152.	1.2070	0.0000	1.1050
Ta-184	8.7000 h	1.15	4.8572E+18	2905.	1.5620	0.4113	0.0000
Mn-54	312.20 d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900 d	1.38	3.8821E+19	1654.	0.2936	0.1877	0.0000
Hf-182m	1.0250 h	2.44	2.7078E+17	1375.	0.9860	0.0888	0.0000
W-179m	6.4000 m	1.09	1.7823E+16	869.5	0.0552	0.0000	0.0000
Ta-185	49.000 m	4.08	1.3428E+17	855.6	0.1450	0.6334	0.0000
P-32	14.270 d	0.28	5.2648E+19	800.0	0.0012	0.6949	0.0000
W-181	120.90 d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
P-34	12.400 s	0.81	2.6026E+14	393.2	0.3344	2.3020	0.0000
P-30	2.4980 m	0.16	2.9438E+15	368.0	1.0300	0.0000	1.4350
N-13	9.9670 m	0.04	1.1031E+16	345.6	1.0200	0.0000	0.4909
Cr-49	41.900 m	0.72	4.3461E+16	323.9	1.0600	0.0000	0.5970
S-37	4.9900 m	0.40	3.5542E+15	222.4	2.9310	0.7998	0.0000
W-179	37.050 m	0.43	2.2326E+16	188.1	0.0005	0.0000	0.0000
O-19	26.910 s	0.30	1.8894E+14	131.5	0.9398	1.7770	0.0000
Co-63	27.400 s	1.83	1.8295E+14	125.1	0.1437	1.5310	0.0000
N-16	7.1300 s	0.28	3.7807E+13	99.34	4.6030	2.6930	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 141
Total activity (Ci) = 1.25286E+09

Total number of decays = 4.41479E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.5141
Average chain length = 1.5377

Average gamma E (MeV) = 0.34053
Average beta E (MeV) = 0.20149
Average alpha E (MeV) = 1.58576E-12

Composite Exposure Rate Conversion Factor = 7.40369463 R/hr per Ci/m2
Composite ECF per FGR table = 5.29762220 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.25661850 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.51185203 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	4.2703E+21	7.9982E+08	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.0833E+22	1.8307E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4735E+23	7.5787E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	3.3908E+20	2.9907E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.2534E+20	1.8787E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	8.7101E+19	1.2130E+07	1.7790	1.2470	0.0000
Mn-57	1.4230	m	2.11	1.2023E+19	2.6381E+06	0.0976	1.0900	0.0000
Co-58m	8.9000	h	1.12	3.5670E+21	2.0856E+06	0.0019	0.0208	0.0000
V-53	1.6200	m	2.47	9.8242E+18	1.8935E+06	1.0380	1.0090	0.0000
Co-60m	10.470	m	0.38	5.8266E+19	1.7376E+06	0.0066	0.0536	0.0000
W-183m	5.2500	s	1.33	2.5171E+17	8.9820E+05	0.1276	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.1293E+20	8.5270E+05	0.5583	0.6276	0.0000
Hf-179m	18.670	s	0.21	7.2759E+17	7.3007E+05	0.2370	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2699E+22	3.3411E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.1445E+19	1.6177E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.4300E+18	1.3173E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	2.0116E+18	1.0829E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	1.8624E+18	8.8643E+04	1.3790	0.9765	0.0000
Hf-183	1.0670	h	1.59	1.6271E+19	7.9357E+04	0.7528	0.4179	0.0000
Co-62	1.5000	m	2.67	2.2794E+17	4.7446E+04	1.5990	1.6430	0.0000
W-185	75.100	d	0.40	1.1744E+22	3.3906E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0323E+19	3.2556E+04	0.0970	0.4590	0.0000
V-54	49.800	s	1.00	4.4702E+16	1.6816E+04	4.1000	1.4680	0.0000
Hf-180m	5.5000	h	1.82	1.2809E+19	1.2119E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5810E+21	1.0957E+04	0.9770	0.0036	0.0000
Co-62m	13.910	m	0.36	4.2467E+17	9532.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.6936E+17	8843.	1.3970	1.1990	0.0000
Mn-58m	1.0870	m	0.77	2.9127E+16	8366.	2.3780	1.7530	0.0000
Mg-27	9.4580	m	0.13	2.2217E+17	7334.	0.8914	0.7010	0.0000
Fe-53m	2.5800	m	1.16	4.8932E+16	5922.	3.0540	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7329E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	8.7913E+16	3225.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8552E+18	2904.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8873E+19	1656.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.6986E+17	1370.	0.9860	0.0888	0.0000
Ta-185	49.000	m	4.08	1.3371E+17	852.0	0.1450	0.6334	0.0000
W-179m	6.4000	m	1.09	1.7251E+16	841.6	0.0552	0.0000	0.0000
P-32	14.270	d	0.28	5.2647E+19	799.9	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
P-30	2.4980	m	0.16	2.7077E+15	338.4	1.0300	0.0000	1.4350
N-13	9.9670	m	0.04	1.0802E+16	338.4	1.0200	0.0000	0.4909
Cr-49	41.900	m	0.72	4.3245E+16	322.2	1.0600	0.0000	0.5970
S-37	4.9900	m	0.40	3.4085E+15	213.3	2.9310	0.7998	0.0000
W-179	37.050	m	0.43	2.2770E+16	191.9	0.0005	0.0000	0.0000
P-34	12.400	s	0.81	9.4739E+13	143.1	0.3344	2.3020	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8711E+17	85.15	1.9200	0.0044	0.1430
O-19	26.910	s	0.30	1.1860E+14	82.57	0.9398	1.7770	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 140
 Total activity (Ci) = 1.13146E+09

Total number of decays = 4.49435E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.5594
 Average chain length = 1.5377

Average gamma E (MeV) = 0.36940
 Average beta E (MeV) = 0.21817
 Average alpha E (MeV) = 3.02849E-13

Composite Exposure Rate Conversion Factor = 7.89663076 R/hr per Ci/m2
 Composite ECF per FGR table = 5.81666517 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 4.61746979 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.88815582 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	3.6518E+21	6.8397E+08	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.0681E+22	1.8276E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4728E+23	7.5773E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	3.1500E+20	2.7783E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	2.1018E+20	1.7523E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	7.7534E+19	1.0798E+07	1.7790	1.2470	0.0000
Mn-57	1.4230	m	2.11	1.0010E+19	2.1963E+06	0.0976	1.0900	0.0000
Co-58m	8.9000	h	1.12	3.5653E+21	2.0846E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	5.6833E+19	1.6948E+06	0.0066	0.0536	0.0000
V-53	1.6200	m	2.47	8.3632E+18	1.6119E+06	1.0380	1.0090	0.0000
Ni-65	2.5200	h	0.04	4.1222E+20	8.5123E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2699E+22	3.3411E+05	0.0328	0.0031	0.0000
Hf-179m	18.670	s	0.21	3.1466E+17	3.1573E+05	0.2370	0.0000	0.0000
Si-31	2.6200	h	0.38	8.1310E+19	1.6150E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.3214E+18	1.2850E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	1.9232E+18	1.0353E+05	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	1.7898E+18	8.5187E+04	1.3790	0.9765	0.0000
Hf-183	1.0670	h	1.59	1.6205E+19	7.9034E+04	0.7528	0.4179	0.0000
W-183m	5.2500	s	1.33	1.2788E+16	4.5632E+04	0.1276	0.0000	0.0000
Co-62	1.5000	m	2.67	1.9163E+17	3.9888E+04	1.5990	1.6430	0.0000
W-185	75.100	d	0.40	1.2362E+22	3.5691E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0303E+19	3.2493E+04	0.0970	0.4590	0.0000
V-54	49.800	s	1.00	3.2647E+16	1.2281E+04	4.1000	1.4680	0.0000
Hf-180m	5.5000	h	1.82	1.2799E+19	1.2110E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5827E+21	1.0963E+04	0.9770	0.0036	0.0000
Co-62m	13.910	m	0.36	4.1678E+17	9355.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.6213E+17	8465.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	2.1613E+17	7135.	0.8914	0.7010	0.0000
Mn-58m	1.0870	m	0.77	2.2913E+16	6581.	2.3780	1.7530	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-53m	2.5800	m	1.16	4.4227E+16	5352.	3.0540	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7328E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	8.9892E+16	3298.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8528E+18	2903.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.8938E+19	1659.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.6872E+17	1364.	0.9860	0.0888	0.0000
Ta-185	49.000	m	4.08	1.3300E+17	847.5	0.1450	0.6334	0.0000
W-179m	6.4000	m	1.09	1.6562E+16	808.0	0.0552	0.0000	0.0000
P-32	14.270	d	0.28	5.2647E+19	799.9	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
N-13	9.9670	m	0.04	1.0523E+16	329.7	1.0200	0.0000	0.4909
Cr-49	41.900	m	0.72	4.2976E+16	320.2	1.0600	0.0000	0.5970
P-30	2.4980	m	0.16	2.4392E+15	304.9	1.0300	0.0000	1.4350
S-37	4.9900	m	0.40	3.2349E+15	202.4	2.9310	0.7998	0.0000
W-179	37.050	m	0.43	2.3295E+16	196.3	0.0005	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8704E+17	85.14	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0960E+19	77.43	1.2910	0.2070	0.0000
Ta-182n	15.840	m	0.63	3.2171E+15	63.41	0.2667	0.5060	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
 Total activity (Ci) = 1.00851E+09

Total number of decays = 4.58358E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.6102
 Average chain length = 1.5377

Average gamma E (MeV) = 0.40600
 Average beta E (MeV) = 0.23840
 Average alpha E (MeV) = 3.78381E-14

Composite Exposure Rate Conversion Factor = 8.50370884 R/hr per Ci/m2
 Composite ECF per FGR table = 6.46875429 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.07504749 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.35812044 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
W-185m	1.6670 m	2.00	3.0036E+21	5.6257E+08	0.0274	0.0000	0.0000
Mn-56	2.5820 h	0.19	9.0490E+22	1.8238E+08	1.6910	0.8309	0.0000
W-187	23.850 h	0.34	3.4720E+23	7.5756E+07	0.4476	0.2710	0.0000
Cr-55	3.5400 m	0.85	2.8730E+20	2.5340E+07	0.0033	1.1010	0.0000
V-52	3.7450 m	0.13	1.9267E+20	1.6063E+07	1.4450	1.0680	0.0000
Al-28	2.2420 m	0.13	6.7049E+19	9.3375E+06	1.7790	1.2470	0.0000
Co-58m	8.9000 h	1.12	3.5631E+21	2.0833E+06	0.0019	0.0208	0.0000
Mn-57	1.4230 m	2.11	7.9615E+18	1.7469E+06	0.0976	1.0900	0.0000
Co-60m	10.470 m	0.38	5.5092E+19	1.6429E+06	0.0066	0.0536	0.0000
V-53	1.6200 m	2.47	6.8398E+18	1.3183E+06	1.0380	1.0090	0.0000
Ni-65	2.5200 h	0.04	4.1133E+20	8.4940E+05	0.5583	0.6276	0.0000
Cr-51	27.710 d	0.01	4.2698E+22	3.3411E+05	0.0328	0.0031	0.0000
Si-31	2.6200 h	0.38	8.1142E+19	1.6116E+05	0.0018	0.5952	0.0000
Ta-186	10.500 m	2.86	4.1893E+18	1.2457E+05	1.5700	1.0570	0.0000
Hf-179m	18.670 s	0.21	1.1046E+17	1.1083E+05	0.2370	0.0000	0.0000
Ti-51	5.8000 m	0.52	1.8181E+18	9.7875E+04	0.3692	0.8684	0.0000
Al-29	6.5600 m	0.91	1.7031E+18	8.1060E+04	1.3790	0.9765	0.0000
Hf-183	1.0670 h	1.59	1.6123E+19	7.8633E+04	0.7528	0.4179	0.0000
W-185	75.100 d	0.40	1.3010E+22	3.7563E+04	0.0001	0.1269	0.0000
Co-61	1.6500 h	0.30	1.0278E+19	3.2414E+04	0.0970	0.4590	0.0000
Co-62	1.5000 m	2.67	1.5431E+17	3.2120E+04	1.5990	1.6430	0.0000
Hf-180m	5.5000 h	1.82	1.2787E+19	1.2098E+04	0.9980	0.0000	0.0000
Co-58	70.860 d	0.10	3.5849E+21	1.0969E+04	0.9770	0.0036	0.0000
Co-62m	13.910 m	0.36	4.0713E+17	9139.	2.6830	1.0620	0.0000
V-54	49.800 s	1.00	2.2049E+16	8295.	4.1000	1.4680	0.0000
Fe-61	5.9800 m	1.00	1.5354E+17	8017.	1.3970	1.1990	0.0000
Mg-27	9.4580 m	0.13	2.0881E+17	6893.	0.8914	0.7010	0.0000
Fe-55	2.7351 y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Mn-58m	1.0870 m	0.77	1.6980E+16	4877.	2.3780	1.7530	0.0000
Fe-53m	2.5800 m	1.16	3.8981E+16	4717.	3.0540	0.0000	0.0000
Fe-59	44.490 d	0.02	7.7328E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100 m	0.82	9.1661E+16	3363.	1.2070	0.0000	1.1050
Ta-184	8.7000 h	1.15	4.8498E+18	2901.	1.5620	0.4113	0.0000
Mn-54	312.20 d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900 d	1.38	3.9018E+19	1662.	0.2936	0.1877	0.0000
Hf-182m	1.0250 h	2.44	2.6730E+17	1357.	0.9860	0.0888	0.0000
W-183m	5.2500 s	1.33	3.2445E+14	1158.	0.1276	0.0000	0.0000
Ta-185	49.000 m	4.08	1.3212E+17	841.9	0.1450	0.6334	0.0000
P-32	14.270 d	0.28	5.2646E+19	799.9	0.0012	0.6949	0.0000
W-179m	6.4000 m	1.09	1.5740E+16	767.9	0.0552	0.0000	0.0000
W-181	120.90 d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
N-13	9.9670 m	0.04	1.0185E+16	319.1	1.0200	0.0000	0.4909
Cr-49	41.900 m	0.72	4.2644E+16	317.8	1.0600	0.0000	0.5970
P-30	2.4980 m	0.16	2.1410E+15	267.6	1.0300	0.0000	1.4350
W-179	37.050 m	0.43	2.3907E+16	201.5	0.0005	0.0000	0.0000
S-37	4.9900 m	0.40	3.0305E+15	189.6	2.9310	0.7998	0.0000
Ni-63	100.60 y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950 d	0.84	5.8695E+17	85.13	1.9200	0.0044	0.1430
Ta-182n	15.840 m	0.63	3.9666E+15	78.19	0.2667	0.5060	0.0000
Ta-182m	0.28300 s	1.06	1.1779E+12	77.98	0.0017	0.0122	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 141
 Total activity (Ci) = 8.80261E+08

Total number of decays = 4.68190E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.6662
 Average chain length = 1.5377

Average gamma E (MeV) = 0.45475
 Average beta E (MeV) = 0.26494
 Average alpha E (MeV) = 2.79562E-15

Composite Exposure Rate Conversion Factor = 9.30983829 R/hr per Ci/m2
 Composite ECF per FGR table = 7.34270573 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.68443441 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.94506025 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	2.3531E+21	4.4074E+08	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	9.0253E+22	1.8190E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4710E+23	7.5734E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	2.5611E+20	2.2589E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.7284E+20	1.4410E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	5.5922E+19	7.7879E+06	1.7790	1.2470	0.0000
Co-58m	8.9000	h	1.12	3.5604E+21	2.0817E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	5.2992E+19	1.5803E+06	0.0066	0.0536	0.0000
Mn-57	1.4230	m	2.11	5.9818E+18	1.3125E+06	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	5.3208E+18	1.0255E+06	1.0380	1.0090	0.0000
Ni-65	2.5200	h	0.04	4.1022E+20	8.4711E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2698E+22	3.3410E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.0932E+19	1.6075E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	4.0301E+18	1.1984E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	1.6950E+18	9.1245E+04	0.3692	0.8684	0.0000
Hf-183	1.0670	h	1.59	1.6021E+19	7.8135E+04	0.7528	0.4179	0.0000
Al-29	6.5600	m	0.91	1.6007E+18	7.6186E+04	1.3790	0.9765	0.0000
W-185	75.100	d	0.40	1.3661E+22	3.9440E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0245E+19	3.2312E+04	0.0970	0.4590	0.0000
Hf-179m	18.670	s	0.21	2.9879E+16	2.9981E+04	0.2370	0.0000	0.0000
Co-62	1.5000	m	2.67	1.1775E+17	2.4511E+04	1.5990	1.6430	0.0000
Hf-180m	5.5000	h	1.82	1.2771E+19	1.2083E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5876E+21	1.0978E+04	0.9770	0.0036	0.0000
Co-62m	13.910	m	0.36	3.9540E+17	8875.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.4344E+17	7489.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	2.0002E+17	6603.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
V-54	49.800	s	1.00	1.3506E+16	5081.	4.1000	1.4680	0.0000
Fe-53m	2.5800	m	1.16	3.3294E+16	4029.	3.0540	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7328E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	9.2931E+16	3410.	1.2070	0.0000	1.1050
Mn-58m	1.0870	m	0.77	1.1678E+16	3355.	2.3780	1.7530	0.0000
Ta-184	8.7000	h	1.15	4.8460E+18	2899.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.9118E+19	1666.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.6554E+17	1348.	0.9860	0.0888	0.0000
Ta-185	49.000	m	4.08	1.3103E+17	834.9	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2645E+19	799.9	0.0012	0.6949	0.0000
W-179m	6.4000	m	1.09	1.4771E+16	720.6	0.0552	0.0000	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
Cr-49	41.900	m	0.72	4.2232E+16	314.7	1.0600	0.0000	0.5970
N-13	9.9670	m	0.04	9.7776E+15	306.3	1.0200	0.0000	0.4909
P-30	2.4980	m	0.16	1.8192E+15	227.4	1.0300	0.0000	1.4350
W-179	37.050	m	0.43	2.4607E+16	207.4	0.0005	0.0000	0.0000
S-37	4.9900	m	0.40	2.7932E+15	174.8	2.9310	0.7998	0.0000
Ta-182n	15.840	m	0.63	4.8752E+15	96.10	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	1.4486E+12	95.89	0.0017	0.0122	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8684E+17	85.11	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0960E+19	77.43	1.2910	0.2070	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 141
Total activity (Ci) = 7.51076E+08

Total number of decays = 4.78785E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.7265
Average chain length = 1.5377

Average gamma E (MeV) = 0.52002
Average beta E (MeV) = 0.29993
Average alpha E (MeV) = 1.06798E-16

Composite Exposure Rate Conversion Factor = 10.3888960 R/hr per Ci/m2
Composite ECF per FGR table = 8.52059174 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.50020027 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.67809343 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	1.7349E+21	3.2494E+08	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	8.9957E+22	1.8130E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4698E+23	7.5707E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	2.2187E+20	1.9569E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.5091E+20	1.2581E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	4.4582E+19	6.2087E+06	1.7790	1.2470	0.0000
Co-58m	8.9000	h	1.12	3.5570E+21	2.0798E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	5.0482E+19	1.5054E+06	0.0066	0.0536	0.0000
Mn-57	1.4230	m	2.11	4.1856E+18	9.1839E+05	0.0976	1.0900	0.0000
Ni-65	2.5200	h	0.04	4.0885E+20	8.4427E+05	0.5583	0.6276	0.0000
V-53	1.6200	m	2.47	3.8884E+18	7.4942E+05	1.0380	1.0090	0.0000
Cr-51	27.710	d	0.01	4.2697E+22	3.3410E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.0671E+19	1.6023E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	3.8398E+18	1.1418E+05	1.5700	1.0570	0.0000
Ti-51	5.8000	m	0.52	1.5528E+18	8.3592E+04	0.3692	0.8684	0.0000
Hf-183	1.0670	h	1.59	1.5894E+19	7.7517E+04	0.7528	0.4179	0.0000
Al-29	6.5600	m	0.91	1.4814E+18	7.0508E+04	1.3790	0.9765	0.0000
W-185	75.100	d	0.40	1.4279E+22	4.1225E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0205E+19	3.2184E+04	0.0970	0.4590	0.0000
Co-62	1.5000	m	2.67	8.4041E+16	1.7493E+04	1.5990	1.6430	0.0000
Hf-180m	5.5000	h	1.82	1.2751E+19	1.2064E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.5909E+21	1.0988E+04	0.9770	0.0036	0.0300
Co-62m	13.910	m	0.36	3.8122E+17	8557.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.3176E+17	6879.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	1.8955E+17	6258.	0.8914	0.7010	0.0000
Hf-179m	18.670	s	0.21	5.8373E+15	5857.	0.2370	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7327E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	9.3317E+16	3424.	1.2070	0.0000	1.1050
Fe-53m	2.5800	m	1.16	2.7342E+16	3309.	3.0540	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8413E+18	2896.	1.5620	0.4113	0.0000
V-54	49.800	s	1.00	7.3225E+15	2755.	4.1000	1.4680	0.0000
Mn-58m	1.0870	m	0.77	7.3178E+15	2102.	2.3780	1.7530	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.9242E+19	1672.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.6335E+17	1337.	0.9860	0.0888	0.0000
Ta-185	49.000	m	4.08	1.2967E+17	826.3	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2643E+19	799.9	0.0012	0.6949	0.0000
W-179m	6.4000	m	1.09	1.3643E+16	665.6	0.0552	0.0000	0.0000
W-181	120.90	d	0.10	3.2930E+20	590.6	0.0397	0.0000	0.0000
Cr-49	41.900	m	0.72	4.1723E+16	310.9	1.0600	0.0000	0.5970
N-13	9.9670	m	0.04	9.2917E+15	291.1	1.0200	0.0000	0.4909
W-179	37.050	m	0.43	2.5388E+16	214.0	0.0005	0.0000	0.0000
P-30	2.4980	m	0.16	1.4844E+15	185.5	1.0300	0.0000	1.4350
S-37	4.9900	m	0.40	2.5228E+15	157.9	2.9310	0.7998	0.0000
Ta-182n	15.840	m	0.63	5.9683E+15	117.6	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	1.7742E+12	117.4	0.0017	0.0122	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8670E+17	85.09	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0960E+19	77.43	1.2910	0.2070	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 139
 Total activity (Ci) = 6.27426E+08

Total number of decays = 4.89951E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.7901
 Average chain length = 1.5377

Average gamma E (MeV) = 0.60650
 Average beta E (MeV) = 0.34550
 Average alpha E (MeV) = 1.77728E-18

Composite Exposure Rate Conversion Factor = 11.8193417 R/hr per Ci/m2
 Composite ECF per FGR table = 10.0922766 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 7.58128214 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 4.59357548 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-185m	1.6670	m	2.00	1.1856E+21	2.2207E+08	0.0274	0.0000	0.0000
Mn-56	2.5820	h	0.19	8.9590E+22	1.8056E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4683E+23	7.5674E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	1.8546E+20	1.6357E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.2739E+20	1.0620E+07	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	3.3592E+19	4.6782E+06	1.7790	1.2470	0.0000
Co-58m	8.9000	h	1.12	3.5528E+21	2.0773E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	4.7513E+19	1.4169E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.0714E+20	8.4074E+05	0.5583	0.6276	0.0000
Mn-57	1.4230	m	2.11	2.6797E+18	5.8798E+05	0.0976	1.0900	0.0000
V-53	1.6200	m	2.47	2.6281E+18	5.0653E+05	1.0380	1.0090	0.0000
Cr-51	27.710	d	0.01	4.2697E+22	3.3409E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	8.0346E+19	1.5958E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	3.6146E+18	1.0748E+05	1.5700	1.0570	0.0000
Hf-183	1.0670	h	1.59	1.5738E+19	7.6753E+04	0.7528	0.4179	0.0000
Ti-51	5.8000	m	0.52	1.3919E+18	7.4928E+04	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	1.3448E+18	6.4007E+04	1.3790	0.9765	0.0000
W-185	75.100	d	0.40	1.4828E+22	4.2811E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0153E+19	3.2020E+04	0.0970	0.4590	0.0000
Hf-180m	5.5000	h	1.82	1.2727E+19	1.2041E+04	0.9980	0.0000	0.0000
Co-62	1.5000	m	2.67	5.5189E+16	1.1488E+04	1.5990	1.6430	0.0000
Co-58	70.860	d	0.10	3.5951E+21	1.1001E+04	0.9770	0.0036	0.0300
Co-62m	13.910	m	0.36	3.6422E+17	8175.	2.6830	1.0620	0.0000
Fe-61	5.9800	m	1.00	1.1849E+17	6187.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	1.7725E+17	5852.	0.8914	0.7010	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7326E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	9.2348E+16	3388.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8354E+18	2892.	1.5620	0.4113	0.0000
Fe-53m	2.5800	m	1.16	2.1381E+16	2587.	3.0540	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	3.9396E+19	1678.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.6065E+17	1323.	0.9860	0.0888	0.0000
V-54	49.800	s	1.00	3.4090E+15	1282.	4.1000	1.4680	0.0000
Mn-58m	1.0870	m	0.77	4.0818E+15	1172.	2.3780	1.7530	0.0000
Ta-185	49.000	m	4.08	1.2801E+17	815.7	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2642E+19	799.9	0.0012	0.6949	0.0000
Hf-179m	18.670	s	0.21	7.5955E+14	762.1	0.2370	0.0000	0.0000
W-179m	6.4000	m	1.09	1.2356E+16	602.8	0.0552	0.0000	0.0000
W-181	120.90	d	0.10	3.2929E+20	590.6	0.0397	0.0000	0.0000
Cr-49	41.900	m	0.72	4.1095E+16	306.2	1.0600	0.0000	0.5970
N-13	9.9670	m	0.04	8.7185E+15	273.1	1.0200	0.0000	0.4909
W-179	37.050	m	0.43	2.6230E+16	221.0	0.0005	0.0000	0.0000
P-30	2.4980	m	0.16	1.1514E+15	143.9	1.0300	0.0000	1.4350
Ta-182n	15.840	m	0.63	7.2708E+15	143.3	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	2.1622E+12	143.1	0.0017	0.0122	0.0000
S-37	4.9900	m	0.40	2.2215E+15	139.0	2.9310	0.7998	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8653E+17	85.07	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0960E+19	77.43	1.2910	0.2070	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 139
 Total activity (Ci) = 5.16368E+08

Total number of decays = 5.01506E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 2.8559
 Average chain length = 1.5377

Average gamma E (MeV) = 0.71760
 Average beta E (MeV) = 0.40274
 Average alpha E (MeV) = 1.03573E-20

Composite Exposure Rate Conversion Factor = 13.6577587 R/hr per Ci/m2
 Composite ECF per FGR table = 12.1270914 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 8.96999359 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 5.73692894 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	8.9133E+22	1.7964E+08	1.6910	0.8309	0.0000
W-185m	1.6670	m	2.00	7.3703E+20	1.3805E+08	0.0274	0.0000	0.0000
W-187	23.850	h	0.34	3.4664E+23	7.5632E+07	0.4476	0.2710	0.0000
Cr-55	3.5400	m	0.85	1.4826E+20	1.3076E+07	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.0309E+20	8.5948E+06	1.4450	1.0680	0.0000
Al-28	2.2420	m	0.13	2.3590E+19	3.2852E+06	1.7790	1.2470	0.0000
Co-58m	8.9000	h	1.12	3.5475E+21	2.0742E+06	0.0019	0.0208	0.0000
Co-60m	10.470	m	0.38	4.4049E+19	1.3136E+06	0.0066	0.0536	0.0000
Ni-65	2.5200	h	0.04	4.0501E+20	8.3634E+05	0.5583	0.6276	0.0000
Mn-57	1.4230	m	2.11	1.5354E+18	3.3689E+05	0.0976	1.0900	0.0000
Cr-51	27.710	d	0.01	4.2696E+22	3.3409E+05	0.0328	0.0031	0.0000
V-53	1.6200	m	2.47	1.6114E+18	3.1056E+05	1.0380	1.0090	0.0000
Si-31	2.6200	h	0.38	7.9942E+19	1.5878E+05	0.0018	0.5952	0.0000
Ta-186	10.500	m	2.86	3.3518E+18	9.9669E+04	1.5700	1.0570	0.0000
Hf-183	1.0670	h	1.59	1.5544E+19	7.5808E+04	0.7528	0.4179	0.0000
Ti-51	5.8000	m	0.52	1.2141E+18	6.5359E+04	0.3692	0.8684	0.0000
Al-29	6.5600	m	0.91	1.1918E+18	5.6723E+04	1.3790	0.9765	0.0000
W-185	75.100	d	0.40	1.5277E+22	4.4106E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	1.0086E+19	3.1811E+04	0.0970	0.4590	0.0000
Hf-180m	5.5000	h	1.82	1.2696E+19	1.2012E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.6004E+21	1.1017E+04	0.9770	0.0036	0.0300
Co-62m	13.910	m	0.36	3.4405E+17	7723.	2.6830	1.0620	0.0000
Co-62	1.5000	m	2.67	3.2695E+16	6806.	1.5990	1.6430	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-61	5.9800	m	1.00	1.0378E+17	5419.	1.3970	1.1990	0.0000
Mg-27	9.4580	m	0.13	1.6301E+17	5381.	0.8914	0.7010	0.0000
Fe-59	44.490	d	0.02	7.7325E+20	3769.	1.1880	0.1176	0.0000
Fe-53	8.5100	m	0.82	8.9522E+16	3285.	1.2070	0.0000	1.1050
Ta-184	8.7000	h	1.15	4.8281E+18	2888.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000
Fe-53m	2.5800	m	1.16	1.5726E+16	1903.	3.0540	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.9585E+19	1686.	0.2936	0.1877	0.0000
Hf-182m	1.0250	h	2.44	2.5731E+17	1306.	0.9860	0.0888	0.0000
Ta-185	49.000	m	4.08	1.2595E+17	802.6	0.1450	0.6334	0.0000
P-32	14.270	d	0.28	5.2640E+19	799.8	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2929E+20	590.6	0.0397	0.0000	0.0000
Mn-58m	1.0870	m	0.77	1.9689E+15	565.5	2.3780	1.7530	0.0000
W-179m	6.4000	m	1.09	1.0916E+16	532.6	0.0552	0.0000	0.0000
V-54	49.800	s	1.00	1.3120E+15	493.6	4.1000	1.4680	0.0000
Cr-49	41.900	m	0.72	4.0325E+16	300.5	1.0600	0.0000	0.5970
N-13	9.9670	m	0.04	8.0521E+15	252.2	1.0200	0.0000	0.4909
W-179	37.050	m	0.43	2.7095E+16	228.3	0.0005	0.0000	0.0000
Ta-182n	15.840	m	0.63	8.8039E+15	173.5	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	2.6189E+12	173.4	0.0017	0.0122	0.0000
S-37	4.9900	m	0.40	1.8953E+15	118.6	2.9310	0.7998	0.0000
P-30	2.4980	m	0.16	8.3839E+14	104.8	1.0300	0.0000	1.4350
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8632E+17	85.04	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0960E+19	77.43	1.2910	0.2070	0.0000
Hf-179m	18.670	s	0.21	5.9490E+13	59.69	0.2370	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 139
Total activity (Ci) = 4.24087E+08

Total number of decays = 5.13353E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.9234
Average chain length = 1.5377

Average gamma E (MeV) = 0.85118
Average beta E (MeV) = 0.46961
Average alpha E (MeV) = 1.60102E-23

Composite Exposure Rate Conversion Factor = 15.8696842 R/hr per Ci/m2
Composite ECF per FGR table = 14.5976896 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.6397190 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 7.16485834 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820 h 0.19	8.8565E+22	1.7850E+08	1.6910	0.8309	0.0000	0.0000
W-185m	1.6670 m 2.00	4.0703E+20	7.6237E+07	0.0274	0.0000	0.0000	0.0000
W-187	23.850 h 0.34	3.4640E+23	7.5580E+07	0.4476	0.2710	0.0000	0.0000
Cr-55	3.5400 m 0.85	1.1210E+20	9.8870E+06	0.0033	1.1010	0.0000	0.0000
V-52	3.7450 m 0.13	7.9148E+19	6.5987E+06	1.4450	1.0680	0.0000	0.0000
Al-28	2.2420 m 0.13	1.5171E+19	2.1127E+06	1.7790	1.2470	0.0000	0.0000
Co-58m	8.9000 h 1.12	3.5409E+21	2.0704E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470 m 0.38	4.0076E+19	1.1951E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200 h 0.04	4.0236E+20	8.3088E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710 d 0.01	4.2695E+22	3.3408E+05	0.0328	0.0031	0.0000	0.0000
V-53	1.6200 m 2.47	8.7469E+17	1.6858E+05	1.0380	1.0090	0.0000	0.0000
Mn-57	1.4230 m 2.11	7.6586E+17	1.6804E+05	0.0976	1.0900	0.0000	0.0000
Si-31	2.6200 h 0.38	7.9440E+19	1.5778E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500 m 2.86	3.0503E+18	9.0703E+04	1.5700	1.0570	0.0000	0.0000
Hf-183	1.0670 h 1.59	1.5305E+19	7.4645E+04	0.7528	0.4179	0.0000	0.0000
Ti-51	5.8000 m 0.52	1.0236E+18	5.5105E+04	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600 m 0.91	1.0249E+18	4.8779E+04	1.3790	0.9765	0.0000	0.0000
W-185	75.100 d 0.40	1.5606E+22	4.5058E+04	0.0001	0.1269	0.0000	0.0000
Co-61	1.6500 h 0.30	1.0002E+19	3.1544E+04	0.0970	0.4590	0.0000	0.0000
Hf-180m	5.5000 h 1.82	1.2658E+19	1.1976E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860 d 0.10	3.6069E+21	1.1037E+04	0.9770	0.0036	0.0300	0.0000
Co-62m	13.910 m 0.36	3.2042E+17	7192.	2.6830	1.0620	0.0000	0.0000
Fe-55	2.7351 y 0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Mg-27	9.4580 m 0.13	1.4681E+17	4847.	0.8914	0.7010	0.0000	0.0000
Fe-61	5.9800 m 1.00	8.7952E+16	4592.	1.3970	1.1990	0.0000	0.0000
Fe-59	44.490 d 0.02	7.7324E+20	3768.	1.1880	0.1176	0.0000	0.0000
Co-62	1.5000 m 2.67	1.7073E+16	3554.	1.5990	1.6430	0.0000	0.0000
Fe-53	8.5100 m 0.82	8.4406E+16	3097.	1.2070	0.0000	1.1050	0.0000
Ta-184	8.7000 h 1.15	4.8189E+18	2882.	1.5620	0.4113	0.0000	0.0000
Mn-54	312.20 d 0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900 d 1.38	3.9818E+19	1696.	0.2936	0.1877	0.0000	0.0000
Fe-53m	2.5800 m 1.16	1.0715E+16	1297.	3.0540	0.0000	0.0000	0.0000
Hf-182m	1.0250 h 2.44	2.5320E+17	1285.	0.9860	0.0888	0.0000	0.0000
P-32	14.270 d 0.28	5.2637E+19	799.8	0.0012	0.6949	0.0000	0.0000
Ta-185	49.000 m 4.08	1.2343E+17	786.5	0.1450	0.6334	0.0000	0.0000
W-181	120.90 d 0.10	3.2929E+20	590.6	0.0397	0.0000	0.0000	0.0000
W-179m	6.4000 m 1.09	9.3523E+15	456.3	0.0552	0.0000	0.0000	0.0000
Cr-49	41.900 m 0.72	3.9384E+16	293.5	1.0600	0.0000	0.5970	0.0000
W-179	37.050 m 0.43	2.7919E+16	235.3	0.0005	0.0000	0.0000	0.0000
N-13	9.9670 m 0.04	7.2909E+15	228.4	1.0200	0.0000	0.4909	0.0000
Mn-58m	1.0870 m 0.77	7.9208E+14	227.5	2.3780	1.7530	0.0000	0.0000
Ta-182n	15.840 m 0.63	1.0580E+16	208.5	0.2667	0.5060	0.0000	0.0000
Ta-182m	0.28300 s 1.06	3.1480E+12	208.4	0.0017	0.0122	0.0000	0.0000
V-54	49.800 s 1.00	3.9816E+14	149.8	4.1000	1.4680	0.0000	0.0000
S-37	4.9900 m 0.40	1.5543E+15	97.25	2.9310	0.7998	0.0000	0.0000
Ni-63	100.60 y 1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950 d 0.84	5.8605E+17	85.00	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70 d 0.35	4.0961E+19	77.43	1.2910	0.2070	0.0000	0.0000
P-30	2.4980 m 0.16	5.6411E+14	70.51	1.0300	0.0000	1.4350	0.0000
W-183m	5.2500 s 1.33	1.6153E+13	57.64	0.1276	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 139
Total activity (Ci) = 3.54250E+08

Total number of decays = 5.25588E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 2.9930
Average chain length = 1.5377

Average gamma E (MeV) = 0.99401
Average beta E (MeV) = 0.53835
Average alpha E (MeV) = 4.62693E-27

Composite Exposure Rate Conversion Factor = 18.2369957 R/hr per Ci/m2
Composite ECF per FGR table = 17.2740059 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.4251871 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 8.94820118 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	8.7861E+22	1.7708E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.4610E+23	7.5514E+07	0.4476	0.2710	0.0000	0.0000
W-185m	1.6670	m	2.00	1.9390E+20	3.6318E+07	0.0274	0.0000	0.0000	0.0000
Cr-55	3.5400	m	0.85	7.9058E+19	6.9729E+06	0.0033	1.1010	0.0000	0.0000
V-52	3.7450	m	0.13	5.6897E+19	4.7436E+06	1.4450	1.0680	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.5327E+21	2.0656E+06	0.0019	0.0208	0.0000	0.0000
Al-28	2.2420	m	0.13	8.7408E+18	1.2173E+06	1.7790	1.2470	0.0000	0.0000
Co-60m	10.470	m	0.38	3.5613E+19	1.0620E+06	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	3.9909E+20	8.2412E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2693E+22	3.3407E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	7.8818E+19	1.5655E+05	0.0018	0.5952	0.0000	0.0000
Ta-186	10.500	m	2.86	2.7115E+18	8.0630E+04	1.5700	1.0570	0.0000	0.0000
V-53	1.6200	m	2.47	4.0782E+17	7.8601E+04	1.0380	1.0090	0.0000	0.0000
Hf-183	1.0670	h	1.59	1.5013E+19	7.3218E+04	0.7528	0.4179	0.0000	0.0000
Mn-57	1.4230	m	2.11	3.2128E+17	7.0495E+04	0.0976	1.0900	0.0000	0.0000
W-185	75.100	d	0.40	1.5819E+22	4.5673E+04	0.0001	0.1269	0.0000	0.0000
Ti-51	5.8000	m	0.52	8.2716E+17	4.4528E+04	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600	m	0.91	8.4885E+17	4.0402E+04	1.3790	0.9765	0.0000	0.0000
Co-61	1.6500	h	0.30	9.8940E+18	3.1204E+04	0.0970	0.4590	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2611E+19	1.1932E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860	d	0.10	3.6151E+21	1.1062E+04	0.9770	0.0036	0.0300	0.0000
Co-62m	13.910	m	0.36	2.9317E+17	6581.	2.6830	1.0620	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Mg-27	9.4580	m	0.13	1.2882E+17	4253.	0.8914	0.7010	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7323E+20	3768.	1.1880	0.1176	0.0000	0.0000
Fe-61	5.9800	m	1.00	7.1528E+16	3735.	1.3970	1.1990	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.8075E+18	2876.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100	m	0.82	7.6769E+16	2817.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20	d	0.01	2.9240E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.0104E+19	1708.	0.2936	0.1877	0.0000	0.0000
Co-62	1.5000	m	2.67	7.6735E+15	1597.	1.5990	1.6430	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.4817E+17	1260.	0.9860	0.0888	0.0000	0.0000
Fe-53m	2.5800	m	1.16	6.6364E+15	803.1	3.0540	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	5.2634E+19	799.7	0.0012	0.6949	0.0000	0.0000
Ta-185	49.000	m	4.08	1.2036E+17	766.9	0.1450	0.6334	0.0000	0.0000
W-181	120.90	d	0.10	3.2929E+20	590.6	0.0397	0.0000	0.0000	0.0000
W-179m	6.4000	m	1.09	7.7097E+15	376.1	0.0552	0.0000	0.0000	0.0000
Cr-49	41.900	m	0.72	3.8239E+16	284.9	1.0600	0.0000	0.5970	0.0000
Ta-182n	15.840	m	0.63	1.2597E+16	248.3	0.2667	0.5060	0.0000	0.0000
Ta-182m	0.28300	s	1.06	3.7487E+12	248.2	0.0017	0.0122	0.0000	0.0000
W-179	37.050	m	0.43	2.8613E+16	241.1	0.0005	0.0000	0.0000	0.0000
N-13	9.9670	m	0.04	6.4405E+15	201.8	1.0200	0.0000	0.4909	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.8571E+17	84.95	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70	d	0.35	4.0961E+19	77.43	1.2910	0.2070	0.0000	0.0000
S-37	4.9900	m	0.40	1.2133E+15	75.91	2.9310	0.7998	0.0000	0.0000
Mn-58m	1.0870	m	0.77	2.5404E+14	72.97	2.3780	1.7530	0.0000	0.0000
W-183m	5.2500	s	1.33	1.6270E+13	58.06	0.1276	0.0000	0.0000	0.0000
P-30	2.4980	m	0.16	3.4392E+14	42.99	1.0300	0.0000	1.4350	0.0000
V-54	49.800	s	1.00	8.9797E+13	33.78	4.1000	1.4680	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 138
 Total activity (Ci) = 3.06815E+08

Total number of decays = 5.38569E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 3.0670
 Average chain length = 1.5377

Average gamma E (MeV) = 1.1218
 Average beta E (MeV) = 0.59634
 Average alpha E (MeV) = 1.62234E-31

Composite Exposure Rate Conversion Factor = 20.3568039 R/hr per Ci/m2
 Composite ECF per FGR table = 19.7124367 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 14.0221062 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 11.1754322 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820 h 0.19	8.6990E+22	1.7532E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850 h 0.34	3.4572E+23	7.5433E+07	0.4476	0.2710	0.0000	0.0000
W-185m	1.6670 m 2.00	7.6805E+19	1.4386E+07	0.0274	0.0000	0.0000	0.0000
Cr-55	3.5400 m 0.85	5.1115E+19	4.5083E+06	0.0033	1.1010	0.0000	0.0000
V-52	3.7450 m 0.13	3.7676E+19	3.1411E+06	1.4450	1.0680	0.0000	0.0000
Co-58m	8.9000 h 1.12	3.5225E+21	2.0596E+06	0.0019	0.0208	0.0000	0.0000
Co-60m	10.470 m 0.38	3.0731E+19	9.1643E+05	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200 h 0.04	3.9503E+20	8.1575E+05	0.5583	0.6276	0.0000	0.0000
Al-28	2.2420 m 0.13	4.3904E+18	6.1142E+05	1.7790	1.2470	0.0000	0.0000
Cr-51	27.710 d 0.01	4.2692E+22	3.3405E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200 h 0.38	7.8048E+19	1.5502E+05	0.0018	0.5952	0.0000	0.0000
Hf-183	1.0670 h 1.59	1.4655E+19	7.1473E+04	0.7528	0.4179	0.0000	0.0000
Ta-186	10.500 m 2.86	2.3408E+18	6.9605E+04	1.5700	1.0570	0.0000	0.0000
W-185	75.100 d 0.40	1.5936E+22	4.6010E+04	0.0001	0.1269	0.0000	0.0000
Ti-51	5.8000 m 0.52	6.3386E+17	3.4122E+04	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600 m 0.91	6.7085E+17	3.1930E+04	1.3790	0.9765	0.0000	0.0000
Co-61	1.6500 h 0.30	9.7571E+18	3.0772E+04	0.0970	0.4590	0.0000	0.0000
V-53	1.6200 m 2.47	1.5725E+17	3.0308E+04	1.0380	1.0090	0.0000	0.0000
Mn-57	1.4230 m 2.11	1.0857E+17	2.3823E+04	0.0976	1.0900	0.0000	0.0000
Hf-180m	5.5000 h 1.82	1.2552E+19	1.1876E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860 d 0.10	3.6252E+21	1.1093E+04	0.9770	0.0036	0.0300	0.0000
Co-62m	13.910 m 0.36	2.6237E+17	5889.	2.6830	1.0620	0.0000	0.0000
Fe-55	2.7351 y 0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490 d 0.02	7.7321E+20	3768.	1.1880	0.1176	0.0000	0.0000
Mg-27	9.4580 m 0.13	1.0942E+17	3612.	0.8914	0.7010	0.0000	0.0000
Fe-61	5.9800 m 1.00	5.5253E+16	2885.	1.3970	1.1990	0.0000	0.0000
Ta-184	8.7000 h 1.15	4.7933E+18	2867.	1.5620	0.4113	0.0000	0.0000
Fe-53	8.5100 m 0.82	6.6741E+16	2449.	1.2070	0.0000	1.1050	0.0000
Mn-54	312.20 d 0.01	2.9239E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900 d 1.38	4.0453E+19	1723.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250 h 2.44	2.4201E+17	1229.	0.9860	0.0888	0.0000	0.0000
P-32	14.270 d 0.28	5.2630E+19	799.7	0.0012	0.6949	0.0000	0.0000
Ta-185	49.000 m 4.08	1.1663E+17	743.1	0.1450	0.6334	0.0000	0.0000
Co-62	1.5000 m 2.67	2.9322E+15	610.3	1.5990	1.6430	0.0000	0.0000
W-181	120.90 d 0.10	3.2929E+20	590.5	0.0397	0.0000	0.0000	0.0000
Fe-53m	2.5800 m 1.16	3.6481E+15	441.5	3.0540	0.0000	0.0000	0.0000
W-179m	6.4000 m 1.09	6.0573E+15	295.5	0.0552	0.0000	0.0000	0.0000
Ta-182n	15.840 m 0.63	1.4826E+16	292.2	0.2667	0.5060	0.0000	0.0000
Ta-182m	0.28300 s 1.06	4.4129E+12	292.1	0.0017	0.0122	0.0000	0.0000
Cr-49	41.900 m 0.72	3.6856E+16	274.6	1.0600	0.0000	0.5970	0.0000
W-179	37.050 m 0.43	2.9058E+16	244.9	0.0005	0.0000	0.0000	0.0000
N-13	9.9670 m 0.04	5.5164E+15	172.8	1.0200	0.0000	0.4909	0.0000
Ni-63	100.60 y 1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950 d 0.84	5.8529E+17	84.89	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70 d 0.35	4.0962E+19	77.43	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500 s 1.33	1.6412E+13	58.56	0.1276	0.0000	0.0000	0.0000
S-37	4.9900 m 0.40	8.9041E+14	55.71	2.9310	0.7998	0.0000	0.0000
Co-57	271.80 d 0.02	4.1361E+19	33.00	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380 d 0.14	6.4182E+18	32.84	0.5180	0.1204	0.0000	0.0000
P-30	2.4980 m 0.16	1.8538E+14	23.17	1.0300	0.0000	1.4350	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 138
 Total activity (Ci) = 2.78079E+08

Total number of decays = 5.52937E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 3.1488
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2121
 Average beta E (MeV) = 0.63347
 Average alpha E (MeV) = 4.08133E-37

Composite Exposure Rate Conversion Factor = 21.8583221 R/hr per Ci/m2
 Composite ECF per FGR table = 21.4880829 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.1514626 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 13.9570141 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820 h 0.19	8.5914E+22	1.7315E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850 h 0.34	3.4526E+23	7.5331E+07	0.4476	0.2710	0.0000	0.0000
W-185m	1.6670 m 2.00	2.4159E+19	4.5250E+06	0.0274	0.0000	0.0000	0.0000
Cr-55	3.5400 m 0.85	2.9649E+19	2.6151E+06	0.0033	1.1010	0.0000	0.0000
Co-58m	8.9000 h 1.12	3.5098E+21	2.0522E+06	0.0019	0.0208	0.0000	0.0000
V-52	3.7450 m 0.13	2.2515E+19	1.8771E+06	1.4450	1.0680	0.0000	0.0000
Ni-65	2.5200 h 0.04	3.9003E+20	8.0541E+05	0.5583	0.6276	0.0000	0.0000
Co-60m	10.470 m 0.38	2.5562E+19	7.6230E+05	0.0066	0.0536	0.0000	0.0000
Cr-51	27.710 d 0.01	4.2690E+22	3.3404E+05	0.0328	0.0031	0.0000	0.0000
Al-28	2.2420 m 0.13	1.8579E+18	2.5874E+05	1.7790	1.2470	0.0000	0.0000
Si-31	2.6200 h 0.38	7.7096E+19	1.5313E+05	0.0018	0.5952	0.0000	0.0000
Hf-183	1.0670 h 1.59	1.4220E+19	6.9353E+04	0.7528	0.4179	0.0000	0.0000
Ta-186	10.500 m 2.86	1.9481E+18	5.7929E+04	1.5700	1.0570	0.0000	0.0000
W-185	75.100 d 0.40	1.5989E+22	4.6161E+04	0.0001	0.1269	0.0000	0.0000
Co-61	1.6500 h 0.30	9.5840E+18	3.0226E+04	0.0970	0.4590	0.0000	0.0000
Ti-51	5.8000 m 0.52	4.5459E+17	2.4472E+04	0.3692	0.8684	0.0000	0.0000
Al-29	6.5600 m 0.91	5.0001E+17	2.3799E+04	1.3790	0.9765	0.0000	0.0000
Hf-180m	5.5000 h 1.82	1.2479E+19	1.1807E+04	0.9980	0.0000	0.0000	0.0000
Co-58	70.860 d 0.10	3.6378E+21	1.1131E+04	0.9770	0.0036	0.0300	0.0000
V-53	1.6200 m 2.47	4.7833E+16	9219.	1.0380	1.0090	0.0000	0.0000
Mn-57	1.4230 m 2.11	2.8009E+16	6146.	0.0976	1.0900	0.0000	0.0000
Fe-55	2.7351 y 0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000	0.0000
Co-62m	13.910 m 0.36	2.2841E+17	5127.	2.6830	1.0620	0.0000	0.0000
Fe-59	44.490 d 0.02	7.7318E+20	3768.	1.1880	0.1176	0.0000	0.0000
Mg-27	9.4580 m 0.13	8.9244E+16	2946.	0.8914	0.7010	0.0000	0.0000
Ta-184	8.7000 h 1.15	4.7757E+18	2857.	1.5620	0.4113	0.0000	0.0000
Fe-61	5.9800 m 1.00	4.0025E+16	2090.	1.3970	1.1990	0.0000	0.0000
Mn-54	312.20 d 0.01	2.9239E+21	2031.	0.8359	0.0034	0.0000	0.0000
Fe-53	8.5100 m 0.82	5.4905E+16	2014.	1.2070	0.0000	1.1050	0.0000
Ta-183	5.0900 d 1.38	4.0877E+19	1741.	0.2936	0.1877	0.0000	0.0000
Hf-182m	1.0250 h 2.44	2.3454E+17	1191.	0.9860	0.0888	0.0000	0.0000
P-32	14.270 d 0.28	5.2625E+19	799.6	0.0012	0.6949	0.0000	0.0000
Ta-185	49.000 m 4.08	1.1213E+17	714.5	0.1450	0.6334	0.0000	0.0000
W-181	120.90 d 0.10	3.2928E+20	590.5	0.0397	0.0000	0.0000	0.0000
Ta-182n	15.840 m 0.63	1.7205E+16	339.1	0.2667	0.5060	0.0000	0.0000
Ta-182m	0.28300 s 1.06	5.1214E+12	339.0	0.0017	0.0122	0.0000	0.0000
Cr-49	41.900 m 0.72	3.5198E+16	262.3	1.0600	0.0000	0.5970	0.0000
W-179	37.050 m 0.43	2.9113E+16	245.3	0.0005	0.0000	0.0000	0.0000
W-179m	6.4000 m 1.09	4.4817E+15	218.6	0.0552	0.0000	0.0000	0.0000
Fe-53m	2.5800 m 1.16	1.7279E+15	209.1	3.0540	0.0000	0.0000	0.0000
Co-62	1.5000 m 2.67	9.9929E+14	208.0	1.5990	1.6430	0.0000	0.0000
N-13	9.9670 m 0.04	4.5461E+15	142.4	1.0200	0.0000	0.4909	0.0000
Ni-63	100.60 y 1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950 d 0.84	5.8477E+17	84.81	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70 d 0.35	4.0964E+19	77.44	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500 s 1.33	1.6584E+13	59.18	0.1276	0.0000	0.0000	0.0000
S-37	4.9900 m 0.40	6.0504E+14	37.86	2.9310	0.7998	0.0000	0.0000
Co-57	271.80 d 0.02	4.1362E+19	33.00	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380 d 0.14	6.4180E+18	32.84	0.5180	0.1204	0.0000	0.0000
Mn-52m	21.200 m 1.89	9.2569E+14	13.63	2.4200	0.0004	1.1140	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 137
 Total activity (Ci) = 2.62191E+08

Total number of decays = 5.69550E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 3.2434
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2607
 Average beta E (MeV) = 0.64976
 Average alpha E (MeV) = 3.92364E-44

Composite Exposure Rate Conversion Factor = 22.6677284 R/hr per Ci/m2
 Composite ECF per FGR table = 22.4946613 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.7590771 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 17.4309502 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	8.4589E+22	1.7048E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4468E+23	7.5205E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.4940E+21	2.0430E+06	0.0019	0.0208	0.0000
Cr-55	3.5400	m	0.85	1.5018E+19	1.3245E+06	0.0033	1.1010	0.0000
W-185m	1.6670	m	2.00	5.6984E+18	1.0673E+06	0.0274	0.0000	0.0000
V-52	3.7450	m	0.13	1.1837E+19	9.8685E+05	1.4450	1.0680	0.0000
Ni-65	2.5200	h	0.04	3.8387E+20	7.9269E+05	0.5583	0.6276	0.0000
Co-60m	10.470	m	0.38	2.0310E+19	6.0568E+05	0.0066	0.0536	0.0000
Cr-51	27.710	d	0.01	4.2687E+22	3.3402E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	7.5924E+19	1.5080E+05	0.0018	0.5952	0.0000
Al-28	2.2420	m	0.13	6.3473E+17	8.8394E+04	1.7790	1.2470	0.0000
Hf-183	1.0670	h	1.59	1.3695E+19	6.6793E+04	0.7528	0.4179	0.0000
W-185	75.100	d	0.40	1.6007E+22	4.6214E+04	0.0001	0.1269	0.0000
Ta-186	10.500	m	2.86	1.5489E+18	4.6057E+04	1.5700	1.0570	0.0000
Co-61	1.6500	h	0.30	9.3668E+18	2.9541E+04	0.0970	0.4590	0.0000
Al-29	6.5600	m	0.91	3.4639E+17	1.6487E+04	1.3790	0.9765	0.0000
Ti-51	5.8000	m	0.52	3.0014E+17	1.6157E+04	0.3692	0.8684	0.0000
Hf-180m	5.5000	h	1.82	1.2388E+19	1.1721E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.6535E+21	1.1179E+04	0.9770	0.0036	0.0300
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Co-62m	13.910	m	0.36	1.9211E+17	4312.	2.6830	1.0620	0.0000
Fe-59	44.490	d	0.02	7.7315E+20	3768.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.7537E+18	2843.	1.5620	0.4113	0.0000
Mg-27	9.4580	m	0.13	6.9184E+16	2284.	0.8914	0.7010	0.0000
V-53	1.6200	m	2.47	1.0819E+16	2085.	1.0380	1.0090	0.0000
Mn-54	312.20	d	0.01	2.9239E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	4.1389E+19	1763.	0.2936	0.1877	0.0000
Fe-53	8.5100	m	0.82	4.2267E+16	1551.	1.2070	0.0000	1.1050
Fe-61	5.9800	m	1.00	2.6758E+16	1397.	1.3970	1.1990	0.0000
Hf-182m	1.0250	h	2.44	2.2554E+17	1145.	0.9860	0.0888	0.0000
Mn-57	1.4230	m	2.11	5.1570E+15	1132.	0.0976	1.0900	0.0000
P-32	14.270	d	0.28	5.2619E+19	799.5	0.0012	0.6949	0.0000
Ta-185	49.000	m	4.08	1.0675E+17	680.2	0.1450	0.6334	0.0000
W-181	120.90	d	0.10	3.2928E+20	590.5	0.0397	0.0000	0.0000
Ta-182n	15.840	m	0.63	1.9622E+16	386.8	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	5.8415E+12	386.7	0.0017	0.0122	0.0000
Cr-49	41.900	m	0.72	3.3233E+16	247.6	1.0600	0.0000	0.5970
W-179	37.050	m	0.43	2.8635E+16	241.3	0.0005	0.0000	0.0000
W-179m	6.4000	m	1.09	3.0764E+15	150.1	0.0552	0.0000	0.0000
N-13	9.9670	m	0.04	3.5704E+15	111.8	1.0200	0.0000	0.4909
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8411E+17	84.72	1.9200	0.0044	0.1430
Fe-53m	2.5800	m	1.16	6.7948E+14	82.23	3.0540	0.0000	0.0000
Co-62	1.5000	m	2.67	3.7744E+14	78.57	1.5990	1.6430	0.0000
Ta-182	114.70	d	0.35	4.0966E+19	77.44	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	1.6792E+13	59.92	0.1276	0.0000	0.0000
Co-57	271.80	d	0.02	4.1362E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4177E+18	32.83	0.5180	0.1204	0.0000
S-37	4.9900	m	0.40	3.7344E+14	23.37	2.9310	0.7998	0.0000
Co-60	5.2701	y	0.02	1.0838E+20	12.21	2.5030	0.0964	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 137
Total activity (Ci) = 2.53358E+08

Total number of decays = 5.89388E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 3.3564
Average chain length = 1.5377

Average gamma E (MeV) = 1.2797
Average beta E (MeV) = 0.65308
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.9845123 R/hr per Ci/m2
Composite ECF per FGR table = 22.9345818 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.9968662 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 21.7695389 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	8.2963E+22	1.6720E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4395E+23	7.5047E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.4744E+21	2.0315E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	3.7631E+20	7.7708E+05	0.5583	0.6276	0.0000
Cr-55	3.5400	m	0.85	6.4218E+18	5.6641E+05	0.0033	1.1010	0.0000
Co-60m	10.470	m	0.38	1.5240E+19	4.5447E+05	0.0066	0.0536	0.0000
V-52	3.7450	m	0.13	5.3026E+18	4.4209E+05	1.4450	1.0680	0.0000
Cr-51	27.710	d	0.01	4.2684E+22	3.3399E+05	0.0328	0.0031	0.0000
W-185m	1.6670	m	2.00	9.3818E+17	1.7572E+05	0.0274	0.0000	0.0000
Si-31	2.6200	h	0.38	7.4486E+19	1.4794E+05	0.0018	0.5952	0.0000
Hf-183	1.0670	h	1.59	1.3067E+19	6.3728E+04	0.7528	0.4179	0.0000
W-185	75.100	d	0.40	1.6011E+22	4.6226E+04	0.0001	0.1269	0.0000
Ta-186	10.500	m	2.86	1.1631E+18	3.4587E+04	1.5700	1.0570	0.0000
Co-61	1.6500	h	0.30	9.0969E+18	2.8690E+04	0.0970	0.4590	0.0000
Al-28	2.2420	m	0.13	1.6598E+17	2.3115E+04	1.7790	1.2470	0.0000
Hf-180m	5.5000	h	1.82	1.2276E+19	1.1615E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.6730E+21	1.1239E+04	0.9770	0.0036	0.0300
Al-29	6.5600	m	0.91	2.1902E+17	1.0424E+04	1.3790	0.9765	0.0000
Ti-51	5.8000	m	0.52	1.7871E+17	9620.	0.3692	0.8684	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7312E+20	3768.	1.1880	0.1176	0.0000
Co-62m	13.910	m	0.36	1.5476E+17	3474.	2.6830	1.0620	0.0000
Ta-184	8.7000	h	1.15	4.7264E+18	2827.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9239E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	4.2000E+19	1789.	0.2936	0.1877	0.0000
Mg-27	9.4580	m	0.13	5.0341E+16	1662.	0.8914	0.7010	0.0000
Fe-53	8.5100	m	0.82	3.0065E+16	1103.	1.2070	1.1050	0.0000
Hf-182m	1.0250	h	2.44	2.1478E+17	1090.	0.9860	0.0888	0.0000
Fe-61	5.9800	m	1.00	1.6183E+16	844.9	1.3970	1.1990	0.0000
P-32	14.270	d	0.28	5.2611E+19	799.4	0.0012	0.6949	0.0000
Ta-185	49.000	m	4.08	1.0039E+17	639.7	0.1450	0.6334	0.0000
W-181	120.90	d	0.10	3.2927E+20	590.5	0.0397	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.1910E+16	431.9	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	6.5233E+12	431.8	0.0017	0.0122	0.0000
V-53	1.6200	m	2.47	1.6904E+15	325.8	1.0380	1.0090	0.0000
W-179	37.050	m	0.43	2.7504E+16	231.8	0.0005	0.0000	0.0000
Cr-49	41.900	m	0.72	3.0931E+16	230.5	1.0600	0.0000	0.5970
Mn-57	1.4230	m	2.11	6.2314E+14	136.7	0.0976	1.0900	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
W-179m	6.4000	m	1.09	1.9230E+15	93.81	0.0552	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.8330E+17	84.60	1.9200	0.0044	0.1430
N-13	9.9670	m	0.04	2.6405E+15	82.72	1.0200	0.0000	0.4909
Ta-182	114.70	d	0.35	4.0969E+19	77.45	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	1.7040E+13	60.81	0.1276	0.0000	0.0000
Co-62	1.5000	m	2.67	2.0662E+14	43.01	1.5990	1.6430	0.0000
Co-57	271.80	d	0.02	4.1363E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4174E+18	32.83	0.5180	0.1204	0.0000
Fe-53m	2.5800	m	1.16	2.1182E+14	25.63	3.0540	0.0000	0.0000
S-37	4.9900	m	0.40	2.0440E+14	12.79	2.9310	0.7998	0.0000
Co-60	5.2701	y	0.02	1.1344E+20	12.78	2.5030	0.0964	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 134
Total activity (Ci) = 2.47449E+08

Total number of decays = 6.13483E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 3.4936
Average chain length = 1.5377

Average gamma E (MeV) = 1.2837
Average beta E (MeV) = 0.65124
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 23.0479069 R/hr per Ci/m2
Composite ECF per FGR table = 23.0679073 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0459957 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 27.1880074 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	8.0976E+22	1.6320E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4305E+23	7.4850E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.4501E+21	2.0172E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	3.6708E+20	7.5801E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2680E+22	3.3396E+05	0.0328	0.0031	0.0000
Co-60m	10.470	m	0.38	1.0646E+19	3.1748E+05	0.0066	0.0536	0.0000
Cr-55	3.5400	m	0.85	2.2228E+18	1.9605E+05	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.9451E+18	1.6217E+05	1.4450	1.0680	0.0000
Si-31	2.6200	h	0.38	7.2727E+19	1.4445E+05	0.0018	0.5952	0.0000
Hf-183	1.0670	h	1.59	1.2322E+19	6.0097E+04	0.7528	0.4179	0.0000
W-185	75.100	d	0.40	1.6011E+22	4.6227E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	8.7657E+18	2.7645E+04	0.0970	0.4590	0.0000
Ta-186	10.500	m	2.86	8.1337E+17	2.4186E+04	1.5700	1.0570	0.0000
W-185m	1.6670	m	2.00	9.8584E+16	1.8465E+04	0.0274	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2137E+19	1.1483E+04	0.9980	0.0000	0.0000
Co-58	70.860	d	0.10	3.6973E+21	1.1313E+04	0.9770	0.0036	0.0300
Al-29	6.5600	m	0.91	1.2355E+17	5880.	1.3790	0.9765	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Ti-51	5.8000	m	0.52	9.3522E+16	5035.	0.3692	0.8684	0.0000
Al-28	2.2420	m	0.13	3.1083E+16	4329.	1.7790	1.2470	0.0000
Fe-59	44.490	d	0.02	7.7307E+20	3768.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.6925E+18	2807.	1.5620	0.4113	0.0000
Co-62m	13.910	m	0.36	1.1814E+17	2652.	2.6830	1.0620	0.0000
Mn-54	312.20	d	0.01	2.9239E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	4.2723E+19	1820.	0.2936	0.1877	0.0000
Mg-27	9.4580	m	0.13	3.3842E+16	1117.	0.8914	0.7010	0.0000
Hf-182m	1.0250	h	2.44	2.0205E+17	1026.	0.9860	0.0888	0.0000
P-32	14.270	d	0.28	5.2602E+19	799.3	0.0012	0.6949	0.0000
Fe-53	8.5100	m	0.82	1.9462E+16	714.0	1.2070	0.0000	1.1050
Ta-185	49.000	m	4.08	9.2987E+16	592.5	0.1450	0.6334	0.0000
W-181	120.90	d	0.10	3.2926E+20	590.5	0.0397	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.3847E+16	470.1	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	7.1004E+12	470.0	0.0017	0.0122	0.0000
Fe-61	5.9800	m	1.00	8.6356E+15	450.9	1.3970	1.1990	0.0000
W-179	37.050	m	0.43	2.5658E+16	216.2	0.0005	0.0000	0.0000
Cr-49	41.900	m	0.72	2.8279E+16	210.7	1.0600	0.0000	0.5970
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8228E+17	84.45	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0973E+19	77.46	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	1.7334E+13	61.85	0.1276	0.0000	0.0000
N-13	9.9670	m	0.04	1.8115E+15	56.75	1.0200	0.0000	0.4909
W-179m	6.4000	m	1.09	1.0693E+15	52.17	0.0552	0.0000	0.0000
Co-57	271.80	d	0.02	4.1363E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4170E+18	32.83	0.5180	0.1204	0.0000
V-53	1.6200	m	2.47	1.6639E+14	32.07	1.0380	1.0090	0.0000
Co-62	1.5000	m	2.67	1.4439E+14	30.06	1.5990	1.6430	0.0000
Co-60	5.2701	y	0.02	1.1802E+20	13.29	2.5030	0.0964	0.0000
Mn-57	1.4230	m	2.11	4.4497E+13	9.763	0.0976	1.0900	0.0000
Mn-52m	21.200	m	1.89	6.0061E+14	8.846	2.4200	0.0004	1.1140
S-37	4.9900	m	0.40	9.6295E+13	6.025	2.9310	0.7998	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 133
Total activity (Ci) = 2.42220E+08

Total number of decays = 6.42923E+22
Asympt number of decays = 1.75603E+24
Percent of decays = 3.6612
Average chain length = 1.5377

Average gamma E (MeV) = 1.2811
Average beta E (MeV) = 0.64814
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.9993858 R/hr per Ci/m2
Composite ECF per FGR table = 23.0566711 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 16.0132389 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 33.9551735 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	7.8561E+22	1.5833E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4193E+23	7.4605E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.4199E+21	1.9996E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	3.5586E+20	7.3486E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2675E+22	3.3392E+05	0.0328	0.0031	0.0000
Co-60m	10.470	m	0.38	6.8017E+18	2.0284E+05	0.0066	0.0536	0.0000
Si-31	2.6200	h	0.38	7.0589E+19	1.4020E+05	0.0018	0.5952	0.0000
Hf-183	1.0670	h	1.59	1.1452E+19	5.5851E+04	0.7528	0.4179	0.0000
Cr-55	3.5400	m	0.85	5.9079E+17	5.2108E+04	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	5.5588E+17	4.6345E+04	1.4450	1.0680	0.0000
W-185	75.100	d	0.40	1.6011E+22	4.6225E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	8.3646E+18	2.6380E+04	0.0970	0.4590	0.0000
Ta-186	10.500	m	2.86	5.2032E+17	1.5472E+04	1.5700	1.0570	0.0000
Co-58	70.860	d	0.10	3.7273E+21	1.1405E+04	0.9770	0.0036	0.0300
Hf-180m	5.5000	h	1.82	1.1965E+19	1.1321E+04	0.9980	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6150E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7302E+20	3767.	1.1880	0.1176	0.0000
Al-29	6.5600	m	0.91	6.0435E+16	2876.	1.3790	0.9765	0.0000
Ta-184	8.7000	h	1.15	4.6505E+18	2782.	1.5620	0.4113	0.0000
Ti-51	5.8000	m	0.52	4.1657E+16	2242.	0.3692	0.8684	0.0000
Mn-54	312.20	d	0.01	2.9238E+21	2031.	0.8359	0.0034	0.0000
Co-62m	13.910	m	0.36	8.4321E+16	1893.	2.6830	1.0620	0.0000
Ta-183	5.0900	d	1.38	4.3566E+19	1856.	0.2936	0.1877	0.0000
W-185m	1.6670	m	2.00	5.9126E+15	1107.	0.0274	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.8721E+17	950.5	0.9860	0.0888	0.0000
P-32	14.270	d	0.28	5.2590E+19	799.1	0.0012	0.6949	0.0000
Mg-27	9.4580	m	0.13	2.0610E+16	680.4	0.8914	0.7010	0.0000
W-181	120.90	d	0.10	3.2926E+20	590.5	0.0397	0.0000	0.0000
Ta-185	49.000	m	4.08	8.4498E+16	538.4	0.1450	0.6334	0.0000
Al-28	2.2420	m	0.13	3.8362E+15	534.2	1.7790	1.2470	0.0000
Ta-182n	15.840	m	0.63	2.5170E+16	496.1	0.2667	0.5060	0.0000
Ta-182m	0.28300	s	1.06	7.4945E+12	496.1	0.0017	0.0122	0.0000
Fe-53	8.5100	m	0.82	1.1245E+16	412.6	1.2070	0.0000	1.1050
Fe-61	5.9800	m	1.00	3.9413E+15	205.8	1.3970	1.1990	0.0000
W-179	37.050	m	0.43	2.3123E+16	194.9	0.0005	0.0000	0.0000
Cr-49	41.900	m	0.72	2.5284E+16	188.4	1.0600	0.0000	0.5970
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.8101E+17	84.27	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0980E+19	77.47	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	1.7677E+13	63.08	0.1276	0.0000	0.0000
N-13	9.9670	m	0.04	1.1315E+15	35.44	1.0200	0.0000	0.4909
Co-57	271.80	d	0.02	4.1364E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4165E+18	32.83	0.5180	0.1204	0.0000
W-179m	6.4000	m	1.09	5.1382E+14	25.07	0.0552	0.0000	0.0000
Co-62	1.5000	m	2.67	1.0199E+14	21.23	1.5990	1.6430	0.0000
Co-60	5.2701	y	0.02	1.2185E+20	13.73	2.5030	0.0964	0.0000
Mn-52m	21.200	m	1.89	4.8140E+14	7.090	2.4200	0.0004	1.1140
Ta-180	8.0810	h	0.62	7.3371E+15	4.725	0.0463	0.0297	0.0000
S-35	87.310	d	0.18	1.3937E+18	3.461	0.0000	0.0486	0.0000
S-37	4.9900	m	0.40	3.7615E+13	2.354	2.9310	0.7998	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 132
 Total activity (Ci) = 2.36645E+08

Total number of decays = 6.78885E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 3.8660
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2751
 Average beta E (MeV) = 0.64464
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.8922100 R/hr per Ci/m2
 Composite ECF per FGR table = 22.9692249 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.9386158 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 42.4066658 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	7.5645E+22	1.5246E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.4053E+23	7.4301E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.3826E+21	1.9778E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	3.4234E+20	7.0693E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2669E+22	3.3387E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	6.8007E+19	1.3507E+05	0.0018	0.5952	0.0000
Co-60m	10.470	m	0.38	3.8871E+18	1.1592E+05	0.0066	0.0536	0.0000
Hf-183	1.0670	h	1.59	1.0450E+19	5.0967E+04	0.7528	0.4179	0.0000
W-185	75.100	d	0.40	1.6010E+22	4.6223E+04	0.0001	0.1269	0.0000
Co-61	1.6500	h	0.30	7.8864E+18	2.4872E+04	0.0970	0.4590	0.0000
Co-58	70.860	d	0.10	3.7644E+21	1.1519E+04	0.9770	0.0036	0.0000
Hf-180m	5.5000	h	1.82	1.1755E+19	1.1122E+04	0.9980	0.0000	0.0000
Cr-55	3.5400	m	0.85	1.1291E+17	9959.	0.0033	1.1010	0.0000
V-52	3.7450	m	0.13	1.1632E+17	9697.	1.4450	1.0680	0.0000
Ta-186	10.500	m	2.86	2.9783E+17	8856.	1.5700	1.0570	0.0000
Fe-55	2.7351	y	0.80	2.6149E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7295E+20	3767.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.5986E+18	2751.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9238E+21	2031.	0.8359	0.0034	0.0000
Ta-183	5.0900	d	1.38	4.4532E+19	1897.	0.2936	0.1877	0.0000
Co-62m	13.910	m	0.36	5.5340E+16	1242.	2.6830	1.0620	0.0000
Al-29	6.5600	m	0.91	2.4744E+16	1178.	1.3790	0.9765	0.0000
Hf-182m	1.0250	h	2.44	1.7020E+17	864.1	0.9860	0.0888	0.0000
Ti-51	5.8000	m	0.52	1.5172E+16	816.7	0.3692	0.8684	0.0000
P-32	14.270	d	0.28	5.2575E+19	798.8	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2924E+20	590.5	0.0397	0.0000	0.0000
Ta-182m	0.28300	s	1.06	7.6263E+12	504.8	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	2.5611E+16	504.8	0.2667	0.5060	0.0000
Ta-185	49.000	m	4.08	7.4977E+16	477.8	0.1450	0.6334	0.0000
Mg-27	9.4580	m	0.13	1.1094E+16	366.2	0.8914	0.7010	0.0000
Fe-53	8.5100	m	0.82	5.6537E+15	207.4	1.2070	0.0000	1.1050
W-179	37.050	m	0.43	2.0022E+16	168.7	0.0005	0.0000	0.0000
Cr-49	41.900	m	0.72	2.1985E+16	163.8	1.0600	0.0000	0.5970
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.7943E+17	84.04	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.0988E+19	77.48	1.2910	0.2070	0.0000
Fe-61	5.9800	m	1.00	1.4798E+15	77.26	1.3970	1.1990	0.0000
W-183m	5.2500	s	1.33	1.8069E+13	64.48	0.1276	0.0000	0.0000
Al-28	2.2420	m	0.13	2.8128E+14	39.17	1.7790	1.2470	0.0000
Co-57	271.80	d	0.02	4.1365E+19	33.00	0.1252	0.0176	0.0000
W-185m	1.6670	m	2.00	1.7603E+14	32.97	0.0274	0.0000	0.0000
Hf-181	42.380	d	0.14	6.4159E+18	32.83	0.5180	0.1204	0.0000
N-13	9.9670	m	0.04	6.2862E+14	19.69	1.0200	0.0000	0.4909
Co-60	5.2701	y	0.02	1.2476E+20	14.05	2.5030	0.0964	0.0000
Co-62	1.5000	m	2.67	6.6891E+13	13.92	1.5990	1.6430	0.0000
W-179m	6.4000	m	1.09	2.0572E+14	10.04	0.0552	0.0000	0.0000
Mn-52m	21.200	m	1.89	3.6517E+14	5.378	2.4200	0.0004	1.1140
Ta-180	8.0810	h	0.62	7.2489E+15	4.668	0.0463	0.0297	0.0000
S-35	87.310	d	0.18	1.3937E+18	3.461	0.0000	0.0486	0.0000
V-49	330.00	d	6.06	1.3313E+18	0.8747	0.0009	0.0034	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 132
 Total activity (Ci) = 2.30225E+08

Total number of decays = 7.22677E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 4.1154
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2665
 Average beta E (MeV) = 0.64051
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.7386475 R/hr per Ci/m2
 Composite ECF per FGR table = 22.8280735 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.8313522 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 52.9617386 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	7.2156E+22	1.4542E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.3880E+23	7.3922E+07	0.4476	0.2710	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.3366E+21	1.9509E+06	0.0019	0.0208	0.0000	0.0000
Ni-65	2.5200	h	0.04	3.2617E+20	6.7354E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2661E+22	3.3381E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	6.4915E+19	1.2893E+05	0.0018	0.5952	0.0000	0.0000
Co-60m	10.470	m	0.38	1.9326E+18	5.7633E+04	0.0066	0.0536	0.0000	0.0000
W-185	75.100	d	0.40	1.6009E+22	4.6220E+04	0.0001	0.1269	0.0000	0.0000
Hf-183	1.0670	h	1.59	9.3219E+18	4.5463E+04	0.7528	0.4179	0.0000	0.0000
Co-61	1.6500	h	0.30	7.3256E+18	2.3104E+04	0.0970	0.4590	0.0000	0.0000
Co-58	70.860	d	0.10	3.8101E+21	1.1659E+04	0.9770	0.0036	0.0300	0.0000
Hf-180m	5.5000	h	1.82	1.1497E+19	1.0878E+04	0.9980	0.0000	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6149E+22	5676.	0.0016	0.0038	0.0000	0.0000
Ta-186	10.500	m	2.86	1.4838E+17	4412.	1.5700	1.0570	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7286E+20	3767.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.5346E+18	2712.	1.5620	0.4113	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9238E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.5615E+19	1943.	0.2936	0.1877	0.0000	0.0000
V-52	3.7450	m	0.13	1.6489E+16	1375.	1.4450	1.0680	0.0000	0.0000
Cr-55	3.5400	m	0.85	1.4295E+16	1261.	0.0033	1.1010	0.0000	0.0000
P-32	14.270	d	0.28	5.2556E+19	798.6	0.0012	0.6949	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.5111E+17	767.2	0.9860	0.0888	0.0000	0.0000
Co-62m	13.910	m	0.36	3.2705E+16	734.1	2.6830	1.0620	0.0000	0.0000
W-181	120.90	d	0.10	3.2923E+20	590.5	0.0397	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	7.4339E+12	492.1	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.4964E+16	492.1	0.2667	0.5060	0.0000	0.0000
Ta-185	49.000	m	4.08	6.4578E+16	411.5	0.1450	0.6334	0.0000	0.0000
Al-29	6.5600	m	0.91	8.1116E+15	386.1	1.3790	0.9765	0.0000	0.0000
Ti-51	5.8000	m	0.52	4.2975E+15	231.3	0.3692	0.8684	0.0000	0.0000
Mg-27	9.4580	m	0.13	5.1184E+15	169.0	0.8914	0.7010	0.0000	0.0000
W-179	37.050	m	0.43	1.6559E+16	139.5	0.0005	0.0000	0.0000	0.0000
Cr-49	41.900	m	0.72	1.8463E+16	137.6	1.0600	0.0000	0.5970	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Fe-53	8.5100	m	0.82	2.3935E+15	87.82	1.2070	0.0000	1.1050	0.0000
Ni-57	1.4950	d	0.84	5.7747E+17	83.75	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70	d	0.35	4.0997E+19	77.50	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.8510E+13	66.05	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1366E+19	33.00	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.4151E+18	32.82	0.5180	0.1204	0.0000	0.0000
Fe-61	5.9800	m	1.00	4.3537E+14	22.73	1.3970	1.1990	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2671E+20	14.27	2.5030	0.0964	0.0000	0.0000
N-13	9.9670	m	0.04	3.0171E+14	9.452	1.0200	0.0000	0.4909	0.0000
Co-62	1.5000	m	2.67	3.9530E+13	8.228	1.5990	1.6430	0.0000	0.0000
Ta-180	8.0810	h	0.62	7.1404E+15	4.598	0.0463	0.0297	0.0000	0.0000
Mn-52m	21.200	m	1.89	2.5859E+14	3.809	2.4200	0.0004	1.1140	0.0000
S-35	87.310	d	0.18	1.3936E+18	3.461	0.0000	0.0486	0.0000	0.0000
W-179m	6.4000	m	1.09	6.5587E+13	3.200	0.0552	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.0767E+13	1.499	1.7790	1.2470	0.0000	0.0000
V-49	330.00	d	6.06	1.3348E+18	0.8770	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 131
 Total activity (Ci) = 2.22657E+08

Total number of decays = 7.75729E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 4.4175
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2552
 Average beta E (MeV) = 0.63532
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.5360413 R/hr per Ci/m2
 Composite ECF per FGR table = 22.6366005 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.6897116 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.10240090 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	6.8023E+22	1.3710E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.3664E+23	7.3451E+07	0.4476	0.2710	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.2800E+21	1.9178E+06	0.0019	0.0208	0.0000	0.0000
Ni-65	2.5200	h	0.04	3.0704E+20	6.3404E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2651E+22	3.3374E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	6.1249E+19	1.2165E+05	0.0018	0.5952	0.0000	0.0000
W-185	75.100	d	0.40	1.6007E+22	4.6216E+04	0.0001	0.1269	0.0000	0.0000
Hf-183	1.0670	h	1.59	8.0820E+18	3.9416E+04	0.7528	0.4179	0.0000	0.0000
Co-60m	10.470	m	0.38	8.0748E+17	2.4080E+04	0.0066	0.0536	0.0000	0.0000
Co-61	1.6500	h	0.30	6.6800E+18	2.1068E+04	0.0970	0.4590	0.0000	0.0000
Co-58	70.860	d	0.10	3.8664E+21	1.1831E+04	0.9770	0.0036	0.0300	0.0000
Hf-180m	5.5000	h	1.82	1.1183E+19	1.0581E+04	0.9980	0.0000	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6149E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7275E+20	3766.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.4559E+18	2665.	1.5620	0.4113	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9237E+21	2031.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.6798E+19	1994.	0.2936	0.1877	0.0000	0.0000
Ta-186	10.500	m	2.86	6.2149E+16	1848.	1.5700	1.0570	0.0000	0.0000
P-32	14.270	d	0.28	5.2533E+19	798.2	0.0012	0.6949	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.3025E+17	661.3	0.9860	0.0888	0.0000	0.0000
W-181	120.90	d	0.10	3.2921E+20	590.4	0.0397	0.0000	0.0000	0.0000
Ta-182m	0.28300	s	1.06	6.8942E+12	456.4	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.3152E+16	456.4	0.2667	0.5060	0.0000	0.0000
Co-62m	13.910	m	0.36	1.6956E+16	380.6	2.6830	1.0620	0.0000	0.0000
Ta-185	49.000	m	4.08	5.3592E+16	341.5	0.1450	0.6334	0.0000	0.0000
V-52	3.7450	m	0.13	1.4374E+15	119.8	1.4450	1.0680	0.0000	0.0000
Cr-49	41.900	m	0.72	1.4845E+16	110.6	1.0600	0.0000	0.5970	0.0000
W-179	37.050	m	0.43	1.2983E+16	109.4	0.0005	0.0000	0.0000	0.0000
Al-29	6.5600	m	0.91	2.0146E+15	95.89	1.3790	0.9765	0.0000	0.0000
Cr-55	3.5400	m	0.85	1.0819E+15	95.43	0.0033	1.1010	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.7502E+17	83.40	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70	d	0.35	4.1009E+19	77.52	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.8990E+13	67.76	0.1276	0.0000	0.0000	0.0000
Mg-27	9.4580	m	0.13	1.9479E+15	64.30	0.8914	0.7010	0.0000	0.0000
Ti-51	5.8000	m	0.52	8.8926E+14	47.87	0.3692	0.8684	0.0000	0.0000
Co-57	271.80	d	0.02	4.1368E+19	33.00	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.4142E+18	32.82	0.5180	0.1204	0.0000	0.0000
Fe-53	8.5100	m	0.82	8.1798E+14	30.01	1.2070	0.0000	1.1050	0.0000
Co-60	5.2701	y	0.02	1.2783E+20	14.40	2.5030	0.0964	0.0000	0.0000
Fe-61	5.9800	m	1.00	9.4464E+13	4.932	1.3970	1.1990	0.0000	0.0000
Ta-180	8.0810	h	0.62	7.0071E+15	4.512	0.0463	0.0297	0.0000	0.0000
Co-62	1.5000	m	2.67	2.0495E+13	4.266	1.5990	1.6430	0.0000	0.0000
N-13	9.9670	m	0.04	1.2063E+14	3.779	1.0200	0.0000	0.4909	0.0000
S-35	87.310	d	0.18	1.3935E+18	3.461	0.0000	0.0486	0.0000	0.0000
Mn-52m	21.200	m	1.89	1.6805E+14	2.475	2.4200	0.0004	1.1140	0.0000
V-49	330.00	d	6.06	1.3384E+18	0.8794	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
W-179m	6.4000	m	1.09	1.5732E+13	0.7675	0.0552	0.0000	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 131
 Total activity (Ci) = 2.13729E+08

Total number of decays = 8.39570E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 4.7811
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2406
 Average beta E (MeV) = 0.62868
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 22.2747555 R/hr per Ci/m2
 Composite ECF per FGR table = 22.3881588 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.5069876 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.37679005 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	6.3193E+22	1.2736E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.3397E+23	7.2868E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.2106E+21	1.8772E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	2.8472E+20	5.8795E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2639E+22	3.3364E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	5.6960E+19	1.1313E+05	0.0018	0.5952	0.0000
W-185	75.100	d	0.40	1.6006E+22	4.6211E+04	0.0001	0.1269	0.0000
Hf-183	1.0670	h	1.59	6.7625E+18	3.2981E+04	0.7528	0.4179	0.0000
Co-61	1.6500	h	0.30	5.9528E+18	1.8774E+04	0.0970	0.4590	0.0000
Co-58	70.860	d	0.10	3.9353E+21	1.2042E+04	0.9770	0.0036	0.0300
Hf-180m	5.5000	h	1.82	1.0803E+19	1.0221E+04	0.9980	0.0000	0.0000
Co-60m	10.470	m	0.38	2.7151E+17	8097.	0.0066	0.0536	0.0000
Fe-55	2.7351	y	0.80	2.6149E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7261E+20	3765.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.3596E+18	2608.	1.5620	0.4113	0.0000
Ta-183	5.0900	d	1.38	4.8043E+19	2047.	0.2936	0.1877	0.0000
Mn-54	312.20	d	0.01	2.9236E+21	2030.	0.8359	0.0034	0.0000
P-32	14.270	d	0.28	5.2503E+19	797.8	0.0012	0.6949	0.0000
Ta-186	10.500	m	2.86	2.0962E+16	623.3	1.5700	1.0570	0.0000
W-181	120.90	d	0.10	3.2919E+20	590.4	0.0397	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.0819E+17	549.3	0.9860	0.0888	0.0000
Ta-182m	0.28300	s	1.06	6.0398E+12	399.8	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	2.0282E+16	399.8	0.2667	0.5060	0.0000
Ta-185	49.000	m	4.08	4.2458E+16	270.5	0.1450	0.6334	0.0000
Co-62m	13.910	m	0.36	7.4652E+15	167.6	2.6830	1.0620	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Cr-49	41.900	m	0.72	1.1306E+16	84.25	1.0600	0.0000	0.5970
Ni-57	1.4950	d	0.84	5.7198E+17	82.96	1.9200	0.0044	0.1430
W-179	37.050	m	0.43	9.5519E+15	80.50	0.0005	0.0000	0.0000
Ta-182	114.70	d	0.35	4.1022E+19	77.55	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	1.9497E+13	69.57	0.1276	0.0000	0.0000
Co-57	271.80	d	0.02	4.1369E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4130E+18	32.81	0.5180	0.1204	0.0000
Mg-27	9.4580	m	0.13	5.8286E+14	19.24	0.8914	0.7010	0.0000
Al-29	6.5600	m	0.91	3.5376E+14	16.84	1.3790	0.9765	0.0000
Co-60	5.2701	y	0.02	1.2837E+20	14.46	2.5030	0.0964	0.0000
Fe-53	8.5100	m	0.82	2.1398E+14	7.851	1.2070	0.0000	1.1050
Ti-51	5.8000	m	0.52	1.2432E+14	6.693	0.3692	0.8684	0.0000
V-52	3.7450	m	0.13	6.8269E+13	5.692	1.4450	1.0680	0.0000
Ta-180	8.0810	h	0.62	6.8441E+15	4.407	0.0463	0.0297	0.0000
Cr-55	3.5400	m	0.85	4.3073E+13	3.799	0.0033	1.1010	0.0000
S-35	87.310	d	0.18	1.3934E+18	3.460	0.0000	0.0486	0.0000
Co-62	1.5000	m	2.67	9.0232E+12	1.878	1.5990	1.6430	0.0000
Mn-52m	21.200	m	1.89	9.8099E+13	1.445	2.4200	0.0004	1.1140
N-13	9.9670	m	0.04	3.8390E+13	1.203	1.0200	0.0000	0.4909
V-49	330.00	d	6.06	1.3419E+18	0.8817	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
Fe-61	5.9800	m	1.00	1.4012E+13	0.7316	1.3970	1.1990	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
W-179m	6.4000	m	1.09	2.6449E+12	0.1290	0.0552	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 131
 Total activity (Ci) = 2.03288E+08

Total number of decays = 9.15754E+22
 Asympt number of decays = 1.75603E+24
 Percent of decays = 5.2149
 Average chain length = 1.5377

Average gamma E (MeV) = 1.2218
 Average beta E (MeV) = 0.62020
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 21.9402122 R/hr per Ci/m2
 Composite ECF per FGR table = 22.0696602 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 15.2730103 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.71947491 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	5.7639E+22	1.1617E+08	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.3066E+23	7.2146E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	3.1260E+21	1.8278E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	2.5911E+20	5.3506E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2624E+22	3.3352E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	5.2023E+19	1.0333E+05	0.0018	0.5952	0.0000
W-185	75.100	d	0.40	1.6004E+22	4.6205E+04	0.0001	0.1269	0.0000
Hf-183	1.0670	h	1.59	5.4128E+18	2.6399E+04	0.7528	0.4179	0.0000
Co-61	1.6500	h	0.30	5.1547E+18	1.6257E+04	0.0970	0.4590	0.0000
Co-58	70.860	d	0.10	4.0193E+21	1.2299E+04	0.9770	0.0036	0.0300
Hf-180m	5.5000	h	1.82	1.0346E+19	9789.	0.9980	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6149E+22	5676.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7244E+20	3765.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	4.2422E+18	2537.	1.5620	0.4113	0.0000
Ta-183	5.0900	d	1.38	4.9298E+19	2100.	0.2936	0.1877	0.0000
Co-60m	10.470	m	0.38	6.9602E+16	2076.	0.0066	0.0536	0.0000
Mn-54	312.20	d	0.01	2.9235E+21	2030.	0.8359	0.0034	0.0000
P-32	14.270	d	0.28	5.2467E+19	797.2	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2916E+20	590.3	0.0397	0.0000	0.0000
Hf-182m	1.0250	h	2.44	8.5813E+16	435.7	0.9860	0.0888	0.0000
Ta-182m	0.28300	s	1.06	4.9617E+12	328.4	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	1.6662E+16	328.4	0.2667	0.5060	0.0000
Ta-185	49.000	m	4.08	3.1742E+16	202.3	0.1450	0.6334	0.0000
Ta-186	10.500	m	2.86	5.3946E+15	160.4	1.5700	1.0570	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.6821E+17	82.41	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.1035E+19	77.57	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	2.0007E+13	71.39	0.1276	0.0000	0.0000
Co-62m	13.910	m	0.36	2.6796E+15	60.15	2.6830	1.0620	0.0000
Cr-49	41.900	m	0.72	8.0461E+15	59.96	1.0600	0.0000	0.5970
W-179	37.050	m	0.43	6.5036E+15	54.81	0.0005	0.0000	0.0000
Co-57	271.80	d	0.02	4.1372E+19	33.00	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4115E+18	32.80	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	1.2857E+20	14.48	2.5030	0.0964	0.0000
Ta-180	8.0810	h	0.62	6.6458E+15	4.280	0.0463	0.0297	0.0000
Mg-27	9.4580	m	0.13	1.2917E+14	4.264	0.8914	0.7010	0.0000
S-35	87.310	d	0.18	1.3932E+18	3.460	0.0000	0.0486	0.0000
Al-29	6.5600	m	0.91	4.0289E+13	1.918	1.3790	0.9765	0.0000
Fe-53	8.5100	m	0.82	4.0092E+13	1.471	1.2070	0.0000	1.1050
V-49	330.00	d	6.06	1.3451E+18	0.8838	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
Mn-52m	21.200	m	1.89	5.0085E+13	0.7376	2.4200	0.0004	1.1140
Co-62	1.5000	m	2.67	3.2389E+12	0.6742	1.5990	1.6430	0.0000
Ti-51	5.8000	m	0.52	1.0651E+13	0.5734	0.3692	0.8684	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
N-13	9.9670	m	0.04	9.1879E+12	0.2878	1.0200	0.0000	0.4909
V-52	3.7450	m	0.13	1.5188E+12	0.1266	1.4450	1.0680	0.0000
Co-56	77.310	d	0.25	3.0301E+16	8.4982E-02	3.5800	0.0036	0.1200
Cr-55	3.5400	m	0.85	7.6870E+11	6.7800E-02	0.0033	1.1010	0.0000
Fe-61	5.9800	m	1.00	1.2926E+12	6.7491E-02	1.3970	1.1990	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 131
 Total activity (Ci) = 1.91244E+08

Total number of decays = 1.00576E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 5.7274
 Average chain length = 1.5377

Average gamma E (MeV) = 1.1979
 Average beta E (MeV) = 0.60937
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 21.5129986 R/hr per Ci/m2
 Composite ECF per FGR table = 21.6627846 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 14.9741888 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.14745688 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	5.1383E+22	1.0356E+08	1.6910	0.8309	0.0000	0.0000
W-187	23.850	h	0.34	3.2657E+23	7.1254E+07	0.4476	0.2710	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.0236E+21	1.7679E+06	0.0019	0.0208	0.0000	0.0000
Ni-65	2.5200	h	0.04	2.3033E+20	4.7564E+05	0.5583	0.6276	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2605E+22	3.3337E+05	0.0328	0.0031	0.0000	0.0000
Si-31	2.6200	h	0.38	4.6454E+19	9.2267E+04	0.0018	0.5952	0.0000	0.0000
W-185	75.100	d	0.40	1.6001E+22	4.6197E+04	0.0001	0.1269	0.0000	0.0000
Hf-183	1.0670	h	1.59	4.0990E+18	1.9991E+04	0.7528	0.4179	0.0000	0.0000
Co-61	1.6500	h	0.30	4.3065E+18	1.3582E+04	0.0970	0.4590	0.0000	0.0000
Co-58	70.860	d	0.10	4.1211E+21	1.2610E+04	0.9770	0.0036	0.0300	0.0000
Hf-180m	5.5000	h	1.82	9.8032E+18	9275.	0.9980	0.0000	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6148E+22	5676.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7222E+20	3763.	1.1880	0.1176	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.0999E+18	2452.	1.5620	0.4113	0.0000	0.0000
Ta-183	5.0900	d	1.38	5.0491E+19	2151.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9234E+21	2030.	0.8359	0.0034	0.0000	0.0000
P-32	14.270	d	0.28	5.2422E+19	796.5	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2913E+20	590.3	0.0397	0.0000	0.0000	0.0000
Co-60m	10.470	m	0.38	1.2715E+16	379.2	0.0066	0.0536	0.0000	0.0000
Hf-182m	1.0250	h	2.44	6.4248E+16	326.2	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	3.7911E+12	251.0	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	1.2731E+16	250.9	0.2667	0.5060	0.0000	0.0000
Ta-185	49.000	m	4.08	2.2074E+16	140.7	0.1450	0.6334	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.6353E+17	81.73	1.9200	0.0044	0.1430	0.0000
Ta-182	114.70	d	0.35	4.1047E+19	77.59	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.0492E+13	73.12	0.1276	0.0000	0.0000	0.0000
Cr-49	41.900	m	0.72	5.2613E+15	39.21	1.0600	0.0000	0.5970	0.0000
W-179	37.050	m	0.43	4.0228E+15	33.90	0.0005	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1374E+19	33.01	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.4096E+18	32.79	0.5180	0.1204	0.0000	0.0000
Ta-186	10.500	m	2.86	9.9028E+14	29.45	1.5700	1.0570	0.0000	0.0000
Co-62m	13.910	m	0.36	7.4533E+14	16.73	2.6830	1.0620	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2862E+20	14.49	2.5030	0.0964	0.0000	0.0000
Ta-180	8.0810	h	0.62	6.4063E+15	4.125	0.0463	0.0297	0.0000	0.0000
S-35	87.310	d	0.18	1.3930E+18	3.459	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3478E+18	0.8856	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
Mg-27	9.4580	m	0.13	1.9671E+13	0.6494	0.8914	0.7010	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Mn-52m	21.200	m	1.89	2.1631E+13	0.3186	2.4200	0.0004	1.1140	0.0000
Co-62	1.5000	m	2.67	9.0088E+11	0.1875	1.5990	1.6430	0.0000	0.0000
Fe-53	8.5100	m	0.82	4.9511E+12	0.1817	1.2070	0.0000	1.1050	0.0000
Al-29	6.5600	m	0.91	2.6718E+12	0.1272	1.3790	0.9765	0.0000	0.0000
Co-56	77.310	d	0.25	3.0296E+16	8.4968E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.4699E+15	5.6962E-02	3.4530	0.0027	0.0716	0.0000
N-13	9.9670	m	0.04	1.5404E+12	4.8256E-02	1.0200	0.0000	0.4909	0.0000
Ti-51	5.8000	m	0.52	4.9501E+11	2.6648E-02	0.3692	0.8684	0.0000	0.0000
P-33	25.380	d	0.16	2.2043E+15	1.8831E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	3.6754E+16	1.3552E-02	0.0273	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 131
 Total activity (Ci) = 1.77601E+08

Total number of decays = 1.11082E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 6.3257
 Average chain length = 1.5377

Average gamma E (MeV) = 1.1674
 Average beta E (MeV) = 0.59555
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 20.9679680 R/hr per Ci/m2
 Composite ECF per FGR table = 21.1436729 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 14.5929546 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.68196177 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	4.4514E+22	8.9715E+07	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.2154E+23	7.0155E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	2.9003E+21	1.6958E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	1.9884E+20	4.1061E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2581E+22	3.3319E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	4.0328E+19	8.0100E+04	0.0018	0.5952	0.0000
W-185	75.100	d	0.40	1.5998E+22	4.6188E+04	0.0001	0.1269	0.0000
Hf-183	1.0670	h	1.59	2.8965E+18	1.4127E+04	0.7528	0.4179	0.0000
Co-58	70.860	d	0.10	4.2434E+21	1.2985E+04	0.9770	0.0036	0.0300
Co-61	1.6500	h	0.30	3.4404E+18	1.0850E+04	0.0970	0.4590	0.0000
Hf-180m	5.5000	h	1.82	9.1646E+18	8671.	0.9980	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6148E+22	5675.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7195E+20	3762.	1.1880	0.1176	0.0000
Ta-184	8.7000	h	1.15	3.9290E+18	2350.	1.5620	0.4113	0.0000
Ta-183	5.0900	d	1.38	5.1539E+19	2195.	0.2936	0.1877	0.0000
Mn-54	312.20	d	0.01	2.9233E+21	2030.	0.8359	0.0034	0.0000
P-32	14.270	d	0.28	5.2365E+19	795.7	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2909E+20	590.2	0.0397	0.0000	0.0000
Hf-182m	1.0250	h	2.44	4.4759E+16	227.2	0.9860	0.0888	0.0000
Ta-182m	0.28300	s	1.06	2.6675E+12	176.6	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	8.9577E+15	176.6	0.2667	0.5060	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ta-185	49.000	m	4.08	1.4024E+16	89.36	0.1450	0.6334	0.0000
Ni-57	1.4950	d	0.84	5.5774E+17	80.89	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.1057E+19	77.61	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	2.0918E+13	74.64	0.1276	0.0000	0.0000
Co-60m	10.470	m	0.38	1.5214E+15	45.37	0.0066	0.0536	0.0000
Co-57	271.80	d	0.02	4.1378E+19	33.01	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4073E+18	32.78	0.5180	0.1204	0.0000
Cr-49	41.900	m	0.72	3.0952E+15	23.06	1.0600	0.0000	0.5970
W-179	37.050	m	0.43	2.2078E+15	18.61	0.0005	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2863E+20	14.49	2.5030	0.0964	0.0000
Ta-180	8.0810	h	0.62	6.1192E+15	3.941	0.0463	0.0297	0.0000
Ta-186	10.500	m	2.86	1.1921E+14	3.545	1.5700	1.0570	0.0000
S-35	87.310	d	0.18	1.3928E+18	3.459	0.0000	0.0486	0.0000
Co-62m	13.910	m	0.36	1.5077E+14	3.384	2.6830	1.0620	0.0000
V-49	330.00	d	6.06	1.3499E+18	0.8870	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
Mn-52m	21.200	m	1.89	7.5804E+12	0.1116	2.4200	0.0004	1.1140
Co-56	77.310	d	0.25	3.0290E+16	8.4951E-02	3.5800	0.0036	0.1200
Mg-27	9.4580	m	0.13	1.8754E+12	6.1912E-02	0.8914	0.7010	0.0000
Mn-52	5.5950	d	0.05	1.4661E+15	5.6815E-02	3.4530	0.0027	0.0716
Co-62	1.5000	m	2.67	1.8223E+11	3.7932E-02	1.5990	1.6430	0.0000
P-33	25.380	d	0.16	2.2029E+15	1.8820E-02	0.0000	0.0764	0.0000
Ta-179	1.6100	y	1.70	3.8568E+16	1.4221E-02	0.0273	0.0000	0.0000
Fe-53	8.5100	m	0.82	3.6329E+11	1.3329E-02	1.2070	0.0000	1.1050
V-48	15.970	d	0.02	8.0310E+14	1.0904E-02	2.9100	0.0020	0.1449
N-13	9.9670	m	0.04	1.6559E+11	5.1873E-03	1.0200	0.0000	0.4909
Al-29	6.5600	m	0.91	9.0187E+10	4.2925E-03	1.3790	0.9765	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 129
 Total activity (Ci) = 1.62501E+08

Total number of decays = 1.23177E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 7.0145
 Average chain length = 1.5377

Average gamma E (MeV) = 1.1286
 Average beta E (MeV) = 0.57795
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 20.2737522 R/hr per Ci/m2
 Composite ECF per FGR table = 20.4824677 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 14.1073532 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.34950924 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Mn-56	2.5820	h	0.19	3.7211E+22	7.4996E+07	1.6910	0.8309	0.0000
W-187	23.850	h	0.34	3.1536E+23	6.8808E+07	0.4476	0.2710	0.0000
Co-58m	8.9000	h	1.12	2.7534E+21	1.6099E+06	0.0019	0.0208	0.0000
Ni-65	2.5200	h	0.04	1.6549E+20	3.4173E+05	0.5583	0.6276	0.0000
Cr-51	27.710	d	0.01	4.2551E+22	3.3295E+05	0.0328	0.0031	0.0000
Si-31	2.6200	h	0.38	3.3800E+19	6.7132E+04	0.0018	0.5952	0.0000
W-185	75.100	d	0.40	1.5994E+22	4.6176E+04	0.0001	0.1269	0.0000
Co-58	70.860	d	0.10	4.3892E+21	1.3431E+04	0.9770	0.0036	0.0300
Hf-183	1.0670	h	1.59	1.8774E+18	9156.	0.7528	0.4179	0.0000
Co-61	1.6500	h	0.30	2.5991E+18	8197.	0.0970	0.4590	0.0000
Hf-180m	5.5000	h	1.82	8.4251E+18	7971.	0.9980	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6147E+22	5675.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7162E+20	3761.	1.1880	0.1176	0.0000
Ta-183	5.0900	d	1.38	5.2361E+19	2230.	0.2936	0.1877	0.0000
Ta-184	8.7000	h	1.15	3.7255E+18	2228.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9231E+21	2030.	0.8359	0.0034	0.0000
P-32	14.270	d	0.28	5.2294E+19	794.6	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2904E+20	590.1	0.0397	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.8499E+16	144.7	0.9860	0.0888	0.0000
Ta-182m	0.28300	s	1.06	1.7051E+12	112.9	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	5.7259E+15	112.9	0.2667	0.5060	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ni-57	1.4950	d	0.84	5.5059E+17	79.85	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.1062E+19	77.62	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	2.1252E+13	75.83	0.1276	0.0000	0.0000
Ta-185	49.000	m	4.08	7.9578E+15	50.71	0.1450	0.6334	0.0000
Co-57	271.80	d	0.02	4.1382E+19	33.01	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4044E+18	32.77	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	1.2863E+20	14.49	2.5030	0.0964	0.0000
Cr-49	41.900	m	0.72	1.5956E+15	11.89	1.0600	0.0000	0.5970
W-179	37.050	m	0.43	1.0436E+15	8.795	0.0005	0.0000	0.0000
Ta-180	8.0810	h	0.62	5.7787E+15	3.721	0.0463	0.0297	0.0000
S-35	87.310	d	0.18	1.3925E+18	3.458	0.0000	0.0486	0.0000
Co-60m	10.470	m	0.38	1.0731E+14	3.200	0.0066	0.0536	0.0000
V-49	330.00	d	6.06	1.3514E+18	0.8879	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
Co-62m	13.910	m	0.36	2.0489E+13	0.4599	2.6830	1.0620	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
Ta-186	10.500	m	2.86	8.4727E+12	0.2519	1.5700	1.0570	0.0000
Co-56	77.310	d	0.25	3.0282E+16	8.4930E-02	3.5800	0.0036	0.1200
Mn-52	5.5950	d	0.05	1.4611E+15	5.6623E-02	3.4530	0.0027	0.0716
Mn-52m	21.200	m	1.89	2.0463E+12	3.0137E-02	2.4200	0.0004	1.1140
P-33	25.380	d	0.16	2.2013E+15	1.8806E-02	0.0000	0.0764	0.0000
Ta-179	1.6100	y	1.70	3.9731E+16	1.4649E-02	0.0273	0.0000	0.0000
V-48	15.970	d	0.02	8.0213E+14	1.0891E-02	2.9100	0.0020	0.1449
Co-62	1.5000	m	2.67	2.4765E+10	5.1548E-03	1.5990	1.6430	0.0000
Mg-27	9.4580	m	0.13	9.9608E+10	3.2883E-03	0.8914	0.7010	0.0000
Al-28	2.2420	m	0.13	3.9204E+09	5.4596E-04	1.7790	1.2470	0.0000
Mg-28	20.900	h	0.14	2.1888E+12	5.4499E-04	1.3710	0.1524	0.0000
Fe-53	8.5100	m	0.82	1.3914E+10	5.1048E-04	1.2070	0.0000	1.1050

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 129
Total activity (Ci) = 1.46258E+08

Total number of decays = 1.36884E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 7.7951
Average chain length = 1.5377

Average gamma E (MeV) = 1.0793
Average beta E (MeV) = 0.55564
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 19.3935108 R/hr per Ci/m2
Composite ECF per FGR table = 19.6440907 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.4916115 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 4.18320704 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	3.0781E+23	6.7160E+07	0.4476	0.2710	0.0000
Mn-56	2.5820	h	0.19	2.9749E+22	5.9957E+07	1.6910	0.8309	0.0000
Co-58m	8.9000	h	1.12	2.5803E+21	1.5087E+06	0.0019	0.0208	0.0000
Cr-51	27.710	d	0.01	4.2514E+22	3.3267E+05	0.0328	0.0031	0.0000
Ni-65	2.5200	h	0.04	1.3158E+20	2.7170E+05	0.5583	0.6276	0.0000
Si-31	2.6200	h	0.38	2.7110E+19	5.3845E+04	0.0018	0.5952	0.0000
W-185	75.100	d	0.40	1.5989E+22	4.6161E+04	0.0001	0.1269	0.0000
Co-58	70.860	d	0.10	4.5608E+21	1.3956E+04	0.9770	0.0036	0.0000
Hf-180m	5.5000	h	1.82	7.5848E+18	7176.	0.9980	0.0000	0.0000
Co-61	1.6500	h	0.30	1.8311E+18	5775.	0.0970	0.4590	0.0000
Fe-55	2.7351	y	0.80	2.6147E+22	5675.	0.0016	0.0038	0.0000
Hf-183	1.0670	h	1.59	1.0923E+18	5327.	0.7528	0.4179	0.0000
Fe-59	44.490	d	0.02	7.7120E+20	3759.	1.1880	0.1176	0.0000
Ta-183	5.0900	d	1.38	5.2897E+19	2253.	0.2936	0.1877	0.0000
Ta-184	8.7000	h	1.15	3.4861E+18	2085.	1.5620	0.4113	0.0000
Mn-54	312.20	d	0.01	2.9229E+21	2030.	0.8359	0.0034	0.0000
P-32	14.270	d	0.28	5.2206E+19	793.2	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2897E+20	590.0	0.0397	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Hf-182m	1.0250	h	2.44	1.6218E+16	82.33	0.9860	0.0888	0.0000
Ni-57	1.4950	d	0.84	5.4180E+17	78.58	1.9200	0.0044	0.1430
Ta-182	114.70	d	0.35	4.1063E+19	77.62	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	2.1470E+13	76.61	0.1276	0.0000	0.0000
Ta-182m	0.28300	s	1.06	9.7145E+11	64.31	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	3.2622E+15	64.30	0.2667	0.5060	0.0000
Co-57	271.80	d	0.02	4.1387E+19	33.02	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.4007E+18	32.75	0.5180	0.1204	0.0000
Ta-185	49.000	m	4.08	3.9218E+15	24.99	0.1450	0.6334	0.0000
Co-60	5.2701	y	0.02	1.2863E+20	14.49	2.5030	0.0964	0.0000
Cr-49	41.900	m	0.72	6.9750E+14	5.198	1.0600	0.0000	0.5970
Ta-180	8.0810	h	0.62	5.3799E+15	3.464	0.0463	0.0297	0.0000
S-35	87.310	d	0.18	1.3921E+18	3.457	0.0000	0.0486	0.0000
W-179	37.050	m	0.43	4.0937E+14	3.450	0.0005	0.0000	0.0000
V-49	330.00	d	6.06	1.3522E+18	0.8884	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
Co-60m	10.470	m	0.38	3.9123E+12	0.1167	0.0066	0.0536	0.0000
Co-56	77.310	d	0.25	3.0273E+16	8.4903E-02	3.5800	0.0036	0.1200
Mn-52	5.5950	d	0.05	1.4549E+15	5.6381E-02	3.4530	0.0027	0.0716
Co-62m	13.910	m	0.36	1.6942E+12	3.8030E-02	2.6830	1.0620	0.0000
P-33	25.380	d	0.16	2.1992E+15	1.8788E-02	0.0000	0.0764	0.0000
Ta-179	1.6100	y	1.70	4.0363E+16	1.4883E-02	0.0273	0.0000	0.0000
V-48	15.970	d	0.02	8.0092E+14	1.0874E-02	2.9100	0.0020	0.1449
Ta-186	10.500	m	2.86	3.1183E+11	9.2726E-03	1.5700	1.0570	0.0000
Mn-52m	21.200	m	1.89	3.9873E+11	5.8724E-03	2.4200	0.0004	1.1140
Al-28	2.2420	m	0.13	3.8135E+09	5.3108E-04	1.7790	1.2470	0.0000
Mg-28	20.900	h	0.14	2.1291E+12	5.3013E-04	1.3710	0.1524	0.0000
Co-62	1.5000	m	2.67	2.0478E+09	4.2626E-04	1.5990	1.6430	0.0000
Mg-27	9.4580	m	0.13	2.5480E+09	8.4114E-05	0.8914	0.7010	0.0000
H-3	12.330	y	0.16	2.6479E+14	1.2749E-05	0.0000	0.0057	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 127
Total activity (Ci) = 1.29380E+08

Total number of decays = 1.52157E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 8.6648
Average chain length = 1.5377

Average gamma E (MeV) = 1.0175
Average beta E (MeV) = 0.52765
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 18.2893505 R/hr per Ci/m2
Composite ECF per FGR table = 18.5924835 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.7192192 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 5.22441292 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (MeV)			
					gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.9863E+23	6.5159E+07	0.4476	0.2710	0.0000
Mn-56	2.5820	h	0.19	2.2495E+22	4.5336E+07	1.6910	0.8309	0.0000
Co-58m	8.9000	h	1.12	2.3793E+21	1.3912E+06	0.0019	0.0208	0.0000
Cr-51	27.710	d	0.01	4.2468E+22	3.3230E+05	0.0328	0.0031	0.0000
Ni-65	2.5200	h	0.04	9.8809E+19	2.0404E+05	0.5583	0.6276	0.0000
W-185	75.100	d	0.40	1.5982E+22	4.6143E+04	0.0001	0.1269	0.0000
Si-31	2.6200	h	0.38	2.0582E+19	4.0880E+04	0.0018	0.5952	0.0000
Co-58	70.860	d	0.10	4.7598E+21	1.4564E+04	0.9770	0.0036	0.0000
Hf-180m	5.5000	h	1.82	6.6521E+18	6294.	0.9980	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6146E+22	5675.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	7.7068E+20	3756.	1.1880	0.1176	0.0000
Co-61	1.6500	h	0.30	1.1824E+18	3729.	0.0970	0.4590	0.0000
Hf-183	1.0670	h	1.59	5.5537E+17	2709.	0.7528	0.4179	0.0000
Ta-183	5.0900	d	1.38	5.3120E+19	2263.	0.2936	0.1877	0.0000
Mn-54	312.20	d	0.01	2.9226E+21	2030.	0.8359	0.0034	0.0000
Ta-184	8.7000	h	1.15	3.2086E+18	1919.	1.5620	0.4113	0.0000
P-32	14.270	d	0.28	5.2096E+19	791.6	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2889E+20	589.8	0.0397	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ta-182	114.70	d	0.35	4.1059E+19	77.62	1.2910	0.2070	0.0000
Ni-57	1.4950	d	0.84	5.3101E+17	77.01	1.9200	0.0044	0.1430
W-183m	5.2500	s	1.33	2.1561E+13	76.94	0.1276	0.0000	0.0000
Hf-182m	1.0250	h	2.44	8.0204E+15	40.72	0.9860	0.0888	0.0000
Co-57	271.80	d	0.02	4.1393E+19	33.02	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.3962E+18	32.72	0.5180	0.1204	0.0000
Ta-182m	0.28300	s	1.06	4.8055E+11	31.81	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	1.6137E+15	31.81	0.2667	0.5060	0.0000
Co-60	5.2701	y	0.02	1.2863E+20	14.49	2.5030	0.0964	0.0000
Ta-185	49.000	m	4.08	1.6207E+15	10.33	0.1450	0.6334	0.0000
S-35	87.310	d	0.18	1.3916E+18	3.456	0.0000	0.0486	0.0000
Ta-180	8.0810	h	0.62	4.9202E+15	3.168	0.0463	0.0297	0.0000
Cr-49	41.900	m	0.72	2.4815E+14	1.849	1.0600	0.0000	0.5970
W-179	37.050	m	0.43	1.2721E+14	1.072	0.0005	0.0000	0.0000
V-49	330.00	d	6.06	1.3525E+18	0.8886	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
Co-56	77.310	d	0.25	3.0261E+16	8.4870E-02	3.5800	0.0036	0.1200
Mn-52	5.5950	d	0.05	1.4471E+15	5.6079E-02	3.4530	0.0027	0.0716
P-33	25.380	d	0.16	2.1966E+15	1.8766E-02	0.0000	0.0764	0.0000
Ta-179	1.6100	y	1.70	4.0644E+16	1.4986E-02	0.0273	0.0000	0.0000
V-48	15.970	d	0.02	7.9941E+14	1.0854E-02	2.9100	0.0020	0.1449
Co-60m	10.470	m	0.38	6.2553E+10	1.8654E-03	0.0066	0.0536	0.0000
Co-62m	13.910	m	0.36	7.5335E+10	1.6910E-03	2.6830	1.0620	0.0000
Mn-52m	21.200	m	1.89	5.1713E+10	7.6161E-04	2.4200	0.0004	1.1140
Al-28	2.2420	m	0.13	3.6840E+09	5.1305E-04	1.7790	1.2470	0.0000
Mg-28	20.900	h	0.14	2.0569E+12	5.1213E-04	1.3710	0.1524	0.0000
Ta-186	10.500	m	2.86	5.0451E+09	1.5002E-04	1.5700	1.0570	0.0000
Co-62	1.5000	m	2.67	9.1058E+07	1.8954E-05	1.5990	1.6430	0.0000
H-3	12.330	y	0.16	2.6479E+14	1.2749E-05	0.0000	0.0057	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 127
 Total activity (Ci) = 1.12554E+08

Total number of decays = 1.68886E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 9.6175
 Average chain length = 1.5377

Average gamma E (MeV) = 0.94167
 Average beta E (MeV) = 0.49329
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 16.9337616 R/hr per Ci/m2
 Composite ECF per FGR table = 17.3014717 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 11.7709103 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 6.52478266 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.8756E+23	6.2742E+07	0.4476	0.2710	0.0000
Mn-56	2.5820	h	0.19	1.5866E+22	3.1977E+07	1.6910	0.8309	0.0000
Co-58m	8.9000	h	1.12	2.1501E+21	1.2572E+06	0.0019	0.0208	0.0000
Cr-51	27.710	d	0.01	4.2411E+22	3.3185E+05	0.0328	0.0031	0.0000
Ni-65	2.5200	h	0.04	6.9097E+19	1.4269E+05	0.5583	0.6276	0.0000
W-185	75.100	d	0.40	1.5974E+22	4.6120E+04	0.0001	0.1269	0.0000
Si-31	2.6200	h	0.38	1.4591E+19	2.8980E+04	0.0018	0.5952	0.0000
Co-58	70.860	d	0.10	4.9863E+21	1.5258E+04	0.9770	0.0036	0.0000
Fe-55	2.7351	y	0.80	2.6145E+22	5675.	0.0016	0.0038	0.0000
Hf-180m	5.5000	h	1.82	5.6466E+18	5342.	0.9980	0.0000	0.0000
Fe-59	44.490	d	0.02	7.7003E+20	3753.	1.1880	0.1176	0.0000
Ta-183	5.0900	d	1.38	5.3045E+19	2260.	0.2936	0.1877	0.0000
Co-61	1.6500	h	0.30	6.8472E+17	2159.	0.0970	0.4590	0.0000
Mn-54	312.20	d	0.01	2.9222E+21	2030.	0.8359	0.0034	0.0000
Ta-184	8.7000	h	1.15	2.8928E+18	1730.	1.5620	0.4113	0.0000
Hf-183	1.0670	h	1.59	2.3862E+17	1164.	0.7528	0.4179	0.0000
P-32	14.270	d	0.28	5.1959E+19	789.5	0.0012	0.6949	0.0000
W-181	120.90	d	0.10	3.2879E+20	589.7	0.0397	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000
Ta-182	114.70	d	0.35	4.1049E+19	77.60	1.2910	0.2070	0.0000
W-183m	5.2500	s	1.33	2.1531E+13	76.83	0.1276	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.1784E+17	75.10	1.9200	0.0044	0.1430
Co-57	271.80	d	0.02	4.1401E+19	33.03	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	6.3905E+18	32.70	0.5180	0.1204	0.0000
Hf-182m	1.0250	h	2.44	3.3288E+15	16.90	0.9860	0.0888	0.0000
Co-60	5.2701	y	0.02	1.2863E+20	14.49	2.5030	0.0964	0.0000
Ta-182m	0.28300	s	1.06	1.9946E+11	13.20	0.0017	0.0122	0.0000
Ta-182n	15.840	m	0.63	6.6979E+14	13.20	0.2667	0.5060	0.0000
S-35	87.310	d	0.18	1.3910E+18	3.454	0.0000	0.0486	0.0000
Ta-185	49.000	m	4.08	5.3748E+14	3.425	0.1450	0.6334	0.0000
Ta-180	8.0810	h	0.62	4.4009E+15	2.834	0.0463	0.0297	0.0000
V-49	330.00	d	6.06	1.3525E+18	0.8887	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
Cr-49	41.900	m	0.72	6.8259E+13	0.5087	1.0600	0.0000	0.5970
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000
W-179	37.050	m	0.43	2.9553E+13	0.2490	0.0005	0.0000	0.0000
Co-56	77.310	d	0.25	3.0246E+16	8.4829E-02	3.5800	0.0036	0.1200
Mn-52	5.5950	d	0.05	1.4374E+15	5.5704E-02	3.4530	0.0027	0.0716
P-33	25.380	d	0.16	2.1933E+15	1.8738E-02	0.0000	0.0764	0.0000
Ta-179	1.6100	y	1.70	4.0739E+16	1.5021E-02	0.0273	0.0000	0.0000
V-48	15.970	d	0.02	7.9753E+14	1.0828E-02	2.9100	0.0020	0.1449
Al-28	2.2420	m	0.13	3.5285E+09	4.9139E-04	1.7790	1.2470	0.0000
Mg-28	20.900	h	0.14	1.9701E+12	4.9052E-04	1.3710	0.1524	0.0000
Mn-52m	21.200	m	1.89	4.0339E+09	5.9410E-05	2.4200	0.0004	1.1140
Co-62m	13.910	m	0.36	1.5435E+09	3.4645E-05	2.6830	1.0620	0.0000
H-3	12.330	y	0.16	2.6479E+14	1.2748E-05	0.0000	0.0057	0.0000
Co-60m	10.470	m	0.38	3.5730E+08	1.0655E-05	0.0066	0.0536	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000
Ta-186	10.500	m	2.86	2.9242E+07	8.6954E-07	1.5700	1.0570	0.0000
Re-187	0.43511E+11	y	2.99	6.0042E+22	8.1919E-07	0.0000	0.0007	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 126
Total activity (Ci) = 9.65670E+07

Total number of decays = 1.86927E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 10.645
Average chain length = 1.5377

Average gamma E (MeV) = 0.85206
Average beta E (MeV) = 0.45271
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 15.3325224 R/hr per Ci/m2
Composite ECF per FGR table = 15.7766180 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.6507187 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 8.14881039 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.7430E+23	5.9849E+07	0.4476	0.2710	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.0260E+22	2.0677E+07	1.6910	0.8309	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.8947E+21	1.1078E+06	0.0019	0.0208	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2339E+22	3.3129E+05	0.0328	0.0031	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.4204E+19	9.1281E+04	0.5583	0.6276	0.0000	0.0000
W-185	75.100	d	0.40	1.5964E+22	4.6091E+04	0.0001	0.1269	0.0000	0.0000
Si-31	2.6200	h	0.38	9.4948E+18	1.8859E+04	0.0018	0.5952	0.0000	0.0000
Co-58	70.860	d	0.10	5.2384E+21	1.6029E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6144E+22	5675.	0.0016	0.0038	0.0000	0.0000
Hf-180m	5.5000	h	1.82	4.6015E+18	4354.	0.9980	0.0000	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6922E+20	3749.	1.1880	0.1176	0.0000	0.0000
Ta-183	5.0900	d	1.38	5.2713E+19	2246.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9218E+21	2029.	0.8359	0.0034	0.0000	0.0000
Ta-184	8.7000	h	1.15	2.5417E+18	1520.	1.5620	0.4113	0.0000	0.0000
Co-61	1.6500	h	0.30	3.4612E+17	1092.	0.0970	0.4590	0.0000	0.0000
P-32	14.270	d	0.28	5.1789E+19	786.9	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2866E+20	589.4	0.0397	0.0000	0.0000	0.0000
Hf-183	1.0670	h	1.59	8.3087E+16	405.2	0.7528	0.4179	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.1034E+19	77.57	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.1396E+13	76.35	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.0184E+17	72.78	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1410E+19	33.03	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3835E+18	32.66	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2862E+20	14.49	2.5030	0.0964	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.1100E+15	5.636	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	6.6511E+10	4.403	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.2335E+14	4.403	0.2667	0.5060	0.0000	0.0000
S-35	87.310	d	0.18	1.3902E+18	3.453	0.0000	0.0486	0.0000	0.0000
Ta-180	8.0810	h	0.62	3.8287E+15	2.465	0.0463	0.0297	0.0000	0.0000
V-49	330.00	d	6.06	1.3524E+18	0.8886	0.0009	0.0034	0.0000	0.0000
Ta-185	49.000	m	4.08	1.3544E+14	0.8630	0.1450	0.6334	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Cr-49	41.900	m	0.72	1.3617E+13	0.1015	1.0600	0.0000	0.5970	0.0000
Co-56	77.310	d	0.25	3.0228E+16	8.4778E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.4254E+15	5.5239E-02	3.4530	0.0027	0.0716	0.0000
W-179	37.050	m	0.43	4.7741E+12	4.0232E-02	0.0005	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	2.1893E+15	1.8703E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0760E+16	1.5029E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.9519E+14	1.0796E-02	2.9100	0.0020	0.1449	0.0000
Al-28	2.2420	m	0.13	3.3435E+09	4.6563E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.8668E+12	4.6479E-04	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6479E+14	1.2748E-05	0.0000	0.0057	0.0000	0.0000
Mn-52m	21.200	m	1.89	1.6676E+08	2.4560E-06	2.4200	0.0004	1.1140	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	7.3299E+22	1.0001E-06	0.0000	0.0007	0.0000	0.0000
Co-62m	13.910	m	0.36	1.2015E+07	2.6970E-07	2.6830	1.0620	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8932E+17	2.5682E-08	0.2389	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 123
 Total activity (Ci) = 8.21610E+07

Total number of decays = 2.06167E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 11.740
 Average chain length = 1.5377

Average gamma E (MeV) = 0.75277
 Average beta E (MeV) = 0.40776
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 13.5584850 R/hr per Ci/m2
 Composite ECF per FGR table = 14.0873728 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 9.40956783 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 10.1770706 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.5860E+23	5.6423E+07	0.4476	0.2710	0.0000	0.0000
Mn-56	2.5820	h	0.19	5.9520E+21	1.1996E+07	1.6910	0.8309	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.6178E+21	9.4593E+05	0.0019	0.0208	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2249E+22	3.3059E+05	0.0328	0.0031	0.0000	0.0000
Ni-65	2.5200	h	0.04	2.5303E+19	5.2250E+04	0.5583	0.6276	0.0000	0.0000
W-185	75.100	d	0.40	1.5952E+22	4.6055E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.5108E+21	1.6863E+04	0.9770	0.0036	0.0300	0.0000
Si-31	2.6200	h	0.38	5.5520E+18	1.1027E+04	0.0018	0.5952	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6142E+22	5674.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6821E+20	3744.	1.1880	0.1176	0.0000	0.0000
Hf-180m	5.5000	h	1.82	3.5636E+18	3372.	0.9980	0.0000	0.0000	0.0000
Ta-183	5.0900	d	1.38	5.2171E+19	2222.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9212E+21	2029.	0.8359	0.0034	0.0000	0.0000
Ta-184	8.7000	h	1.15	2.1624E+18	1293.	1.5620	0.4113	0.0000	0.0000
P-32	14.270	d	0.28	5.1577E+19	783.7	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2850E+20	589.1	0.0397	0.0000	0.0000	0.0000
Co-61	1.6500	h	0.30	1.4763E+17	465.6	0.0970	0.4590	0.0000	0.0000
Hf-183	1.0670	h	1.59	2.2249E+16	108.5	0.7528	0.4179	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.1014E+19	77.53	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.1176E+13	75.56	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	4.8256E+17	69.99	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1420E+19	33.04	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3746E+18	32.61	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2862E+20	14.49	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3893E+18	3.450	0.0000	0.0486	0.0000	0.0000
Ta-180	8.0810	h	0.62	3.2173E+15	2.072	0.0463	0.0297	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.8162E+14	1.430	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.6874E+10	1.117	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	5.6664E+13	1.117	0.2667	0.5060	0.0000	0.0000
V-49	330.00	d	0.06	1.3521E+18	0.8884	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Ta-185	49.000	m	4.08	2.4216E+13	0.1543	0.1450	0.6334	0.0000	0.0000
Co-56	77.310	d	0.25	3.0205E+16	8.4713E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.4106E+15	5.4664E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1842E+15	1.8660E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0760E+16	1.5029E-02	0.0273	0.0000	0.0000	0.0000
Cr-49	41.900	m	0.72	1.8188E+12	1.3553E-02	1.0600	0.0000	0.5970	0.0000
V-48	15.970	d	0.02	7.9228E+14	1.0757E-02	2.9100	0.0020	0.1449	0.0000
W-179	37.050	m	0.43	4.8991E+11	4.1286E-03	0.0005	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	3.1260E+09	4.3534E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.7453E+12	4.3456E-04	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6478E+14	1.2748E-05	0.0000	0.0057	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	8.9001E+22	1.2143E-06	0.0000	0.0007	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Mn-52m	21.200	m	1.89	3.1194E+06	4.5942E-08	2.4200	0.0004	1.1140	0.0000
Hf-182	0.89992E+07	y	22.22	3.8967E+17	2.5705E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0130E+11	2.2545E-09	0.0000	0.0686	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 122
 Total activity (Ci) = 6.98426E+07

Total number of decays = 2.26588E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 12.903
 Average chain length = 1.5377

Average gamma E (MeV) = 0.65305
 Average beta E (MeV) = 0.36263
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 11.7770748 R/hr per Ci/m2
 Composite ECF per FGR table = 12.3913345 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 8.16314602 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 12.7101564 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.4025E+23	5.2419E+07	0.4476	0.2710	0.0000	0.0000
Mn-56	2.5820	h	0.19	3.0153E+21	6.0771E+06	1.6910	0.8309	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.3282E+21	7.7657E+05	0.0019	0.0208	0.0000	0.0000
Cr-51	27.710	d	0.01	4.2138E+22	3.2972E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5936E+22	4.6010E+04	0.0001	0.1269	0.0000	0.0000
Ni-65	2.5200	h	0.04	1.2606E+19	2.6031E+04	0.5583	0.6276	0.0000	0.0000
Co-58	70.860	d	0.10	5.7946E+21	1.7731E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6140E+22	5674.	0.0016	0.0038	0.0000	0.0000
Si-31	2.6200	h	0.38	2.8406E+18	5642.	0.0018	0.5952	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6695E+20	3738.	1.1880	0.1176	0.0000	0.0000
Hf-180m	5.5000	h	1.82	2.5897E+18	2450.	0.9980	0.0000	0.0000	0.0000
Ta-183	5.0900	d	1.38	5.1444E+19	2191.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9206E+21	2028.	0.8359	0.0034	0.0000	0.0000
Ta-184	8.7000	h	1.15	1.7672E+18	1057.	1.5620	0.4113	0.0000	0.0000
P-32	14.270	d	0.28	5.1313E+19	779.7	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2830E+20	588.8	0.0397	0.0000	0.0000	0.0000
Co-61	1.6500	h	0.30	5.0938E+16	160.6	0.0970	0.4590	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0988E+19	77.48	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.0881E+13	74.51	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	4.5951E+17	66.64	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1432E+19	33.05	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3636E+18	32.56	0.5180	0.1204	0.0000	0.0000
Hf-183	1.0670	h	1.59	4.2919E+15	20.93	0.7528	0.4179	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2861E+20	14.49	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3882E+18	3.447	0.0000	0.0486	0.0000	0.0000
Ta-180	8.0810	h	0.62	2.5890E+15	1.667	0.0463	0.0297	0.0000	0.0000
V-49	330.00	d	6.06	1.3518E+18	0.8882	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Hf-182m	1.0250	h	2.44	5.0784E+13	0.2578	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	3.0429E+09	0.2014	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	1.0218E+13	0.2014	0.2667	0.5060	0.0000	0.0000
Co-56	77.310	d	0.25	3.0176E+16	8.4633E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.3922E+15	5.3954E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1779E+15	1.8606E-02	0.0000	0.0764	0.0000	0.0000
Ta-185	49.000	m	4.08	2.8209E+12	1.7975E-02	0.1450	0.6334	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0756E+16	1.5027E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.8866E+14	1.0708E-02	2.9100	0.0020	0.1449	0.0000
Cr-49	41.900	m	0.72	1.4718E+11	1.0967E-03	1.0600	0.0000	0.5970	0.0000
Al-28	2.2420	m	0.13	2.8741E+09	4.0026E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.6047E+12	3.9954E-04	1.3710	0.1524	0.0000	0.0000
W-179	37.050	m	0.43	2.8526E+10	2.4039E-04	0.0005	0.0000	0.0000	0.0000
H-3	12.330	y	0.16	2.6478E+14	1.2748E-05	0.0000	0.0057	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	1.0735E+23	1.4647E-06	0.0000	0.0007	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8977E+17	2.5712E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0130E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 120
Total activity (Ci) = 5.97168E+07

Total number of decays = 2.48323E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 14.141
Average chain length = 1.5377

Average gamma E (MeV) = 0.56591
Average beta E (MeV) = 0.32320
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 10.2205725 R/hr per Ci/m2
Composite ECF per FGR table = 10.9097090 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.07391024 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 15.8737326 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.1914E+23	4.7814E+07	0.4476	0.2710	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.2897E+21	2.5993E+06	1.6910	0.8309	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.0381E+21	6.0699E+05	0.0019	0.0208	0.0000	0.0000
Cr-51	27.710	d	0.01	4.1999E+22	3.2864E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5917E+22	4.5954E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.0770E+21	1.8595E+04	0.9770	0.0036	0.0300	0.0000
Ni-65	2.5200	h	0.04	5.2804E+18	1.0904E+04	0.5583	0.6276	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6138E+22	5673.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6537E+20	3730.	1.1880	0.1176	0.0000	0.0000
Si-31	2.6200	h	0.38	1.2300E+18	2443.	0.0018	0.5952	0.0000	0.0000
Ta-183	5.0900	d	1.38	5.0532E+19	2153.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9197E+21	2028.	0.8359	0.0034	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.7382E+18	1645.	0.9980	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	1.3735E+18	821.6	1.5620	0.4113	0.0000	0.0000
P-32	14.270	d	0.28	5.0985E+19	774.7	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2805E+20	588.3	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0955E+19	77.42	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.0511E+13	73.19	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	4.3227E+17	62.69	1.9200	0.0044	0.1430	0.0000
Co-61	1.6500	h	0.30	1.3486E+16	42.53	0.0970	0.4590	0.0000	0.0000
Co-57	271.80	d	0.02	4.1445E+19	33.06	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3499E+18	32.49	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2861E+20	14.49	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3867E+18	3.444	0.0000	0.0486	0.0000	0.0000
Hf-183	1.0670	h	1.59	5.4969E+14	2.681	0.7528	0.4179	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.9737E+15	1.271	0.0463	0.0297	0.0000	0.0000
V-49	330.00	d	6.06	1.3515E+18	0.8880	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	3.0141E+16	8.4533E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.3697E+15	5.3080E-02	3.4530	0.0027	0.0716	0.0000
Hf-182m	1.0250	h	2.44	5.9789E+12	3.0354E-02	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	3.5825E+08	2.3715E-02	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	1.2030E+12	2.3713E-02	0.2667	0.5060	0.0000	0.0000
P-33	25.380	d	0.16	2.1701E+15	1.8540E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0749E+16	1.5025E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.8416E+14	1.0647E-02	2.9100	0.0020	0.1449	0.0000
Ta-185	49.000	m	4.08	1.9243E+11	1.2261E-03	0.1450	0.6334	0.0000	0.0000
Al-28	2.2420	m	0.13	2.5878E+09	3.6039E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.4448E+12	3.5975E-04	1.3710	0.1524	0.0000	0.0000
Cr-49	41.900	m	0.72	6.3697E+09	4.7465E-05	1.0600	0.0000	0.5970	0.0000
H-3	12.330	y	0.16	2.6477E+14	1.2748E-05	0.0000	0.0057	0.0000	0.0000
W-179	37.050	m	0.43	8.1847E+08	6.8974E-06	0.0005	0.0000	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	1.2846E+23	1.7526E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0130E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 120
Total activity (Ci) = 5.14450E+07

Total number of decays = 2.71625E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 15.468
Average chain length = 1.5377

Average gamma E (MeV) = 0.50235
Average beta E (MeV) = 0.29444
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 9.08558464 R/hr per Ci/m2
Composite ECF per FGR table = 9.82958508 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.27936745 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 19.8247452 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.9537E+23	4.2627E+07	0.4476	0.2710	0.0000	0.0000
Mn-56	2.5820	h	0.19	4.4654E+20	8.9996E+05	1.6910	0.8309	0.0000	0.0000
Co-58m	8.9000	h	1.12	7.6315E+20	4.4621E+05	0.0019	0.0208	0.0000	0.0000
Cr-51	27.710	d	0.01	4.1827E+22	3.2729E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5893E+22	4.5884E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.3420E+21	1.9406E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6135E+22	5673.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6341E+20	3721.	1.1880	0.1176	0.0000	0.0000
Ni-65	2.5200	h	0.04	1.7811E+18	3678.	0.5583	0.6276	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.9413E+19	2105.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9186E+21	2027.	0.8359	0.0034	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.0564E+18	999.5	0.9980	0.0000	0.0000	0.0000
Si-31	2.6200	h	0.38	4.3247E+17	859.0	0.0018	0.5952	0.0000	0.0000
P-32	14.270	d	0.28	5.0579E+19	768.5	0.0012	0.6949	0.0000	0.0000
Ta-184	8.7000	h	1.15	1.0026E+18	599.7	1.5620	0.4113	0.0000	0.0000
W-181	120.90	d	0.10	3.2774E+20	587.8	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0915E+19	77.34	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	2.0056E+13	71.57	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	4.0050E+17	58.09	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1460E+19	33.07	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3329E+18	32.40	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2860E+20	14.49	2.5030	0.0964	0.0000	0.0000
Co-61	1.6500	h	0.30	2.5647E+15	8.089	0.0970	0.4590	0.0000	0.0000
S-35	87.310	d	0.18	1.3849E+18	3.439	0.0000	0.0486	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.4064E+15	0.9056	0.0463	0.0297	0.0000	0.0000
V-49	330.00	d	6.06	1.3510E+18	0.8877	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Hf-183	1.0670	h	1.59	4.2211E+13	0.2059	0.7528	0.4179	0.0000	0.0000
Co-56	77.310	d	0.25	3.0096E+16	8.4409E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.3420E+15	5.2008E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1604E+15	1.8456E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0742E+16	1.5022E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.7858E+14	1.0571E-02	2.9100	0.0020	0.1449	0.0000
Hf-182m	1.0250	h	2.44	4.1329E+11	2.0982E-03	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	2.4764E+07	1.6393E-03	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	8.3158E+10	1.6392E-03	0.2667	0.5060	0.0000	0.0000
Al-28	2.2420	m	0.13	2.2700E+09	3.1613E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.2674E+12	3.1556E-04	1.3710	0.1524	0.0000	0.0000
Ta-185	49.000	m	4.08	6.7280E+09	4.2871E-05	0.1450	0.6334	0.0000	0.0000
H-3	12.330	y	0.16	2.6477E+14	1.2747E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	1.5223E+23	2.0770E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Cr-49	41.900	m	0.72	1.2617E+08	9.4019E-07	1.0600	0.0000	0.5970	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
W-179	37.050	m	0.43	9.7027E+06	8.1767E-08	0.0005	0.0000	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0129E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191544D+24

Total number of nuclides = 118
 Total activity (Ci) = 4.43875E+07

Total number of decays = 2.96736E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 16.898
 Average chain length = 1.5377

Average gamma E (MeV) = 0.46507
 Average beta E (MeV) = 0.27758
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 8.42058277 R/hr per Ci/m2
 Composite ECF per FGR table = 9.19681931 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.81340647 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.03163242 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.6927E+23	3.6932E+07	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	4.1612E+22	3.2561E+05	0.0328	0.0031	0.0000	0.0000
Co-58m	8.9000	h	1.12	5.1965E+20	3.0384E+05	0.0019	0.0208	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.1873E+20	2.3929E+05	1.6910	0.8309	0.0000	0.0000
W-185	75.100	d	0.40	1.5863E+22	4.5798E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.5725E+21	2.0111E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6131E+22	5672.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.6097E+20	3709.	1.1880	0.1176	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.8048E+19	2047.	0.2936	0.1877	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9173E+21	2026.	0.8359	0.0034	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.5840E+17	946.6	0.5583	0.6276	0.0000	0.0000
P-32	14.270	d	0.28	5.0077E+19	760.9	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2736E+20	587.1	0.0397	0.0000	0.0000	0.0000
Hf-180m	5.5000	h	1.82	5.6724E+17	536.7	0.9980	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	6.7669E+17	404.8	1.5620	0.4113	0.0000	0.0000
Si-31	2.6200	h	0.38	1.1722E+17	232.8	0.0018	0.5952	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0864E+19	77.25	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.9503E+13	69.59	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	3.6409E+17	52.81	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1474E+19	33.09	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.3116E+18	32.29	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2859E+20	14.49	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3826E+18	3.434	0.0000	0.0486	0.0000	0.0000
Co-61	1.6500	h	0.30	3.2269E+14	1.018	0.0970	0.4590	0.0000	0.0000
V-49	330.00	d	6.06	1.3504E+18	0.8873	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
Ta-180	8.0810	h	0.62	9.2105E+14	0.5931	0.0463	0.0297	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	3.0041E+16	8.4253E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.3083E+15	5.0700E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1483E+15	1.8353E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0732E+16	1.5018E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.7166E+14	1.0477E-02	2.9100	0.0020	0.1449	0.0000
Hf-183	1.0670	h	1.59	1.7112E+12	8.3454E-03	0.7528	0.4179	0.0000	0.0000
Al-28	2.2420	m	0.13	1.9273E+09	2.6841E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.0761E+12	2.6793E-04	1.3710	0.1524	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.4692E+10	7.4588E-05	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	8.8031E+05	5.8274E-05	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.9561E+09	5.8269E-05	0.2667	0.5060	0.0000	0.0000
H-3	12.330	y	0.16	2.6476E+14	1.2747E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	1.7833E+23	2.4331E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Ta-185	49.000	m	4.08	1.0210E+08	6.5057E-07	0.1450	0.6334	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Cr-49	41.900	m	0.72	9.4162E+05	7.0167E-09	1.0600	0.0000	0.5970	0.0000
Si-32	132.00	y	9.85	5.0129E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 117
 Total activity (Ci) = 3.78843E+07

Total number of decays = 3.23678E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 18.432
 Average chain length = 1.5377

Average gamma E (MeV) = 0.44808
 Average beta E (MeV) = 0.26986
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 8.11836433 R/hr per Ci/m2
 Composite ECF per FGR table = 8.90886402 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.60099125 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.28840601 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.4151E+23	3.0876E+07	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	4.1346E+22	3.2352E+05	0.0328	0.0031	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.2157E+20	1.8802E+05	0.0019	0.0208	0.0000	0.0000
Mn-56	2.5820	h	0.19	2.2703E+19	4.5756E+04	1.6910	0.8309	0.0000	0.0000
W-185	75.100	d	0.40	1.5825E+22	4.5689E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.7538E+21	2.0666E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6127E+22	5671.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.5793E+20	3694.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9156E+21	2025.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.6397E+19	1976.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.9456E+19	751.5	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2688E+20	586.2	0.0397	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.1415E+17	247.7	1.5620	0.4113	0.0000	0.0000
Hf-180m	5.5000	h	1.82	2.6090E+17	246.8	0.9980	0.0000	0.0000	0.0000
Ni-65	2.5200	h	0.04	8.4156E+16	173.8	0.5583	0.6276	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0800E+19	77.13	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.8832E+13	67.20	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	3.2322E+17	46.88	1.9200	0.0044	0.1430	0.0000
Si-31	2.6200	h	0.38	2.2959E+16	45.60	0.0018	0.5952	0.0000	0.0000
Co-57	271.80	d	0.02	4.1488E+19	33.10	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.2852E+18	32.16	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2858E+20	14.48	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3798E+18	3.427	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3497E+18	0.8868	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Ta-180	8.0810	h	0.62	5.4290E+14	0.3496	0.0463	0.0297	0.0000	0.0000
Co-56	77.310	d	0.25	2.9972E+16	8.4059E-02	3.5800	0.0036	0.1200	0.0000
Co-61	1.6500	h	0.30	2.4237E+13	7.6438E-02	0.0970	0.4590	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.2673E+15	4.9113E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1333E+15	1.8225E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0719E+16	1.5014E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.6311E+14	1.0361E-02	2.9100	0.0020	0.1449	0.0000
Al-28	2.2420	m	0.13	1.5711E+09	2.1879E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	8.7716E+11	2.1840E-04	1.3710	0.1524	0.0000	0.0000
Hf-183	1.0670	h	1.59	3.1236E+10	1.5234E-04	0.7528	0.4179	0.0000	0.0000
H-3	12.330	y	0.16	2.6475E+14	1.2746E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	2.0609E+23	2.8118E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Hf-182m	1.0250	h	2.44	2.2762E+08	1.1556E-06	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	1.3638E+04	9.0282E-07	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	4.5798E+07	9.0275E-07	0.2667	0.5060	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Ta-185	49.000	m	4.08	5.4632E+05	3.4811E-09	0.1450	0.6334	0.0000	0.0000
Si-32	132.00	y	9.85	5.0129E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Cr-49	41.900	m	0.72	2077.	1.5475E-11	1.0600	0.0000	0.5970	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 114
Total activity (Ci) = 3.15157E+07

Total number of decays = 3.52063E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 20.049
Average chain length = 1.5377

Average gamma E (MeV) = 0.44221
Average beta E (MeV) = 0.26712
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 8.01532841 R/hr per Ci/m2
Composite ECF per FGR table = 8.80927563 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.52757454 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.60909343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.1315E+23	2.4688E+07	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	4.1015E+22	3.2094E+05	0.0328	0.0031	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.7658E+20	1.0325E+05	0.0019	0.0208	0.0000	0.0000
W-185	75.100	d	0.40	1.5778E+22	4.5554E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.8774E+21	2.1044E+04	0.9770	0.0036	0.0300	0.0000
Mn-56	2.5820	h	0.19	2.8758E+18	5796.	1.6910	0.8309	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6121E+22	5670.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.5415E+20	3675.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9136E+21	2023.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.4415E+19	1892.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.8692E+19	739.8	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2628E+20	585.2	0.0397	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	2.2431E+17	134.2	1.5620	0.4113	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5940E+22	94.06	0.0000	0.0174	0.0000	0.0000
Hf-180m	5.5000	h	1.82	9.8906E+16	93.58	0.9980	0.0000	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0721E+19	76.98	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.8028E+13	64.33	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	2.7857E+17	40.40	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1499E+19	33.11	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.2523E+18	31.99	0.5180	0.1204	0.0000	0.0000
Ni-65	2.5200	h	0.04	1.0132E+16	20.92	0.5583	0.6276	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2856E+20	14.48	2.5030	0.0964	0.0000	0.0000
Si-31	2.6200	h	0.38	2.9967E+15	5.952	0.0018	0.5952	0.0000	0.0000
S-35	87.310	d	0.18	1.3763E+18	3.418	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3488E+18	0.8862	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Ta-180	8.0810	h	0.62	2.8055E+14	0.1807	0.0463	0.0297	0.0000	0.0000
Co-56	77.310	d	0.25	2.9886E+16	8.3818E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.2180E+15	4.7200E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.1147E+15	1.8066E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0704E+16	1.5008E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.5256E+14	1.0218E-02	2.9100	0.0020	0.1449	0.0000
Co-61	1.6500	h	0.30	9.5566E+11	3.0140E-03	0.0970	0.4590	0.0000	0.0000
Al-28	2.2420	m	0.13	1.2171E+09	1.6950E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	6.7955E+11	1.6920E-04	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6473E+14	1.2746E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	2.3445E+23	3.1988E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Hf-183	1.0670	h	1.59	2.1051E+08	1.0267E-06	0.7528	0.4179	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1.2498E+06	6.3450E-09	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	74.89	4.9572E-09	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	2.5147E+05	4.9568E-09	0.2667	0.5060	0.0000	0.0000
Si-32	132.00	y	9.85	5.0129E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Ta-185	49.000	m	4.08	795.2	5.0667E-12	0.1450	0.6334	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2212E+23	1.7384E-12	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 113
Total activity (Ci) = 2.51995E+07

Total number of decays = 3.81005E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 21.697
Average chain length = 1.5377

Average gamma E (MeV) = 0.44043
Average beta E (MeV) = 0.26613
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.98621464 R/hr per Ci/m2
Composite ECF per FGR table = 8.77781391 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.50532532 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.00960112 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	8.5571E+22	1.8671E+07	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	4.0607E+22	3.1774E+05	0.0328	0.0031	0.0000	0.0000
Co-58m	8.9000	h	1.12	8.3527E+19	4.8838E+04	0.0019	0.0208	0.0000	0.0000
W-185	75.100	d	0.40	1.5720E+22	4.5386E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.9433E+21	2.1246E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6114E+22	5668.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.4946E+20	3653.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9110E+21	2022.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.2057E+19	1792.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.7754E+19	725.6	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2553E+20	583.8	0.0397	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	2.1782E+17	439.0	1.6910	0.8309	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5939E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0623E+19	76.79	1.2910	0.2070	0.0000	0.0000
Ta-184	8.7000	h	1.15	1.0429E+17	62.38	1.5620	0.4113	0.0000	0.0000
W-183m	5.2500	s	1.33	1.7071E+13	60.91	0.1276	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	2.3136E+17	33.55	1.9200	0.0044	0.1430	0.0000
Co-57	271.80	d	0.02	4.1504E+19	33.11	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.2114E+18	31.78	0.5180	0.1204	0.0000	0.0000
Hf-180m	5.5000	h	1.82	2.9452E+16	27.87	0.9980	0.0000	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2855E+20	14.48	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3719E+18	3.407	0.0000	0.0486	0.0000	0.0000
Ni-65	2.5200	h	0.04	7.2020E+14	1.487	0.5583	0.6276	0.0000	0.0000
V-49	330.00	d	6.06	1.3476E+18	0.8855	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
Si-31	2.6200	h	0.38	2.3563E+14	0.4680	0.0018	0.5952	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.9779E+16	8.3518E-02	3.5800	0.0036	0.1200	0.0000
Ta-180	8.0810	h	0.62	1.2301E+14	7.9214E-02	0.0463	0.0297	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.1590E+15	4.4915E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.0917E+15	1.7869E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0685E+16	1.5001E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.3959E+14	1.0041E-02	2.9100	0.0020	0.1449	0.0000
Al-28	2.2420	m	0.13	8.8490E+08	1.2323E-04	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	4.9406E+11	1.2301E-04	1.3710	0.1524	0.0000	0.0000
Co-61	1.6500	h	0.30	1.6851E+10	5.3146E-05	0.0970	0.4590	0.0000	0.0000
H-3	12.330	y	0.16	2.6472E+14	1.2745E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.4351E+11	y	2.99	2.6203E+23	3.5750E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0129E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Hf-183	1.0670	h	1.59	4.0870E+05	1.9933E-09	0.7528	0.4179	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Hf-182m	1.0250	h	2.44	1879.	9.5379E-12	0.9860	0.0888	0.0000	0.0000
Ta-182m	0.28300	s	1.06	0.1126	7.4517E-12	0.0017	0.0122	0.0000	0.0000
Ta-182n	15.840	m	0.63	378.0	7.4511E-12	0.2667	0.5060	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2212E+23	1.7384E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7889E-13	0.2370	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 110
 Total activity (Ci) = 1.91191E+07

Total number of decays = 4.09192E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 23.302
 Average chain length = 1.5377

Average gamma E (MeV) = 0.43914
 Average beta E (MeV) = 0.26518
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.96722794 R/hr per Ci/m2
 Composite ECF per FGR table = 8.75213146 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.48921490 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 2.50979114 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	6.0368E+22	1.3172E+07	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	4.0102E+22	3.1379E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5648E+22	4.5177E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.9600E+21	2.1297E+04	0.9770	0.0036	0.0300	0.0000
Co-58m	8.9000	h	1.12	3.2794E+19	1.9174E+04	0.0019	0.0208	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6105E+22	5666.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.4365E+20	3624.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9078E+21	2019.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.9288E+19	1674.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.6607E+19	708.2	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2460E+20	582.1	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5939E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0500E+19	76.56	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.5947E+13	56.90	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1499E+19	33.10	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.1608E+18	31.52	0.5180	0.1204	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.8347E+17	26.61	1.9200	0.0044	0.1430	0.0000
Ta-184	8.7000	h	1.15	4.0076E+16	23.97	1.5620	0.4113	0.0000	0.0000
Mn-56	2.5820	h	0.19	8.6798E+15	17.49	1.6910	0.8309	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2852E+20	14.48	2.5030	0.0964	0.0000	0.0000
Hf-180m	5.5000	h	1.82	6.4875E+15	6.138	0.9980	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	1.3665E+18	3.394	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3462E+18	0.8845	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.9645E+16	8.3144E-02	3.5800	0.0036	0.1200	0.0000
Ni-65	2.5200	h	0.04	2.6511E+13	5.4746E-02	0.5583	0.6276	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.0894E+15	4.2216E-02	3.4530	0.0027	0.0716	0.0000
Ta-180	8.0810	h	0.62	4.3929E+13	2.8289E-02	0.0463	0.0297	0.0000	0.0000
Si-31	2.6200	h	0.38	9.8389E+12	1.9542E-02	0.0018	0.5952	0.0000	0.0000
P-33	25.380	d	0.16	2.0633E+15	1.7627E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0661E+16	1.4992E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.2371E+14	9.8258E-03	2.9100	0.0020	0.1449	0.0000
Al-28	2.2420	m	0.13	5.9427E+08	8.2760E-05	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	3.3180E+11	8.2613E-05	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6470E+14	1.2744E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	2.8723E+23	3.9189E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Co-61	1.6500	h	0.30	1.0877E+08	3.4303E-07	0.0970	0.4590	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0128E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2213E+23	1.7384E-12	0.0000	0.0000	0.0000	0.0000
Hf-183	1.0670	h	1.59	167.7	8.1799E-13	0.7528	0.4179	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7889E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	4487.	3.8837E-14	0.8910	0.0000	0.0000	0.0000
Hf-182m	1.0250	h	2.44	0.5601	2.8435E-15	0.9860	0.0888	0.0000	0.0000

Check of numerical solution:

Initial number of atoms	=	1.142016872191543D+24
Current number of atoms	=	1.142016872191543D+24

Total number of nuclides	=	109
Total activity (Ci)	=	1.35857E+07

Total number of decays	=	4.35081E+23
Asympt number of decays	=	1.75603E+24
Percent of decays	=	24.776
Average chain length	=	1.5377

Average gamma E (MeV)	=	0.43675
Average beta E (MeV)	=	0.26341
Average alpha E (MeV)	=	0.0000

Composite Exposure Rate Conversion Factor	=	7.93112326	R/hr per Ci/m2
Composite ECF per FGR table	=	8.70332527	R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor	=	5.45937681	Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.13448501 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	3.9046E+22	8.5193E+06	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	3.9480E+22	3.0892E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5558E+22	4.4917E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.9401E+21	2.1236E+04	0.9770	0.0036	0.0300	0.0000
Co-58m	8.9000	h	1.12	1.0202E+19	5965.	0.0019	0.0208	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.6093E+22	5664.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.3644E+20	3589.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.9037E+21	2017.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.6084E+19	1537.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.5214E+19	687.0	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2344E+20	580.1	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5939E+22	94.06	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0348E+19	76.27	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.4646E+13	52.26	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1479E+19	33.09	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.0982E+18	31.20	0.5180	0.1204	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.3733E+17	19.92	1.9200	0.0044	0.1430	0.0000
Co-60	5.2701	y	0.02	1.2849E+20	14.47	2.5030	0.0964	0.0000	0.0000
Ta-184	8.7000	h	1.15	1.2137E+16	7.260	1.5620	0.4113	0.0000	0.0000
S-35	87.310	d	0.18	1.3597E+18	3.377	0.0000	0.0486	0.0000	0.0000
Hf-180m	5.5000	h	1.82	9.8059E+14	0.9278	0.9980	0.0000	0.0000	0.0000
V-49	330.00	d	6.06	1.3445E+18	0.8834	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.5508E+14	0.3125	1.6910	0.8309	0.0000	0.0000
Co-56	77.310	d	0.25	2.9480E+16	8.2680E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	1.0082E+15	3.9072E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	2.0284E+15	1.7329E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0631E+16	1.4981E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	7.0435E+14	9.5630E-03	2.9100	0.0020	0.1449	0.0000
Ta-180	8.0810	h	0.62	1.2141E+13	7.8183E-03	0.0463	0.0297	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.2901E+11	8.8590E-04	0.5583	0.6276	0.0000	0.0000
Si-31	2.6200	h	0.38	1.8635E+11	3.7013E-04	0.0018	0.5952	0.0000	0.0000
Al-28	2.2420	m	0.13	3.6144E+08	5.0336E-05	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	2.0180E+11	5.0246E-05	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6467E+14	1.2743E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.0855E+23	4.2098E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0128E+11	2.2544E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Co-61	1.6500	h	0.30	2.0008E+05	6.3101E-10	0.0970	0.4590	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2213E+23	1.7384E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7890E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	5556.	4.8092E-14	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Hf-183	1.0670	h	1.59	9.8799E-03	4.8185E-17	0.7528	0.4179	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 107
Total activity (Ci) = 8.91476E+06

Total number of decays = 4.57209E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 26.036
Average chain length = 1.5377

Average gamma E (MeV) = 0.43196
Average beta E (MeV) = 0.25996
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.85697079 R/hr per Ci/m2
Composite ECF per FGR table = 8.60539055 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.39945412 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 3.91466618 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	2.2659E+22	4.9439E+06	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	3.8717E+22	3.0295E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5446E+22	4.4595E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.8952E+21	2.1099E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6079E+22	5660.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.2755E+20	3546.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8987E+21	2013.	0.8359	0.0034	0.0000	0.0000
Co-58m	8.9000	h	1.12	2.3733E+18	1388.	0.0019	0.0208	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.2447E+19	1382.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.3533E+19	661.5	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2199E+20	577.5	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5939E+22	94.05	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	4.0158E+19	75.91	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.3170E+13	46.99	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1438E+19	33.06	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	6.0209E+18	30.80	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2846E+20	14.47	2.5030	0.0964	0.0000	0.0000
Ni-57	1.4950	d	0.84	9.5650E+16	13.87	1.9200	0.0044	0.1430	0.0000
S-35	87.310	d	0.18	1.3513E+18	3.356	0.0000	0.0486	0.0000	0.0000
Ta-184	8.7000	h	1.15	2.7305E+15	1.633	1.5620	0.4113	0.0000	0.0000
V-49	330.00	d	6.06	1.3423E+18	0.8819	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Hf-180m	5.5000	h	1.82	9.2609E+13	8.7622E-02	0.9980	0.0000	0.0000	0.0000
Co-56	77.310	d	0.25	2.9274E+16	8.2103E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	9.1534E+14	3.5473E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	1.9856E+15	1.6963E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0593E+16	1.4968E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	6.8090E+14	9.2446E-03	2.9100	0.0020	0.1449	0.0000
Mn-56	2.5820	h	0.19	1.0175E+12	2.0506E-03	1.6910	0.8309	0.0000	0.0000
Ta-180	8.0810	h	0.62	2.4364E+12	1.5689E-03	0.0463	0.0297	0.0000	0.0000
Al-28	2.2420	m	0.13	1.9424E+08	2.7051E-05	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.0845E+11	2.7003E-05	1.3710	0.1524	0.0000	0.0000
H-3	12.330	y	0.16	2.6464E+14	1.2741E-05	0.0000	0.0057	0.0000	0.0000
Ni-65	2.5200	h	0.04	2.4873E+09	5.1362E-06	0.5583	0.6276	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.2494E+23	4.4334E-06	0.0000	0.0007	0.0000	0.0000
Si-31	2.6200	h	0.38	1.3151E+09	2.6121E-06	0.0018	0.5952	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0127E+11	2.2543E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2213E+23	1.7384E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7890E-13	0.2370	0.0000	0.0000	0.0000
Co-61	1.6500	h	0.30	76.75	2.4206E-13	0.0970	0.4590	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6866.	5.9428E-14	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5677E-17	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 107
 Total activity (Ci) = 5.32808E+06

Total number of decays = 4.74567E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 27.025
 Average chain length = 1.5377

Average gamma E (MeV) = 0.42228
 Average beta E (MeV) = 0.25306
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.70614481 R/hr per Ci/m2
 Composite ECF per FGR table = 8.40796280 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 5.27855921 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 4.88902712 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.1484E+22	2.5056E+06	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	3.7785E+22	2.9566E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5308E+22	4.4196E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.8317E+21	2.0905E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6061E+22	5657.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.1658E+20	3492.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8924E+21	2009.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	2.8415E+19	1210.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	4.1521E+19	630.9	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.2020E+20	574.3	0.0397	0.0000	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.8407E+17	224.6	0.0019	0.0208	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5939E+22	94.05	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.9922E+19	75.47	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	1.1533E+13	41.16	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1370E+19	33.00	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.9257E+18	30.32	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2841E+20	14.46	2.5030	0.0964	0.0000	0.0000
Ni-57	1.4950	d	0.84	6.0882E+16	8.830	1.9200	0.0044	0.1430	0.0000
S-35	87.310	d	0.18	1.3409E+18	3.330	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3395E+18	0.8801	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.2374E+14	0.2535	1.5620	0.4113	0.0000	0.0000
Co-56	77.310	d	0.25	2.9020E+16	8.1389E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	8.1126E+14	3.1439E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	1.9335E+15	1.6518E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0547E+16	1.4950E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	6.5270E+14	8.8618E-03	2.9100	0.0020	0.1449	0.0000
Hf-180m	5.5000	h	1.82	4.8613E+12	4.5995E-03	0.9980	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	3.2781E+11	2.1110E-04	0.0463	0.0297	0.0000	0.0000
H-3	12.330	y	0.16	2.6460E+14	1.2739E-05	0.0000	0.0057	0.0000	0.0000
Al-28	2.2420	m	0.13	8.9440E+07	1.2456E-05	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	4.9936E+10	1.2433E-05	1.3710	0.1524	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.3612E+23	4.5859E-06	0.0000	0.0007	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.9105E+09	3.8505E-06	1.6910	0.8309	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Ni-65	2.5200	h	0.04	4.0020E+06	8.2641E-09	0.5583	0.6276	0.0000	0.0000
Si-31	2.6200	h	0.38	2.7048E+06	5.3723E-09	0.0018	0.5952	0.0000	0.0000
Si-32	132.00	y	9.85	5.0126E+11	2.2543E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2214E+23	1.7385E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7891E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	8462.	7.3247E-14	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
Co-61	1.6500	h	0.30	4.1565E-03	1.3109E-17	0.0970	0.4590	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 106
Total activity (Ci) = 2.88046E+06

Total number of decays = 4.86923E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 27.729
Average chain length = 1.5377

Average gamma E (MeV) = 0.40203
Average beta E (MeV) = 0.23863
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 7.38950539 R/hr per Ci/m2
Composite ECF per FGR table = 7.99451685 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.02535439 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 6.10591888 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	4.9142E+21	1.0722E+06	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	3.6652E+22	2.8679E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.5137E+22	4.3702E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.7512E+21	2.0658E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6039E+22	5652.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	7.0313E+20	3427.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8846E+21	2003.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	2.4076E+19	1026.	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	3.9137E+19	594.7	0.0012	0.6949	0.0000	0.0000
W-181	120.90	d	0.10	3.1797E+20	570.3	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5938E+22	94.05	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.9630E+19	74.91	1.2910	0.2070	0.0000	0.0000
W-183m	5.2500	s	1.33	9.7722E+12	34.87	0.1276	0.0000	0.0000	0.0000
Co-57	271.80	d	0.02	4.1268E+19	32.92	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.8089E+18	29.72	0.5180	0.1204	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.9498E+16	23.09	0.0019	0.0208	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2836E+20	14.46	2.5030	0.0964	0.0000	0.0000
Ni-57	1.4950	d	0.84	3.4631E+16	5.023	1.9200	0.0044	0.1430	0.0000
S-35	87.310	d	0.18	1.3280E+18	3.298	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3361E+18	0.8779	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.8705E+16	8.0506E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	6.9773E+14	2.7039E-02	3.4530	0.0027	0.0716	0.0000
Ta-184	8.7000	h	1.15	4.1358E+13	2.4738E-02	1.5620	0.4113	0.0000	0.0000
P-33	25.380	d	0.16	1.8703E+15	1.5978E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0489E+16	1.4929E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	6.1913E+14	8.4059E-03	2.9100	0.0020	0.1449	0.0000
Hf-180m	5.5000	h	1.82	1.2253E+11	1.1594E-04	0.9980	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	2.6772E+10	1.7240E-05	0.0463	0.0297	0.0000	0.0000
H-3	12.330	y	0.16	2.6455E+14	1.2737E-05	0.0000	0.0057	0.0000	0.0000
Al-28	2.2420	m	0.13	3.3953E+07	4.7284E-06	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.8957E+10	4.7199E-06	1.3710	0.1524	0.0000	0.0000
Re-187	0.4351E+11	y	2.99	3.4269E+23	4.6755E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0126E+11	2.2543E-09	0.0000	0.0686	0.0000	0.0000
Mn-56	2.5820	h	0.19	7.5189E+05	1.5154E-09	1.6910	0.8309	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Ni-65	2.5200	h	0.04	1299.	2.6818E-12	0.5583	0.6276	0.0000	0.0000
Si-31	2.6200	h	0.38	1193.	2.3689E-12	0.0018	0.5952	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2214E+23	1.7385E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5769	5.7892E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	1.0397E+04	8.9990E-14	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms	=	1.142016872191543D+24
Current number of atoms	=	1.142016872191543D+24

Total number of nuclides	=	106
Total activity (Ci)	=	1.43697E+06

Total number of decays	=	4.94931E+23
Asympt number of decays	=	1.75603E+24
Percent of decays	=	28.185
Average chain length	=	1.5377

Average gamma E (MeV)	=	0.35893
Average beta E (MeV)	=	0.20791
Average alpha E (MeV)	=	0.0000

Composite Exposure Rate Conversion Factor	=	6.71548271	R/hr per Ci/m2
Composite ECF per FGR table	=	7.11469889	R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor	=	4.48661757	Rem/hr per Ci/m2

Bomb Component Source

Point in time = 7.62569809 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-187	23.850	h	0.34	1.7025E+21	3.7146E+05	0.4476	0.2710	0.0000	0.0000
Cr-51	27.710	d	0.01	3.5285E+22	2.7610E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.4926E+22	4.3093E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.6517E+21	2.0353E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.6012E+22	5646.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	6.8667E+20	3347.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8749E+21	1997.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.9575E+19	833.9	0.2936	0.1877	0.0000	0.0000
W-181	120.90	d	0.10	3.1521E+20	565.3	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	3.6352E+19	552.4	0.0012	0.6949	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5938E+22	94.05	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.9267E+19	74.23	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	4.1125E+19	32.81	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.6663E+18	28.99	0.5180	0.1204	0.0000	0.0000
W-183m	5.2500	s	1.33	7.9453E+12	28.35	0.1276	0.0000	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2829E+20	14.45	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.3121E+18	3.258	0.0000	0.0486	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.7117E+16	2.483	1.9200	0.0044	0.1430	0.0000
Co-58m	8.9000	h	1.12	2.3061E+15	1.348	0.0019	0.0208	0.0000	0.0000
V-49	330.00	d	6.06	1.3318E+18	0.8751	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.8316E+16	7.9416E-02	3.5800	0.0036	0.1200	0.0000
Mn-52	5.5950	d	0.05	5.7798E+14	2.2399E-02	3.4530	0.0027	0.0716	0.0000
P-33	25.380	d	0.16	1.7942E+15	1.5328E-02	0.0000	0.0764	0.0000	0.0000
Ta-179	1.6100	y	1.70	4.0416E+16	1.4902E-02	0.0273	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	5.7960E+14	7.8693E-03	2.9100	0.0020	0.1449	0.0000
Ta-184	8.7000	h	1.15	2.2620E+12	1.3530E-03	1.5620	0.4113	0.0000	0.0000
H-3	12.330	y	0.16	2.6449E+14	1.2734E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4590E+23	4.7193E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Al-28	2.2420	m	0.13	1.0128E+07	1.4104E-06	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	5.6546E+09	1.4079E-06	1.3710	0.1524	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2357E+09	1.1691E-06	0.9980	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.1720E+09	7.5474E-07	0.0463	0.0297	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0125E+11	2.2542E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2215E+23	1.7385E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7893E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	1.2723E+04	1.1013E-13	0.8910	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	42.04	8.4724E-14	1.6910	0.8309	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Si-31	2.6200	h	0.38	7.6859E-02	1.5266E-16	0.0018	0.5952	0.0000	0.0000
Ni-65	2.5200	h	0.04	5.7065E-02	1.1784E-16	0.5583	0.6276	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 105
 Total activity (Ci) = 7.24224E+05

Total number of decays = 4.99885E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 28.467
 Average chain length = 1.5377

Average gamma E (MeV) = 0.27794
 Average beta E (MeV) = 0.15003
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 5.44895220 R/hr per Ci/m2
 Composite ECF per FGR table = 5.46089649 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 3.47428584 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 9.52373600 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	3.3649E+22	2.6329E+05	0.0328	0.0031	0.0000	0.0000
W-187	23.850	h	0.34	4.5302E+20	9.8844E+04	0.4476	0.2710	0.0000	0.0000
W-185	75.100	d	0.40	1.4667E+22	4.2345E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.5293E+21	1.9979E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5978E+22	5639.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	6.6667E+20	3249.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8628E+21	1988.	0.8359	0.0034	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.5116E+19	643.9	0.2936	0.1877	0.0000	0.0000
W-181	120.90	d	0.10	3.1180E+20	559.2	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	3.3151E+19	503.7	0.0012	0.6949	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5937E+22	94.04	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.8820E+19	73.38	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	4.0937E+19	32.66	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.4931E+18	28.10	0.5180	0.1204	0.0000	0.0000
W-183m	5.2500	s	1.33	6.1356E+12	21.89	0.1276	0.0000	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2820E+20	14.44	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.2925E+18	3.210	0.0000	0.0486	0.0000	0.0000
Ni-57	1.4950	d	0.84	7.0999E+15	1.030	1.9200	0.0044	0.1430	0.0000
V-49	330.00	d	6.06	1.3265E+18	0.8716	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.7838E+16	7.8076E-02	3.5800	0.0036	0.1200	0.0000
Co-58m	8.9000	h	1.12	6.6391E+13	3.8818E-02	0.0019	0.0208	0.0000	0.0000
Mn-52	5.5950	d	0.05	4.5687E+14	1.7705E-02	3.4530	0.0027	0.0716	0.0000
Ta-179	1.6100	y	1.70	4.0326E+16	1.4869E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.7036E+15	1.4554E-02	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	5.3377E+14	7.2470E-03	2.9100	0.0020	0.1449	0.0000
Ta-184	8.7000	h	1.15	6.0022E+10	3.5901E-05	1.5620	0.4113	0.0000	0.0000
H-3	12.330	y	0.16	2.6441E+14	1.2730E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4715E+23	4.7364E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Al-28	2.2420	m	0.13	2.2356E+06	3.1134E-07	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.2482E+09	3.1079E-07	1.3710	0.1524	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	2.3552E+07	1.5166E-08	0.0463	0.0297	0.0000	0.0000
Hf-180m	5.5000	h	1.82	3.9688E+06	3.7551E-09	0.9980	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0123E+11	2.2542E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2215E+23	1.7385E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7893E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	1.5494E+04	1.3411E-13	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	2.0546E-04	4.1408E-19	1.6910	0.8309	0.0000	0.0000
Si-31	2.6200	h	0.38	4.4854E-07	8.9089E-22	0.0018	0.5952	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 104
Total activity (Ci) = 4.37315E+05

Total number of decays = 5.03232E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 28.657
Average chain length = 1.5377

Average gamma E (MeV) = 0.17905
Average beta E (MeV) = 7.89964E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.90259457 R/hr per Ci/m2
Composite ECF per FGR table = 3.44007421 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.23810315 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 11.8942184 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	3.1711E+22	2.4813E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.4349E+22	4.1429E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.3796E+21	1.9521E+04	0.9770	0.0036	0.0300	0.0000
W-187	23.850	h	0.34	8.6705E+19	1.8918E+04	0.4476	0.2710	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.5935E+22	5629.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	6.4249E+20	3131.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8478E+21	1978.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	3.0759E+20	551.6	0.0397	0.0000	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.0946E+19	466.3	0.2936	0.1877	0.0000	0.0000
P-32	14.270	d	0.28	2.9545E+19	448.9	0.0012	0.6949	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5936E+22	94.04	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.8267E+19	72.34	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	4.0695E+19	32.46	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.2842E+18	27.04	0.5180	0.1204	0.0000	0.0000
W-183m	5.2500	s	1.33	4.4429E+12	15.85	0.1276	0.0000	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2809E+20	14.43	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.2684E+18	3.150	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3200E+18	0.8673	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3797	0.0000	0.0495	0.0000	0.0000
Ni-57	1.4950	d	0.84	2.3656E+15	0.3431	1.9200	0.0044	0.1430	0.0000
Co-56	77.310	d	0.25	2.7253E+16	7.6435E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	4.0213E+16	1.4827E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.5968E+15	1.3642E-02	0.0000	0.0764	0.0000	0.0000
Mn-52	5.5950	d	0.05	3.4061E+14	1.3200E-02	3.4530	0.0027	0.0716	0.0000
V-48	15.970	d	0.02	4.8158E+14	6.5385E-03	2.9100	0.0020	0.1449	0.0000
Co-58m	8.9000	h	1.12	7.9037E+11	4.6213E-04	0.0019	0.0208	0.0000	0.0000
H-3	12.330	y	0.16	2.6432E+14	1.2726E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4751E+23	4.7414E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Ta-184	8.7000	h	1.15	6.4535E+08	3.8601E-07	1.5620	0.4113	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Al-28	2.2420	m	0.13	3.3882E+05	4.7186E-08	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.8917E+08	4.7101E-08	1.3710	0.1524	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0121E+11	2.2541E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.7895E+05	1.1523E-10	0.0463	0.0297	0.0000	0.0000
Hf-180m	5.5000	h	1.82	3054.	2.8893E-12	0.9980	0.0000	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2215E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7894E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	1.8757E+04	1.6235E-13	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	4.7847E-11	9.6431E-26	1.6910	0.8309	0.0000	0.0000
Si-31	2.6200	h	0.38	1.3036E-13	2.5892E-28	0.0018	0.5952	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 103
Total activity (Ci) = 3.40469E+05

Total number of decays = 5.06098E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 28.821
Average chain length = 1.5377

Average gamma E (MeV) = 0.12152
Average beta E (MeV) = 3.70728E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.00347733 R/hr per Ci/m2
Composite ECF per FGR table = 2.26228666 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.51906204 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 14.8547211 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	2.9448E+22	2.3042E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.3963E+22	4.0312E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	6.1975E+21	1.8964E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5882E+22	5618.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	6.1353E+20	2990.	1.1880	0.1176	0.0000	0.0000
W-187	23.850	h	0.34	1.0996E+19	2399.	0.4476	0.2710	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8291E+21	1965.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	3.0242E+20	542.4	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	2.5588E+19	388.8	0.0012	0.6949	0.0000	0.0000
Ta-183	5.0900	d	1.38	7.3141E+18	311.6	0.2936	0.1877	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5936E+22	94.03	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.7589E+19	71.06	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	4.0391E+19	32.22	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	5.0345E+18	25.76	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2795E+20	14.41	2.5030	0.0964	0.0000	0.0000
W-183m	5.2500	s	1.33	2.9688E+12	10.59	0.1276	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	1.2389E+18	3.077	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3118E+18	0.8619	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Ni-57	1.4950	d	0.84	5.9954E+14	8.6954E-02	1.9200	0.0044	0.1430	0.0000
Co-56	77.310	d	0.25	2.6539E+16	7.4432E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	4.0073E+16	1.4776E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.4728E+15	1.2582E-02	0.0000	0.0764	0.0000	0.0000
Mn-52	5.5950	d	0.05	2.3603E+14	9.1470E-03	3.4530	0.0027	0.0716	0.0000
V-48	15.970	d	0.02	4.2351E+14	5.7500E-03	2.9100	0.0020	0.1449	0.0000
H-3	12.330	y	0.16	2.6420E+14	1.2720E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4759E+23	4.7424E-06	0.0000	0.0007	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.1232E+09	1.8261E-06	0.0019	0.0208	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	3.2106E+04	4.4712E-09	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.7925E+07	4.4632E-09	1.3710	0.1524	0.0000	0.0000
Si-32	132.00	y	9.85	5.0119E+11	2.2540E-09	0.0000	0.0686	0.0000	0.0000
Ta-184	8.7000	h	1.15	2.2455E+06	1.3431E-09	1.5620	0.4113	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2216E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7895E-13	0.2370	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	403.6	2.5988E-13	0.0463	0.0297	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	2.2542E+04	1.9512E-13	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Hf-180m	5.5000	h	1.82	0.3944	3.7318E-16	0.9980	0.0000	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	2.4891E-19	5.0166E-34	1.6910	0.8309	0.0000	0.0000
Si-31	2.6200	h	0.38	8.9428E-22	1.7762E-36	0.0018	0.5952	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 99
 Total activity (Ci) = 3.04167E+05

Total number of decays = 5.09122E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 28.993
 Average chain length = 1.5377

Average gamma E (MeV) = 0.10727
 Average beta E (MeV) = 2.57838E-02
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.78104949 R/hr per Ci/m2
 Composite ECF per FGR table = 1.96686840 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.34088731 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 18.5520649 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	2.6846E+22	2.1007E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.3494E+22	3.8959E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.9774E+21	1.8290E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5816E+22	5603.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	5.7919E+20	2823.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.8060E+21	1949.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	2.9607E+20	531.0	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	2.1381E+19	324.9	0.0012	0.6949	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.4207E+18	188.3	0.2936	0.1877	0.0000	0.0000
W-187	23.850	h	0.34	8.3412E+17	182.0	0.4476	0.2710	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5934E+22	94.03	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.6758E+19	69.49	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	4.0012E+19	31.92	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	4.7390E+18	24.25	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2778E+20	14.39	2.5030	0.0964	0.0000	0.0000
W-183m	5.2500	s	1.33	1.7944E+12	6.403	0.1276	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	1.2031E+18	2.988	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.3016E+18	0.8552	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.5674E+16	7.2005E-02	3.5800	0.0036	0.1200	0.0000
Ni-57	1.4950	d	0.84	1.0798E+14	1.5660E-02	1.9200	0.0044	0.1430	0.0000
Ta-179	1.6100	y	1.70	3.9899E+16	1.4712E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.3313E+15	1.1374E-02	0.0000	0.0764	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.4929E+14	5.7856E-03	3.4530	0.0027	0.0716	0.0000
V-48	15.970	d	0.02	3.6072E+14	4.8975E-03	2.9100	0.0020	0.1449	0.0000
H-3	12.330	y	0.16	2.6404E+14	1.2713E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0117E+11	2.2539E-09	0.0000	0.0686	0.0000	0.0000
Co-58m	8.9000	h	1.12	3.1133E+06	1.8203E-09	0.0019	0.0208	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Al-28	2.2420	m	0.13	1692.	2.3568E-10	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	9.4487E+05	2.3526E-10	1.3710	0.1524	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2216E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	1910.	1.1422E-12	1.5620	0.4113	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7895E-13	0.2370	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	2.6855E+04	2.3245E-13	0.8910	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180	8.0810	h	0.62	0.1997	1.2859E-16	0.0463	0.0297	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Hf-180m	5.5000	h	1.82	5.4851E-06	5.1897E-21	0.9980	0.0000	0.0000	0.0000
Mn-56	2.5820	h	0.19	1.1232E-29	2.2421E-44	1.6910	0.8309	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 99
 Total activity (Ci) = 2.79164E+05

Total number of decays = 5.12563E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 29.189
 Average chain length = 1.5377

Average gamma E (MeV) = 0.10767
 Average beta E (MeV) = 2.47055E-02
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.78763866 R/hr per Ci/m2
 Composite ECF per FGR table = 1.96948314 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.34586191 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 23.1697197 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	2.3918E+22	1.8715E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.2931E+22	3.7334E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.7134E+21	1.7483E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5733E+22	5585.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	5.3898E+20	2627.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.7774E+21	1929.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	2.8834E+20	517.1	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	1.7085E+19	259.6	0.0012	0.6949	0.0000	0.0000
Ta-183	5.0900	d	1.38	2.3572E+18	100.4	0.2936	0.1877	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5933E+22	94.02	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.5747E+19	67.57	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	3.9544E+19	31.55	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	4.3943E+18	22.48	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2757E+20	14.37	2.5030	0.0964	0.0000	0.0000
W-187	23.850	h	0.34	3.3299E+16	7.266	0.4476	0.2710	0.0000	0.0000
W-183m	5.2500	s	1.33	9.5678E+11	3.414	0.1276	0.0000	0.0000	0.0000
S-35	87.310	d	0.18	1.1598E+18	2.880	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.2891E+18	0.8470	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.4633E+16	6.9085E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.9683E+16	1.4632E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.1736E+15	1.0026E-02	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	2.9521E+14	4.0081E-03	2.9100	0.0020	0.1449	0.0000
Mn-52	5.5950	d	0.05	8.4255E+13	3.2652E-03	3.4530	0.0027	0.0716	0.0000
Ni-57	1.4950	d	0.84	1.2692E+13	1.8408E-03	1.9200	0.0044	0.1430	0.0000
H-3	12.330	y	0.16	2.6386E+14	1.2704E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0113E+11	2.2537E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Al-28	2.2420	m	0.13	42.88	5.9716E-12	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	2.3941E+04	5.9609E-12	1.3710	0.1524	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2216E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Co-58m	8.9000	h	1.12	555.6	3.2485E-13	0.0019	0.0208	0.0000	0.0000
Hf-179n	25.050	d	1.00	3.1656E+04	2.7401E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-184	8.7000	h	1.15	0.2795	1.6715E-16	1.5620	0.4113	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.4859E-05	9.5687E-21	0.0463	0.0297	0.0000	0.0000
Hf-180m	5.5000	h	1.82	4.7152E-12	4.4612E-27	0.9980	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 98
 Total activity (Ci) = 2.53233E+05

Total number of decays = 5.16488E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 29.412
 Average chain length = 1.5377

Average gamma E (MeV) = 0.11120
 Average beta E (MeV) = 2.55096E-02
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.84295225 R/hr per Ci/m2
 Composite ECF per FGR table = 2.03439498 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.38994360 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 28.9367237 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	2.0705E+22	1.6201E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.2261E+22	3.5399E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.4000E+21	1.6524E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5630E+22	5563.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	4.9267E+20	2401.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.7421E+21	1904.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	2.7896E+20	500.3	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	1.2911E+19	196.2	0.0012	0.6949	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5931E+22	94.01	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.4522E+19	65.26	1.2910	0.2070	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.0748E+18	45.79	0.2936	0.1877	0.0000	0.0000
Co-57	271.80	d	0.02	3.8966E+19	31.08	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	3.9988E+18	20.46	0.5180	0.1204	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2731E+20	14.34	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.1079E+18	2.751	0.0000	0.0486	0.0000	0.0000
W-183m	5.2500	s	1.33	4.3626E+11	1.557	0.1276	0.0000	0.0000	0.0000
V-49	330.00	d	6.06	1.2735E+18	0.8368	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3796	0.0000	0.0495	0.0000	0.0000
W-187	23.850	h	0.34	5.9631E+14	0.1301	0.4476	0.2710	0.0000	0.0000
Co-56	77.310	d	0.25	2.3391E+16	6.5604E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.9414E+16	1.4533E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.0026E+15	8.5650E-03	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	2.2984E+14	3.1205E-03	2.9100	0.0020	0.1449	0.0000
Mn-52	5.5950	d	0.05	4.1239E+13	1.5982E-03	3.4530	0.0027	0.0716	0.0000
Ni-57	1.4950	d	0.84	8.7558E+11	1.2699E-04	1.9200	0.0044	0.1430	0.0000
H-3	12.330	y	0.16	2.6362E+14	1.2692E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0109E+11	2.2535E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2216E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	3.6853E+04	3.1899E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	0.4352	6.0611E-14	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	243.0	6.0503E-14	1.3710	0.1524	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.1569E-02	6.7644E-18	0.0019	0.0208	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.5418E-06	2.7166E-21	1.5620	0.4113	0.0000	0.0000
Ta-180	8.0810	h	0.62	1.0377E-10	6.6824E-26	0.0463	0.0297	0.0000	0.0000
Hf-180m	5.5000	h	1.82	1.2533E-19	1.1858E-34	0.9980	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 98
 Total activity (Ci) = 2.24776E+05

Total number of decays = 5.20888E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 29.663
 Average chain length = 1.5377

Average gamma E (MeV) = 0.11604
 Average beta E (MeV) = 2.67863E-02
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 2.91858888 R/hr per Ci/m2
 Composite ECF per FGR table = 2.12414861 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.45052767 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 36.1390800 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	1.7291E+22	1.3530E+05	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	1.1472E+22	3.3122E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.0327E+21	1.5400E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5502E+22	5535.	0.0016	0.0038	0.0000	0.0000
Fe-59	44.490	d	0.02	4.4037E+20	2146.	1.1880	0.1176	0.0000	0.0000
Mn-54	312.20	d	0.01	2.6986E+21	1874.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	2.6768E+20	480.1	0.0397	0.0000	0.0000	0.0000
P-32	14.270	d	0.28	9.0998E+18	138.3	0.0012	0.6949	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5929E+22	94.00	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	3.3052E+19	62.48	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	3.8257E+19	30.52	0.1252	0.0176	0.0000	0.0000
Hf-181	42.380	d	0.14	3.5544E+18	18.19	0.5180	0.1204	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.0306E+17	17.17	0.2936	0.1877	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2698E+20	14.30	2.5030	0.0964	0.0000	0.0000
S-35	87.310	d	0.18	1.0463E+18	2.598	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	1.2544E+18	0.8242	0.0009	0.0034	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
W-183m	5.2500	s	1.33	1.6360E+11	0.5838	0.1276	0.0000	0.0000	0.0000
C-14	5701.1	y	0.53	3.6460E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	2.1929E+16	6.1501E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.9081E+16	1.4410E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	8.2354E+14	7.0356E-03	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	1.6814E+14	2.2828E-03	2.9100	0.0020	0.1449	0.0000
W-187	23.850	h	0.34	3.9238E+12	8.5614E-04	0.4476	0.2710	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.6897E+13	6.5480E-04	3.4530	0.0027	0.0716	0.0000
H-3	12.330	y	0.16	2.6333E+14	1.2678E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Ni-57	1.4950	d	0.84	3.1049E+10	4.5031E-06	1.9200	0.0044	0.1430	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0104E+11	2.2533E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2216E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	4.2280E+04	3.6596E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Al-28	2.2420	m	0.13	1.4093E-03	1.9626E-16	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	0.7868	1.9591E-16	1.3710	0.1524	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Co-58m	8.9000	h	1.12	1.6469E-08	9.6294E-24	0.0019	0.0208	0.0000	0.0000
Ta-184	8.7000	h	1.15	4.7445E-12	2.8379E-27	1.5620	0.4113	0.0000	0.0000
Ta-180	8.0810	h	0.62	3.7748E-17	2.4308E-32	0.0463	0.0297	0.0000	0.0000
Hf-180m	5.5000	h	1.82	4.3364E-29	4.0638E-44	0.9980	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 95
Total activity (Ci) = 1.94239E+05

Total number of decays = 5.25702E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 29.937
Average chain length = 1.5377

Average gamma E (MeV) = 0.12236
Average beta E (MeV) = 2.84973E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.01665068 R/hr per Ci/m2
Composite ECF per FGR table = 2.24111533 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.52946222 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 45.1341934 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	1.3807E+22	1.0804E+05	0.0328	0.0031	0.0000
W-185	75.100	d	0.40	1.0558E+22	3.0483E+04	0.0001	0.1269	0.0000
Co-58	70.860	d	0.10	4.6088E+21	1.4102E+04	0.9770	0.0036	0.0000
Fe-55	2.7351	y	0.80	2.5344E+22	5501.	0.0016	0.0038	0.0000
Fe-59	44.490	d	0.02	3.8279E+20	1866.	1.1880	0.1176	0.0000
Mn-54	312.20	d	0.01	2.6452E+21	1837.	0.8359	0.0034	0.0000
W-181	120.90	d	0.10	2.5422E+20	455.9	0.0397	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5926E+22	93.98	0.0000	0.0174	0.0000
P-32	14.270	d	0.28	5.8787E+18	89.32	0.0012	0.6949	0.0000
Ta-182	114.70	d	0.35	3.1303E+19	59.17	1.2910	0.2070	0.0000
Co-57	271.80	d	0.02	3.7390E+19	29.83	0.1252	0.0176	0.0000
Hf-181	42.380	d	0.14	3.0681E+18	15.70	0.5180	0.1204	0.0000
Co-60	5.2701	y	0.02	1.2657E+20	14.26	2.5030	0.0964	0.0000
Ta-183	5.0900	d	1.38	1.1841E+17	5.044	0.2936	0.1877	0.0000
S-35	87.310	d	0.18	9.7420E+17	2.419	0.0000	0.0486	0.0000
V-49	330.00	d	6.06	1.2309E+18	0.8088	0.0009	0.0034	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000
C-14	5701.1	y	0.53	3.6459E+21	0.3796	0.0000	0.0495	0.0000
W-183m	5.2500	s	1.33	4.8062E+10	0.1715	0.1276	0.0000	0.0000
Co-56	77.310	d	0.25	2.0230E+16	5.6736E-02	3.5800	0.0036	0.1200
Ta-179	1.6100	y	1.70	3.8668E+16	1.4258E-02	0.0273	0.0000	0.0000
P-33	25.380	d	0.16	6.4416E+14	5.5032E-03	0.0000	0.0764	0.0000
V-48	15.970	d	0.02	1.1379E+14	1.5449E-03	2.9100	0.0020	0.1449
Mn-52	5.5950	d	0.05	5.5441E+12	2.1485E-04	3.4530	0.0027	0.0716
H-3	12.330	y	0.16	2.6297E+14	1.2661E-05	0.0000	0.0057	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000
W-187	23.850	h	0.34	7.3941E+09	1.6133E-06	0.4476	0.2710	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000
Ni-57	1.4950	d	0.84	4.7952E+08	6.9547E-08	1.9200	0.0044	0.1430
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000
Si-32	132.00	y	9.85	5.0097E+11	2.2530E-09	0.0000	0.0686	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000
Hf-179n	25.050	d	1.00	4.7702E+04	4.1289E-13	0.8910	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.0954E-06	1.5255E-19	1.7790	1.2470	0.0000
Mg-28	20.900	h	0.14	6.1158E-04	1.5227E-19	1.3710	0.1524	0.0000
Co-58m	8.9000	h	1.12	8.2175E-16	4.8047E-31	0.0019	0.0208	0.0000
Ta-184	8.7000	h	1.15	1.6084E-19	9.6207E-35	1.5620	0.4113	0.0000
Ta-180	8.0810	h	0.62	3.4271E-25	2.2069E-40	0.0463	0.0297	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 95
 Total activity (Ci) = 1.62596E+05

Total number of decays = 5.30817E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 30.228
 Average chain length = 1.5377

Average gamma E (MeV) = 0.13057
 Average beta E (MeV) = 3.07652E-02
 Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.14346409 R/hr per Ci/m2
 Composite ECF per FGR table = 2.39322257 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 1.63209736 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 56.3682137 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	1.0425E+22	8.1572E+04	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	9.5183E+21	2.7481E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	4.1291E+21	1.2635E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.5147E+22	5458.	0.0016	0.0038	0.0000	0.0000
Mn-54	312.20	d	0.01	2.5800E+21	1792.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	3.2133E+20	1566.	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	2.3836E+20	427.5	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5923E+22	93.96	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	2.9249E+19	55.29	1.2910	0.2070	0.0000	0.0000
P-32	14.270	d	0.28	3.4064E+18	51.76	0.0012	0.6949	0.0000	0.0000
Co-57	271.80	d	0.02	3.6334E+19	28.98	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2605E+20	14.20	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	2.5532E+18	13.06	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	8.9108E+17	2.213	0.0000	0.0486	0.0000	0.0000
Ta-183	5.0900	d	1.38	2.5644E+16	1.092	0.2936	0.1877	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	1.2022E+18	0.7899	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6459E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	1.8291E+16	5.1300E-02	3.5800	0.0036	0.1200	0.0000
W-183m	5.2500	s	1.33	1.0409E+10	3.7142E-02	0.1276	0.0000	0.0000	0.0000
Ta-179	1.6100	y	1.70	3.8160E+16	1.4070E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	4.7397E+14	4.0492E-03	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	6.9879E+13	9.4875E-04	2.9100	0.0020	0.1449	0.0000
Mn-52	5.5950	d	0.05	1.3785E+12	5.3421E-05	3.4530	0.0027	0.0716	0.0000
H-3	12.330	y	0.16	2.6251E+14	1.2639E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0089E+11	2.2526E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-187	23.850	h	0.34	2.9231E+06	6.3778E-10	0.4476	0.2710	0.0000	0.0000
Ni-57	1.4950	d	0.84	2.6227E+06	3.8038E-10	1.9200	0.0044	0.1430	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	5.2828E+04	4.5726E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	1.4328E-10	1.9954E-23	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	7.9997E-08	1.9918E-23	1.3710	0.1524	0.0000	0.0000
Co-58m	8.9000	h	1.12	6.2422E-25	3.6498E-40	0.0019	0.0208	0.0000	0.0000
Ta-184	8.7000	h	1.15	7.5399E-29	4.4842E-44	1.5620	0.4113	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 95
Total activity (Ci) = 1.31194E+05

Total number of decays = 5.36069E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 30.527
Average chain length = 1.5377

Average gamma E (MeV) = 0.14120
Average beta E (MeV) = 3.37435E-02
Average alpha E (MeV) = 0.0000

Composite Exposure Rate Conversion Factor = 3.30659962 R/hr per Ci/m2
Composite ECF per FGR table = 2.59026194 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.76502275 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 70.3984070 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	7.3392E+21	5.7428E+04	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	8.3622E+21	2.4143E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	3.5996E+21	1.1015E+04	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.4903E+22	5405.	0.0016	0.0038	0.0000	0.0000
Mn-54	312.20	d	0.01	2.5009E+21	1737.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	2.5824E+20	1259.	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	2.1994E+20	394.4	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5919E+22	93.94	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	2.6871E+19	50.80	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	3.5057E+19	27.97	0.1252	0.0176	0.0000	0.0000
P-32	14.270	d	0.28	1.7231E+18	26.18	0.0012	0.6949	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2542E+20	14.13	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	2.0296E+18	10.38	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	7.9715E+17	1.980	0.0000	0.0486	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	1.1673E+18	0.7670	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6459E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Ta-183	5.0900	d	1.38	3.7951E+15	0.1617	0.2936	0.1877	0.0000	0.0000
Co-56	77.310	d	0.25	1.6129E+16	4.5236E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.7534E+16	1.3839E-02	0.0273	0.0000	0.0000	0.0000
W-183m	5.2500	s	1.33	1.5404E+09	5.4967E-03	0.1276	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	3.2310E+14	2.7603E-03	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	3.8009E+13	5.1605E-04	2.9100	0.0020	0.1449	0.0000
H-3	12.330	y	0.16	2.6195E+14	1.2612E-05	0.0000	0.0057	0.0000	0.0000
Mn-52	5.5950	d	0.05	2.4240E+11	9.3938E-06	3.4530	0.0027	0.0716	0.0000
Re-187	0.4351E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0079E+11	2.2522E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	3923.	5.6902E-13	1.9200	0.0044	0.1430	0.0000
Hf-179n	25.050	d	1.00	5.7352E+04	4.9642E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
W-187	23.850	h	0.34	164.3	3.5859E-14	0.4476	0.2710	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Al-28	2.2420	m	0.13	2.0241E-15	2.8188E-28	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	1.1301E-12	2.8137E-28	1.3710	0.1524	0.0000	0.0000
Os-186	0.20000E+16	y	54.99	1.000	2.9682E-34	0.0000	0.0000	0.0000	2.8000

Check of numerical solution:
Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 95
Total activity (Ci) = 1.01608E+05

Total number of decays = 5.41255E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 30.823
Average chain length = 1.5377

Average gamma E (MeV) = 0.15480
Average beta E (MeV) = 3.75834E-02
Average alpha E (MeV) = 8.17936E-39

Composite Exposure Rate Conversion Factor = 3.51331091 R/hr per Ci/m2
Composite ECF per FGR table = 2.84230781 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.93501031 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 87.9205856 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	4.7347E+21	3.7048E+04	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	7.1136E+21	2.0538E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	3.0326E+21	9280.	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.4602E+22	5340.	0.0016	0.0038	0.0000	0.0000
Mn-54	312.20	d	0.01	2.4055E+21	1671.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	1.9654E+20	957.9	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	1.9892E+20	356.7	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5914E+22	93.91	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	2.4171E+19	45.69	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	3.3525E+19	26.74	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2463E+20	14.04	2.5030	0.0964	0.0000	0.0000
P-32	14.270	d	0.28	7.3568E+17	11.18	0.0012	0.6949	0.0000	0.0000
Hf-181	42.380	d	0.14	1.5239E+18	7.797	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	6.9363E+17	1.723	0.0000	0.0486	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	1.1251E+18	0.7393	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6459E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	1.3784E+16	3.8660E-02	3.5800	0.0036	0.1200	0.0000
Ta-183	5.0900	d	1.38	3.4909E+14	1.4871E-02	0.2936	0.1877	0.0000	0.0000
Ta-179	1.6100	y	1.70	3.6767E+16	1.3556E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	2.0022E+14	1.7105E-03	0.0000	0.0764	0.0000	0.0000
W-183m	5.2500	s	1.33	1.4169E+08	5.0561E-04	0.1276	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	1.7766E+13	2.4121E-04	2.9100	0.0020	0.1449	0.0000
H-3	12.330	y	0.16	2.6124E+14	1.2578E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Mn-52	5.5950	d	0.05	2.7655E+10	1.0717E-06	3.4530	0.0027	0.0716	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0067E+11	2.2516E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.1016E+04	5.2813E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.163	1.6862E-16	1.9200	0.0044	0.1430	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
W-187	23.850	h	0.34	8.0889E-04	1.7649E-19	0.4476	0.2710	0.0000	0.0000
Os-186	0.20000E+16	y	54.99	1.000	2.9682E-34	0.0000	0.0000	0.0000	2.8000
Al-28	2.2420	m	0.13	1.7748E-21	2.4717E-34	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	9.9091E-19	2.4672E-34	1.3710	0.1524	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 95
Total activity (Ci) = 75394.

Total number of decays = 5.46166E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 31.102
Average chain length = 1.5377

Average gamma E (MeV) = 0.17167
Average beta E (MeV) = 4.23445E-02
Average alpha E (MeV) = 1.10233E-38

Composite Exposure Rate Conversion Factor = 3.76615739 R/hr per Ci/m2
Composite ECF per FGR table = 3.15497875 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.14581370 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 109.804245 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Cr-51	27.710	d	0.01	2.7388E+21	2.1431E+04	0.0328	0.0031	0.0000	0.0000
W-185	75.100	d	0.40	5.8126E+21	1.6782E+04	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	2.4482E+21	7491.	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.4232E+22	5260.	0.0016	0.0038	0.0000	0.0000
Mn-54	312.20	d	0.01	2.2914E+21	1591.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	1.3976E+20	681.1	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	1.7546E+20	314.7	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5907E+22	93.87	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	2.1177E+19	40.03	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	3.1705E+19	25.29	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2365E+20	13.93	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	1.0654E+18	5.451	0.5180	0.1204	0.0000	0.0000
P-32	14.270	d	0.28	2.5412E+17	3.861	0.0012	0.6949	0.0000	0.0000
S-35	87.310	d	0.18	5.8301E+17	1.448	0.0000	0.0486	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	1.0746E+18	0.7061	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6459E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	1.1329E+16	3.1772E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.5830E+16	1.3211E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	1.1014E+14	9.4095E-04	0.0000	0.0764	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.7730E+13	7.5527E-04	0.2936	0.1877	0.0000	0.0000
V-48	15.970	d	0.02	6.8722E+12	9.3304E-05	2.9100	0.0020	0.1449	0.0000
W-183m	5.2500	s	1.33	7.1965E+06	2.5679E-05	0.1276	0.0000	0.0000	0.0000
H-3	12.330	y	0.16	2.6036E+14	1.2535E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.8381E+09	7.1232E-08	3.4530	0.0027	0.0716	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0051E+11	2.2509E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.3683E+04	5.5122E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	4.5602E-05	6.6139E-21	1.9200	0.0044	0.1430	0.0000
W-187	23.850	h	0.34	1.9003E-10	4.1462E-26	0.4476	0.2710	0.0000	0.0000
Os-186	0.20000E+16	y	54.99	1.000	2.9682E-34	0.0000	0.0000	0.0000	2.8000
Al-28	2.2420	m	0.13	4.8350E-29	6.7332E-42	1.7790	1.2470	0.0000	0.0000
Mg-28	20.900	h	0.14	2.6995E-26	6.7220E-42	1.3710	0.1524	0.0000	0.0000

Check of numerical solution:

Initial number of atoms	=	1.142016872191543D+24
Current number of atoms	=	1.142016872191543D+24

Total number of nuclides	=	92
Total activity (Ci)	=	53736.

Total number of decays	=	5.50626E+23
Asympt number of decays	=	1.75603E+24
Percent of decays	=	31.356
Average chain length	=	1.5377

Average gamma E (MeV)	=	0.19125
Average beta E (MeV)	=	4.77885E-02
Average alpha E (MeV)	=	1.54661E-38

Composite Exposure Rate Conversion Factor	=	4.05309820	R/hr per Ci/m2
Composite ECF per FGR table	=	3.51821423	R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor	=	2.39060807	Rem/hr per Ci/m2

Bomb Component Source

Point in time = 137.134811 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-185	75.100	d	0.40	4.5167E+21	1.3040E+04	0.0001	0.1269	0.0000	0.0000
Cr-51	27.710	d	0.01	1.3825E+21	1.0817E+04	0.0328	0.0031	0.0000	0.0000
Co-58	70.860	d	0.10	1.8739E+21	5734.	0.9770	0.0036	0.0300	0.0000
Fe-55	2.7351	y	0.80	2.3776E+22	5161.	0.0016	0.0038	0.0000	0.0000
Mn-54	312.20	d	0.01	2.1565E+21	1498.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	9.1298E+19	444.9	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	1.5002E+20	269.0	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5899E+22	93.82	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	1.7953E+19	33.94	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	2.9570E+19	23.59	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2244E+20	13.79	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	6.8137E+17	3.486	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	4.6929E+17	1.165	0.0000	0.0486	0.0000	0.0000
P-32	14.270	d	0.28	6.7375E+16	1.024	0.0012	0.6949	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	1.0146E+18	0.6667	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6458E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Co-56	77.310	d	0.25	8.8665E+15	2.4867E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.4694E+16	1.2792E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	5.2214E+13	4.4607E-04	0.0000	0.0764	0.0000	0.0000
V-48	15.970	d	0.02	2.0986E+12	2.8492E-05	2.9100	0.0020	0.1449	0.0000
Ta-183	5.0900	d	1.38	4.2888E+11	1.8270E-05	0.2936	0.1877	0.0000	0.0000
H-3	12.330	y	0.16	2.5927E+14	1.2483E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.4351E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
W-183m	5.2500	s	1.33	1.7408E+05	6.2118E-07	0.1276	0.0000	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Mn-52	5.5950	d	0.05	6.2214E+07	2.4110E-09	3.4530	0.0027	0.0716	0.0000
Si-32	132.00	y	9.85	5.0031E+11	2.2500E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.5383E+04	5.6594E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.4314E-10	2.0760E-26	1.9200	0.0044	0.1430	0.0000
Os-186	0.20000E+16	y	54.99	1.000	2.9682E-34	0.0000	0.0000	0.0000	2.8000
W-187	23.850	h	0.34	9.9943E-19	2.1807E-34	0.4476	0.2710	0.0000	0.0000
He-3	0.0000	s	0.00	5.5305E+12	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 92
 Total activity (Ci) = 37137.

Total number of decays = 5.54532E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 31.579
 Average chain length = 1.5377

Average gamma E (MeV) = 0.21114
 Average beta E (MeV) = 5.30320E-02
 Average alpha E (MeV) = 2.23791E-38

Composite Exposure Rate Conversion Factor = 4.33144093 R/hr per Ci/m2
 Composite ECF per FGR table = 3.88737369 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 2.63927031 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 171.267685 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-185	75.100	d	0.40	3.2961E+21	9516.	0.0001	0.1269	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.3220E+22	5040.	0.0016	0.0038	0.0000	0.0000
Cr-51	27.710	d	0.01	5.8864E+20	4606.	0.0328	0.0031	0.0000	0.0000
Co-58	70.860	d	0.10	1.3420E+21	4106.	0.9770	0.0036	0.0300	0.0000
Mn-54	312.20	d	0.01	1.9991E+21	1388.	0.8359	0.0034	0.0000	0.0000
Fe-59	44.490	d	0.02	5.3643E+19	261.4	1.1880	0.1176	0.0000	0.0000
W-181	120.90	d	0.10	1.2335E+20	221.2	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5889E+22	93.76	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	1.4607E+19	27.61	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	2.7105E+19	21.62	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.2095E+20	13.62	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	3.8988E+17	1.995	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	3.5790E+17	0.8888	0.0000	0.0486	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	9.4444E+17	0.6205	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6458E+21	0.3796	0.0000	0.0495	0.0000	0.0000
P-32	14.270	d	0.28	1.2837E+16	0.1950	0.0012	0.6949	0.0000	0.0000
Co-56	77.310	d	0.25	6.5290E+15	1.8311E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.3326E+16	1.2288E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	2.0556E+13	1.7561E-04	0.0000	0.0764	0.0000	0.0000
H-3	12.330	y	0.16	2.5791E+14	1.2417E-05	0.0000	0.0057	0.0000	0.0000
V-48	15.970	d	0.02	4.7701E+11	6.4764E-06	2.9100	0.0020	0.1449	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Ta-183	5.0900	d	1.38	4.1084E+09	1.7501E-07	0.2936	0.1877	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
W-183m	5.2500	s	1.33	1668.	5.9504E-09	0.1276	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	5.0007E+11	2.2489E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Mn-52	5.5950	d	0.05	9.0661E+05	3.5134E-11	3.4530	0.0027	0.0716	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.6303E+04	5.7390E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ni-57	1.4950	d	0.84	1.9180E-17	2.7817E-33	1.9200	0.0044	0.1430	0.0000
Os-186	0.20000E+16	y	54.99	1.000	2.9682E-34	0.0000	0.0000	0.0000	2.8000
W-187	23.850	h	0.34	4.5721E-29	9.8091E-45	0.4476	0.2710	0.0000	0.0000
He-3	0.0000	s	0.00	6.8890E+12	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 92
 Total activity (Ci) = 25301.

Total number of decays = 5.57875E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 31.769
 Average chain length = 1.5377

Average gamma E (MeV) = 0.22630
 Average beta E (MeV) = 5.62777E-02
 Average alpha E (MeV) = 3.28480E-38

Composite Exposure Rate Conversion Factor = 4.51676416 R/hr per Ci/m2
 Composite ECF per FGR table = 4.16886759 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 2.82876492 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 213.896667 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
W-185	75.100	d	0.40	2.2240E+21	6421.	0.0001	0.1269	0.0000	0.0000
Fe-55	2.7351	y	0.80	2.2543E+22	4893.	0.0016	0.0038	0.0000	0.0000
Co-58	70.860	d	0.10	8.8439E+20	2706.	0.9770	0.0036	0.0300	0.0000
Cr-51	27.710	d	0.01	2.0265E+20	1586.	0.0328	0.0031	0.0000	0.0000
Mn-54	312.20	d	0.01	1.8186E+21	1263.	0.8359	0.0034	0.0000	0.0000
W-181	120.90	d	0.10	9.6607E+19	173.3	0.0397	0.0000	0.0000	0.0000
Fe-59	44.490	d	0.02	2.7610E+19	134.6	1.1880	0.1176	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5876E+22	93.68	0.0000	0.0174	0.0000	0.0000
Ta-182	114.70	d	0.35	1.1289E+19	21.34	1.2910	0.2070	0.0000	0.0000
Co-57	271.80	d	0.02	2.4313E+19	19.40	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.1910E+20	13.42	2.5030	0.0964	0.0000	0.0000
Hf-181	42.380	d	0.14	1.9415E+17	0.9933	0.5180	0.1204	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
S-35	87.310	d	0.18	2.5514E+17	0.6336	0.0000	0.0486	0.0000	0.0000
V-49	330.00	d	6.06	8.6355E+17	0.5674	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6457E+21	0.3796	0.0000	0.0495	0.0000	0.0000
P-32	14.270	d	0.28	1.6188E+15	2.4596E-02	0.0012	0.6949	0.0000	0.0000
Co-56	77.310	d	0.25	4.4551E+15	1.2495E-02	3.5800	0.0036	0.1200	0.0000
Ta-179	1.6100	y	1.70	3.1693E+16	1.1686E-02	0.0273	0.0000	0.0000	0.0000
P-33	25.380	d	0.16	6.4168E+12	5.4820E-05	0.0000	0.0764	0.0000	0.0000
H-3	12.330	y	0.16	2.5622E+14	1.2336E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
V-48	15.970	d	0.02	7.4986E+10	1.0181E-06	2.9100	0.0020	0.1449	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	4.9976E+11	2.2475E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.2375E+07	5.2714E-10	0.2936	0.1877	0.0000	0.0000
W-183m	5.2500	s	1.33	5.023	1.7923E-11	0.1276	0.0000	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.6708E+04	5.7740E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
Mn-52	5.5950	d	0.05	4611.	1.7871E-13	3.4530	0.0027	0.0716	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Os-186	0.20000E+16	y	54.99	2.000	5.9364E-34	0.0000	0.0000	0.0000	2.8000
Ni-57	1.4950	d	0.84	5.0022E-26	7.2545E-42	1.9200	0.0044	0.1430	0.0000
He-3	0.0000	s	0.00	8.5756E+12	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	8.1675E+14	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 92
Total activity (Ci) = 17328.

Total number of decays = 5.60722E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 31.931
Average chain length = 1.5377

Average gamma E (MeV) = 0.23034
Average beta E (MeV) = 5.52413E-02
Average alpha E (MeV) = 9.59253E-38

Composite Exposure Rate Conversion Factor = 4.50545120 R/hr per Ci/m2
Composite ECF per FGR table = 4.24384212 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.87919307 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 267.136078 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	2.1726E+22	4716.	0.0016	0.0038	0.0000	0.0000
W-185	75.100	d	0.40	1.3606E+21	3928.	0.0001	0.1269	0.0000	0.0000
Co-58	70.860	d	0.10	5.2537E+20	1608.	0.9770	0.0036	0.0300	0.0000
Mn-54	312.20	d	0.01	1.6158E+21	1122.	0.8359	0.0034	0.0000	0.0000
Cr-51	27.710	d	0.01	5.3502E+19	418.6	0.0328	0.0031	0.0000	0.0000
W-181	120.90	d	0.10	7.1195E+19	127.7	0.0397	0.0000	0.0000	0.0000
Ni-63	100.60	y	1.39	1.5860E+22	93.59	0.0000	0.0174	0.0000	0.0000
Fe-59	44.490	d	0.02	1.2046E+19	58.71	1.1880	0.1176	0.0000	0.0000
Co-57	271.80	d	0.02	2.1226E+19	16.93	0.1252	0.0176	0.0000	0.0000
Ta-182	114.70	d	0.35	8.1837E+18	15.47	1.2910	0.2070	0.0000	0.0000
Co-60	5.2701	y	0.02	1.1684E+20	13.16	2.5030	0.0964	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	7.7219E+17	0.5074	0.0009	0.0034	0.0000	0.0000
Hf-181	42.380	d	0.14	8.1277E+16	0.4158	0.5180	0.1204	0.0000	0.0000
S-35	87.310	d	0.18	1.6719E+17	0.4152	0.0000	0.0486	0.0000	0.0000
C-14	5701.1	y	0.53	3.6457E+21	0.3796	0.0000	0.0495	0.0000	0.0000
Ta-179	1.6100	y	1.70	2.9765E+16	1.0975E-02	0.0273	0.0000	0.0000	0.0000
Co-56	77.310	d	0.25	2.7641E+15	7.7523E-03	3.5800	0.0036	0.1200	0.0000
P-32	14.270	d	0.28	1.2192E+14	1.8525E-03	0.0012	0.6949	0.0000	0.0000
P-33	25.380	d	0.16	1.4992E+12	1.2808E-05	0.0000	0.0764	0.0000	0.0000
H-3	12.330	y	0.16	2.5413E+14	1.2235E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
V-48	15.970	d	0.02	7.4376E+09	1.0098E-07	2.9100	0.0020	0.1449	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	4.9938E+11	2.2458E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.6847E+04	5.7860E-13	0.8910	0.0000	0.0000	0.0000
Ta-183	5.0900	d	1.38	8788.	3.7434E-13	0.2936	0.1877	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
W-183m	5.2500	s	1.33	3.5669E-03	1.2728E-14	0.1276	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Mn-52	5.5950	d	0.05	6.301	2.4417E-16	3.4530	0.0027	0.0716	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Os-186	0.20000E+16	y	54.99	2.000	5.9364E-34	0.0000	0.0000	0.0000	2.8000
He-3	0.0000	s	0.00	1.0667E+13	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	8.1675E+14	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 90
Total activity (Ci) = 12120.

Total number of decays = 5.63180E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 32.071
Average chain length = 1.5377

Average gamma E (MeV) = 0.21952
Average beta E (MeV) = 4.85901E-02
Average alpha E (MeV) = 1.37140E-37

Composite Exposure Rate Conversion Factor = 4.23963594 R/hr per Ci/m2
Composite ECF per FGR table = 4.04268932 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.74398255 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 333.626343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	2.0746E+22	4503.	0.0016	0.0038	0.0000	0.0000
W-185	75.100	d	0.40	7.3655E+20	2127.	0.0001	0.1269	0.0000	0.0000
Mn-54	312.20	d	0.01	1.3941E+21	968.2	0.8359	0.0034	0.0000	0.0000
Co-58	70.860	d	0.10	2.7416E+20	838.9	0.9770	0.0036	0.0300	0.0000
Ni-63	100.60	y	1.39	1.5840E+22	93.47	0.0000	0.0174	0.0000	0.0000
W-181	120.90	d	0.10	4.8629E+19	87.21	0.0397	0.0000	0.0000	0.0000
Cr-51	27.710	d	0.01	1.0140E+19	79.35	0.0328	0.0031	0.0000	0.0000
Fe-59	44.490	d	0.02	4.2752E+18	20.84	1.1880	0.1176	0.0000	0.0000
Co-57	271.80	d	0.02	1.7916E+19	14.29	0.1252	0.0176	0.0000	0.0000
Co-60	5.2701	y	0.02	1.1408E+20	12.85	2.5030	0.0964	0.0000	0.0000
Ta-182	114.70	d	0.35	5.4758E+18	10.35	1.2910	0.2070	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
V-49	330.00	d	6.06	6.7154E+17	0.4412	0.0009	0.0034	0.0000	0.0000
C-14	5701.1	y	0.53	3.6456E+21	0.3796	0.0000	0.0495	0.0000	0.0000
S-35	87.310	d	0.18	9.8623E+16	0.2449	0.0000	0.0486	0.0000	0.0000
Hf-181	42.380	d	0.14	2.7396E+16	0.1402	0.5180	0.1204	0.0000	0.0000
Ta-179	1.6100	y	1.70	2.7522E+16	1.0148E-02	0.0273	0.0000	0.0000	0.0000
Co-56	77.310	d	0.25	1.5228E+15	4.2710E-03	3.5800	0.0036	0.1200	0.0000
P-32	14.270	d	0.28	4.8246E+12	7.3307E-05	0.0012	0.6949	0.0000	0.0000
H-3	12.330	y	0.16	2.5155E+14	1.2111E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
P-33	25.380	d	0.16	2.4390E+11	2.0837E-06	0.0000	0.0764	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
V-48	15.970	d	0.02	4.1506E+08	5.6353E-09	2.9100	0.0020	0.1449	0.0000
Si-32	132.00	y	9.85	4.9890E+11	2.2437E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.6881E+04	5.7891E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.027	4.3746E-17	0.2936	0.1877	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
W-183m	5.2500	s	1.33	4.1683E-07	1.4874E-18	0.1276	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Mn-52	5.5950	d	0.05	1.6671E-03	6.4608E-20	3.4530	0.0027	0.0716	0.0000
Os-186	0.20000E+16	y	54.99	3.000	8.9045E-34	0.0000	0.0000	0.0000	2.8000
He-3	0.0000	s	0.00	1.3254E+13	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	8.1675E+14	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 89
Total activity (Ci) = 8757.0

Total number of decays = 5.65359E+23
Asympt number of decays = 1.75603E+24
Percent of decays = 32.195
Average chain length = 1.5377

Average gamma E (MeV) = 0.19581
Average beta E (MeV) = 3.72797E-02
Average alpha E (MeV) = 2.84718E-37

Composite Exposure Rate Conversion Factor = 3.75465059 R/hr per Ci/m2
Composite ECF per FGR table = 3.60145903 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.44765687 Rem/hr per Ci/m2

Bomb Component Source

Point in time = 1.14079583 yrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Fe-55	2.7351	y	0.80	1.9584E+22	4251.	0.0016	0.0038	0.0000	0.0000
W-185	75.100	d	0.40	3.4225E+20	988.1	0.0001	0.1269	0.0000	0.0000
Mn-54	312.20	d	0.01	1.1594E+21	805.2	0.8359	0.0034	0.0000	0.0000
Co-58	70.860	d	0.10	1.2168E+20	372.3	0.9770	0.0036	0.0300	0.0000
Ni-63	100.60	y	1.39	1.5815E+22	93.32	0.0000	0.0174	0.0000	0.0000
W-181	120.90	d	0.10	3.0209E+19	54.18	0.0397	0.0000	0.0000	0.0000
Co-60	5.2701	y	0.02	1.1072E+20	12.47	2.5030	0.0964	0.0000	0.0000
Co-57	271.80	d	0.02	1.4496E+19	11.56	0.1252	0.0176	0.0000	0.0000
Cr-51	27.710	d	0.01	1.2704E+18	9.940	0.0328	0.0031	0.0000	0.0000
Ta-182	114.70	d	0.35	3.3152E+18	6.267	1.2910	0.2070	0.0000	0.0000
Fe-59	44.490	d	0.02	1.1724E+18	5.714	1.1880	0.1176	0.0000	0.0000
Ni-59	75992.	y	6.58	1.0250E+23	0.8007	0.0026	0.0041	0.0000	0.0000
C-14	5701.1	y	0.53	3.6455E+21	0.3796	0.0000	0.0495	0.0000	0.0000
V-49	330.00	d	6.06	5.6405E+17	0.3706	0.0009	0.0034	0.0000	0.0000
S-35	87.310	d	0.18	5.1011E+16	0.1267	0.0000	0.0486	0.0000	0.0000
Hf-181	42.380	d	0.14	7.0443E+15	3.6040E-02	0.5180	0.1204	0.0000	0.0000
Ta-179	1.6100	y	1.70	2.4955E+16	9.2015E-03	0.0273	0.0000	0.0000	0.0000
Co-56	77.310	d	0.25	7.2329E+14	2.0285E-03	3.5800	0.0036	0.1200	0.0000
H-3	12.330	y	0.16	2.4835E+14	1.1957E-05	0.0000	0.0057	0.0000	0.0000
Re-187	0.43511E+11	y	2.99	3.4760E+23	4.7425E-06	0.0000	0.0007	0.0000	0.0000
Mn-53	0.36791E+07	y	5.71	1.0777E+19	1.7389E-06	0.0013	0.0038	0.0000	0.0000
P-32	14.270	d	0.28	8.5592E+10	1.3005E-06	0.0012	0.6949	0.0000	0.0000
P-33	25.380	d	0.16	2.5251E+10	2.1572E-07	0.0000	0.0764	0.0000	0.0000
Be-10	0.16000E+07	y	12.50	2.3340E+17	8.6597E-08	0.0001	0.2030	0.0000	0.0000
Hf-182	0.89992E+07	y	22.22	3.8979E+17	2.5713E-08	0.2389	0.0000	0.0000	0.0000
Si-32	132.00	y	9.85	4.9831E+11	2.2410E-09	0.0000	0.0686	0.0000	0.0000
Fe-60	0.15000E+07	y	20.00	3.1730E+15	1.2557E-09	0.0012	0.0511	0.0000	0.0000
Co-60m	10.470	m	0.38	4.2109E+04	1.2557E-09	0.0066	0.0536	0.0000	0.0000
V-48	15.970	d	0.02	1.1293E+07	1.5333E-10	2.9100	0.0020	0.1449	0.0000
W-183	0.11000E+18	y	0.00	3.2217E+23	1.7386E-12	0.0000	0.0000	0.0000	0.0000
Hf-179m	18.670	s	0.21	0.5770	5.7896E-13	0.2370	0.0000	0.0000	0.0000
Hf-179n	25.050	d	1.00	6.6887E+04	5.7896E-13	0.8910	0.0000	0.0000	0.0000
W-184	0.39991E+18	y	0.00	1.6040E+23	2.3811E-13	0.0000	0.0000	0.0000	0.0000
V-50	0.14000E+18	y	28.56	4.9480E+20	2.0981E-15	1.4210	0.0130	0.0000	0.0000
Ta-180m	0.18000E+16	y	33.33	4.7537E+16	1.5678E-17	0.0000	0.0000	0.0000	0.0000
W-186	0.59001E+18	y	0.00	4.8950E+18	4.9252E-18	0.0000	0.0000	0.0000	0.0000
Cr-50	0.18000E+18	y	0.00	3.5570E+17	1.1731E-18	0.0000	0.0000	0.0000	0.0000
Ta-183	5.0900	d	1.38	1.2601E-05	5.3679E-22	0.2936	0.1877	0.0000	0.0000
W-183m	5.2500	s	1.33	5.1148E-12	1.8251E-23	0.1276	0.0000	0.0000	0.0000
Mn-52	5.5950	d	0.05	5.6770E-08	2.2000E-24	3.4530	0.0027	0.0716	0.0000
Os-186	0.20000E+16	y	54.99	4.000	1.1873E-33	0.0000	0.0000	0.0000	2.8000
He-3	0.0000	s	0.00	1.6449E+13	0.000	0.0000	0.0000	0.0000	0.0000
He-4	0.0000	s	0.00	8.1675E+14	0.000	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.142016872191543D+24
 Current number of atoms = 1.142016872191543D+24

Total number of nuclides = 89
 Total activity (Ci) = 6611.7

Total number of decays = 5.67367E+23
 Asympt number of decays = 1.75603E+24
 Percent of decays = 32.310
 Average chain length = 1.5377

Average gamma E (MeV) = 0.16545
 Average beta E (MeV) = 2.44812E-02
 Average alpha E (MeV) = 5.02801E-37

Composite Exposure Rate Conversion Factor = 3.15756989 R/hr per Ci/m2
 Composite ECF per FGR table = 3.03608632 R/hr per Ci/m2
 Composite Whole Body Dose Conversion Factor = 2.06814933 Rem/hr per Ci/m2

Appendix D. Fission Product Source

This appendix contains a list of the fifty most-active radionuclides vs. time produced from the Hiroshima detonation. The points in time were chosen to be equally spaced in the logarithmic plane from 1×10^{-6} hours to 1×10^4 hours.

The activities that are presented are integrals over all space. The gamma and beta energies per decay listed in the table represent integrals over the emission spectrum for each radionuclide.

Fission Product Source

Point in time = 0.00000000 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900	s	1.17	5.3950E+22	2.3559E+12	1.8600	2.6600	0.0000	0.0000
Sr-96	1.0600	s	2.83	9.8170E+22	1.7350E+12	0.9320	1.9900	0.0000	0.0000
In-128m	0.10000E-01	s	70.00	5.7910E+20	1.0849E+12	1.5800	2.6200	0.0000	0.0000
Rb-95	0.38100	s	0.79	2.1380E+22	1.0513E+12	0.6120	2.3320	0.0000	0.0000
Y-98	0.59000	s	5.09	3.1830E+22	1.0107E+12	0.9070	3.7400	0.0000	0.0000
Sr-98	0.65300	s	0.31	2.5210E+22	7.2324E+11	0.1440	2.5600	0.0000	0.0000
Y-99	1.4770	s	0.34	5.3140E+22	6.7401E+11	0.8180	3.1200	0.0000	0.0000
Zr-101	2.3000	s	4.35	7.7510E+22	6.3133E+11	0.5564	2.2060	0.0000	0.0000
Zr-99	2.2000	s	4.55	7.3840E+22	6.2877E+11	0.8600	1.5500	0.0000	0.0000
Rb-96	0.19900	s	1.51	6.5750E+21	6.1897E+11	2.0300	4.0800	0.0000	0.0000
Y-100	0.73500	s	0.95	2.2680E+22	5.7807E+11	1.9610	3.6680	0.0000	0.0000
Cs-142	1.7000	s	1.18	5.1200E+22	5.6422E+11	0.6754	2.8800	0.0000	0.0000
Y-97m	1.1700	s	2.56	3.4230E+22	5.4808E+11	1.8000	2.4100	0.0000	0.0000
Nb-103	1.5000	s	13.33	4.3140E+22	5.3878E+11	0.0000	0.0000	0.0000	0.0000
Sr-99	0.27000	s	3.70	5.9770E+21	4.1471E+11	1.2720	3.2490	0.0000	0.0000
Zr-102	2.9000	s	6.90	5.2500E+22	3.3914E+11	0.2374	1.9850	0.0000	0.0000
Y-101	0.45000	s	4.44	8.1310E+21	3.3850E+11	0.9522	3.5580	0.0000	0.0000
Kr-92	1.8400	s	0.43	3.2380E+22	3.2967E+11	1.4050	1.9900	0.0000	0.0000
Rb-94	2.7020	s	0.26	4.3860E+22	3.0409E+11	2.7400	3.2400	0.0000	0.0000
Cs-143	1.7910	s	0.39	2.8930E+22	3.0261E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000	s	10.00	3.1780E+22	2.9768E+11	3.0400	2.6300	0.0000	0.0000
Nb-102	1.3000	s	15.38	2.0130E+22	2.9008E+11	0.0000	0.0000	0.0000	0.0000
Zr-100	7.1000	s	5.63	1.0760E+23	2.8391E+11	0.2589	1.3410	0.0000	0.0000
Rb-92	4.4920	s	0.45	6.1940E+22	2.5832E+11	1.3995	2.9000	0.0000	0.0000
Br-93	0.10200	s	9.80	1.4020E+21	2.5750E+11	0.1480	1.1940	0.0000	0.0000
Zr-103	1.3000	s	7.69	1.7080E+22	2.4613E+11	0.0000	0.0000	0.0000	0.0000
Xe-141	1.7300	s	0.58	2.2710E+22	2.4592E+11	0.6594	1.7940	0.0000	0.0000
Rb-93	5.8000	s	0.69	7.5990E+22	2.4544E+11	1.4200	2.7100	0.0000	0.0000
Ba-145	4.3100	s	3.71	5.2310E+22	2.2737E+11	0.3100	2.0200	0.0000	0.0000
Ba-146	2.2200	s	3.15	2.6910E+22	2.2708E+11	0.8094	1.1750	0.0000	0.0000
Xe-142	1.2200	s	1.64	1.4300E+22	2.1958E+11	0.0000	0.0000	0.0000	0.0000
Kr-94	0.21000	s	1.90	2.4320E+21	2.1695E+11	0.0000	0.0000	0.0000	0.0000
Cs-144	0.99400	s	0.40	1.0600E+22	1.9978E+11	0.0000	0.0000	0.0000	0.0000
Nb-104m	0.94000	s	4.26	9.8570E+21	1.9644E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000	s	2.11	1.7440E+22	1.7196E+11	1.3710	2.9250	0.0000	0.0000
Y-97	3.7500	s	0.80	3.4200E+22	1.7085E+11	1.8300	2.1600	0.0000	0.0000
Sb-134	0.78000	s	7.69	7.0480E+21	1.6928E+11	0.0180	3.7900	0.0000	0.0000
Kr-91	8.5700	s	0.47	6.5420E+22	1.4301E+11	1.7310	2.0880	0.0000	0.0000
Br-91	0.53800	s	2.42	4.0580E+21	1.4130E+11	0.0000	0.0000	0.0000	0.0000
Rb-97	0.16990	s	0.41	1.2720E+21	1.4025E+11	0.5630	3.3990	0.0000	0.0000
Se-89	0.41000	s	9.76	3.0680E+21	1.4018E+11	0.0000	0.0000	0.0000	0.0000
La-148	1.4280	s	0.84	1.0480E+22	1.3749E+11	1.2500	0.0369	0.0000	0.0000
Br-89	4.3700	s	1.14	3.0850E+22	1.3225E+11	1.5880	2.5100	0.0000	0.0000
Ba-147	0.89300	s	0.11	6.2320E+21	1.3074E+11	0.2887	2.3700	0.0000	0.0000
Kr-93	1.2860	s	0.78	8.6030E+21	1.2532E+11	2.1290	2.8730	0.0000	0.0000
Se-88	1.5300	s	3.92	1.0230E+22	1.2526E+11	1.0400	1.3300	0.0000	0.0000
La-147	4.0150	s	0.20	2.5640E+22	1.1963E+11	0.1836	2.0380	0.0000	0.0000
Cs-145	0.59400	s	2.19	3.6920E+21	1.1644E+11	0.4866	2.8130	0.0000	0.0000
Sr-100	0.20200	s	1.48	1.1950E+21	1.1083E+11	0.5155	3.4110	0.0000	0.0000
Kr-95	0.11400	s	2.63	6.6650E+20	1.0953E+11	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 967
Total activity (Ci) = 2.46388E+13

Total number of decays = 0.0000
Asympt number of decays = 1.62233E+25
Percent of decays = 0.0000
Average chain length = 3.5476

Average gamma E (MeV) = 0.99390
Average beta E (MeV) = 2.1302
Average alpha E (MeV) = 1.33942E-25

Composite Exposure Rate Conversion Factor = 17.8200092 R/hr per Ci/m2
Composite ECF per FGR table = 1.43229812E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.4236908 Rem/hr per Ci/m2

Fission Product Source

Point in time = 9.99999978E-03 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.3125E+22	2.3199E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.7737E+22	1.7273E+12	0.9320	1.9900	0.0000
Rb-95	0.38100 s	0.79	2.1033E+22	1.0342E+12	0.6120	2.3320	0.0000
Y-98	0.59000 s	5.09	3.1723E+22	1.0073E+12	0.9070	3.7400	0.0000
Sr-98	0.65300 s	0.31	2.4957E+22	7.1597E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.3043E+22	6.7277E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.7403E+22	6.3045E+11	0.5564	2.2060	0.0000
Zr-99	2.2000 s	4.55	7.3854E+22	6.2889E+11	0.8600	1.5500	0.0000
Rb-96	0.19900 s	1.51	6.3539E+21	5.9815E+11	2.0300	4.0800	0.0000
Y-100	0.73500 s	0.95	2.2507E+22	5.7366E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.1072E+22	5.6281E+11	0.6754	2.8800	0.0000
Y-97m	1.1700 s	2.56	3.4156E+22	5.4690E+11	1.8000	2.4100	0.0000
In-128m	0.10000E-01 s	70.00	2.8968E+20	5.4268E+11	1.5800	2.6200	0.0000
Nb-103	1.5000 s	13.33	4.3032E+22	5.3743E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.8285E+21	4.0441E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2413E+22	3.3858E+11	0.2374	1.9850	0.0000
Y-101	0.45000 s	4.44	8.0137E+21	3.3361E+11	0.9522	3.5580	0.0000
Kr-92	1.8400 s	0.43	3.2332E+22	3.2918E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	4.3827E+22	3.0386E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8832E+22	3.0158E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1670E+22	2.9665E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0148E+22	2.9034E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0771E+23	2.8419E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.1966E+22	2.5843E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5946E+22	2.4530E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2629E+22	2.4505E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6998E+22	2.4495E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	1.3101E+21	2.4061E+11	0.1480	1.1940	0.0000
Ba-145	4.3100 s	3.71	5.2264E+22	2.2717E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6836E+22	2.2646E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.4222E+22	2.1839E+11	0.0000	0.0000	0.0000
Kr-94	0.21000 s	1.90	2.3534E+21	2.0994E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0530E+22	1.9845E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.7846E+21	1.9500E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.4874E+22	1.7422E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7392E+22	1.7148E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.9891E+21	1.6786E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5414E+22	1.4299E+11	1.7310	2.0880	0.0000
Br-91	0.53800 s	2.42	4.0070E+21	1.3953E+11	0.0000	0.0000	0.0000
Se-89	0.41000 s	9.76	3.0169E+21	1.3785E+11	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	1.0442E+22	1.3699E+11	1.2500	0.0369	0.0000
Rb-97	0.16990 s	0.41	1.2215E+21	1.3469E+11	0.5630	3.3990	0.0000
Br-89	4.3700 s	1.14	3.0848E+22	1.3224E+11	1.5880	2.5100	0.0000
Ba-147	0.89300 s	0.11	6.1854E+21	1.2976E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5871E+21	1.2509E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0185E+22	1.2471E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5644E+22	1.1965E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.6504E+21	1.1513E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7037E+22	1.0920E+11	0.4690	0.8533	0.0000
Sr-100	0.20200 s	1.48	1.1549E+21	1.0711E+11	0.5155	3.4110	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 1101
Total activity (Ci) = 2.39024E+13

Total number of decays = 8.96862E+21
Asympt number of decays = 1.62233E+25
Percent of decays = 5.52825E-02
Average chain length = 3.5476

Average gamma E (MeV) = 0.98139
Average beta E (MeV) = 2.1182
Average alpha E (MeV) = 1.38068E-25

Composite Exposure Rate Conversion Factor = 17.5887318 R/hr per Ci/m2
Composite ECF per FGR table = 1.48796570E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.2673798 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.55975576E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.2668E+22	2.2999E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.7493E+22	1.7230E+12	0.9320	1.9900	0.0000
Rb-95	0.38100 s	0.79	2.0840E+22	1.0247E+12	0.6120	2.3320	0.0000
Y-98	0.59000 s	5.09	3.1662E+22	1.0053E+12	0.9070	3.7400	0.0000
Sr-98	0.65300 s	0.31	2.4815E+22	7.1192E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2987E+22	6.7206E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.7342E+22	6.2996E+11	0.5564	2.2060	0.0000
Zr-99	2.2000 s	4.55	7.3862E+22	6.2896E+11	0.8600	1.5500	0.0000
Rb-96	0.19900 s	1.51	6.2333E+21	5.8680E+11	2.0300	4.0800	0.0000
Y-100	0.73500 s	0.95	2.2410E+22	5.7119E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.1001E+22	5.6202E+11	0.6754	2.8800	0.0000
Y-97m	1.1700 s	2.56	3.4114E+22	5.4622E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2971E+22	5.3667E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.7468E+21	3.9874E+11	1.2720	3.2490	0.0000
In-128m	0.10000E-01 s	70.00	1.9661E+20	3.6832E+11	1.5800	2.6200	0.0000
Zr-102	2.9000 s	6.90	5.2364E+22	3.3827E+11	0.2374	1.9850	0.0000
Y-101	0.45000 s	4.44	7.9487E+21	3.3091E+11	0.9522	3.5580	0.0000
Kr-92	1.8400 s	0.43	3.2303E+22	3.2888E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	4.3807E+22	3.0373E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8777E+22	3.0100E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1609E+22	2.9607E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0158E+22	2.9049E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0776E+23	2.8434E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.1981E+22	2.5849E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5922E+22	2.4522E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2584E+22	2.4456E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6952E+22	2.4429E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	1.2612E+21	2.3164E+11	0.1480	1.1940	0.0000
Ba-145	4.3100 s	3.71	5.2238E+22	2.2706E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6794E+22	2.2610E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.4179E+22	2.1772E+11	0.0000	0.0000	0.0000
Kr-94	0.21000 s	1.90	2.3105E+21	2.0612E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0491E+22	1.9772E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.7443E+21	1.9420E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.5245E+22	1.7607E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7365E+22	1.7121E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.9563E+21	1.6707E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5410E+22	1.4298E+11	1.7310	2.0880	0.0000
Br-91	0.53800 s	2.42	3.9788E+21	1.3854E+11	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	1.0421E+22	1.3672E+11	1.2500	0.0369	0.0000
Se-89	0.41000 s	9.76	2.9887E+21	1.3656E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	3.0847E+22	1.3224E+11	1.5880	2.5100	0.0000
Rb-97	0.16990 s	0.41	1.1941E+21	1.3167E+11	0.5630	3.3990	0.0000
Ba-147	0.89300 s	0.11	6.1595E+21	1.2922E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5773E+21	1.2495E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0160E+22	1.2441E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5646E+22	1.1966E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.6274E+21	1.1440E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7058E+22	1.0924E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.3047E+22	1.0627E+11	0.4984	2.5300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867391D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.36198E+13

Total number of decays = 1.38886E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 8.56092E-02
Average chain length = 3.5476

Average gamma E (MeV) = 0.97720
Average beta E (MeV) = 2.1139
Average alpha E (MeV) = 1.39720E-25

Composite Exposure Rate Conversion Factor = 17.5115528 R/hr per Ci/m2
Composite ECF per FGR table = 1.51235135E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.2150145 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.94798186E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.2354E+22	2.2862E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.7323E+22	1.7200E+12	0.9320	1.9900	0.0000
Rb-95	0.38100 s	0.79	2.0707E+22	1.0182E+12	0.6120	2.3320	0.0000
Y-98	0.59000 s	5.09	3.1620E+22	1.0040E+12	0.9070	3.7400	0.0000
Sr-98	0.65300 s	0.31	2.4718E+22	7.0913E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2947E+22	6.7156E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.7300E+22	6.2961E+11	0.5564	2.2060	0.0000
Zr-99	2.2000 s	4.55	7.3867E+22	6.2900E+11	0.8600	1.5500	0.0000
Rb-96	0.19900 s	1.51	6.1510E+21	5.7905E+11	2.0300	4.0800	0.0000
Y-100	0.73500 s	0.95	2.2343E+22	5.6949E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.0951E+22	5.6148E+11	0.6754	2.8800	0.0000
Y-97m	1.1700 s	2.56	3.4085E+22	5.4575E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2929E+22	5.3615E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.6908E+21	3.9485E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2331E+22	3.3805E+11	0.2374	1.9850	0.0000
Y-101	0.45000 s	4.44	7.9038E+21	3.2904E+11	0.9522	3.5580	0.0000
Kr-92	1.8400 s	0.43	3.2282E+22	3.2867E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	4.3793E+22	3.0363E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8739E+22	3.0060E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1566E+22	2.9568E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0165E+22	2.9059E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0780E+23	2.8445E+11	0.2589	1.3410	0.0000
In-128m	0.10000E-01 s	70.00	1.5028E+20	2.8153E+11	1.5800	2.6200	0.0000
Rb-92	4.4920 s	0.45	6.1991E+22	2.5853E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5905E+22	2.4517E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2553E+22	2.4422E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6921E+22	2.4384E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2220E+22	2.2698E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6765E+22	2.2586E+11	0.8094	1.1750	0.0000
Br-93	0.10200 s	9.80	1.2285E+21	2.2562E+11	0.1480	1.1940	0.0000
Xe-142	1.2200 s	1.64	1.4149E+22	2.1726E+11	0.0000	0.0000	0.0000
Kr-94	0.21000 s	1.90	2.2813E+21	2.0351E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0464E+22	1.9721E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.7164E+21	1.9364E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.5500E+22	1.7735E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7346E+22	1.7103E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.9337E+21	1.6653E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5408E+22	1.4298E+11	1.7310	2.0880	0.0000
Br-91	0.53800 s	2.42	3.9593E+21	1.3787E+11	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	1.0407E+22	1.3652E+11	1.2500	0.0369	0.0000
Se-89	0.41000 s	9.76	2.9692E+21	1.3567E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	3.0846E+22	1.3223E+11	1.5880	2.5100	0.0000
Rb-97	0.16990 s	0.41	1.1755E+21	1.2961E+11	0.5630	3.3990	0.0000
Ba-147	0.89300 s	0.11	6.1416E+21	1.2884E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5702E+21	1.2485E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0143E+22	1.2420E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5647E+22	1.1967E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.6114E+21	1.1390E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7072E+22	1.0926E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.3034E+22	1.0616E+11	0.4984	2.5300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867392D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.34584E+13

Total number of decays = 1.72696E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.10645
Average chain length = 3.5476

Average gamma E (MeV) = 0.97507
Average beta E (MeV) = 2.1116
Average alpha E (MeV) = 1.40681E-25

Composite Exposure Rate Conversion Factor = 17.4724712 R/hr per Ci/m2
Composite ECF per FGR table = 1.52737470E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.1883974 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.43283808E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.1963E+22	2.2691E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.7110E+22	1.7163E+12	0.9320	1.9900	0.0000
Rb-95	0.38100 s	0.79	2.0542E+22	1.0101E+12	0.6120	2.3320	0.0000
Y-98	0.59000 s	5.09	3.1567E+22	1.0023E+12	0.9070	3.7400	0.0000
Sr-98	0.65300 s	0.31	2.4597E+22	7.0564E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2898E+22	6.7093E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.7247E+22	6.2918E+11	0.5564	2.2060	0.0000
Zr-99	2.2000 s	4.55	7.3874E+22	6.2906E+11	0.8600	1.5500	0.0000
Rb-96	0.19900 s	1.51	6.0497E+21	5.6952E+11	2.0300	4.0800	0.0000
Y-100	0.73500 s	0.95	2.2260E+22	5.6736E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.0890E+22	5.6079E+11	0.6754	2.8800	0.0000
Y-97m	1.1700 s	2.56	3.4047E+22	5.4516E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2877E+22	5.3549E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.6216E+21	3.9005E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2288E+22	3.3777E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	3.2255E+22	3.2840E+11	1.4050	1.9900	0.0000
Y-101	0.45000 s	4.44	7.8481E+21	3.2672E+11	0.9522	3.5580	0.0000
Rb-94	2.7020 s	0.26	4.3775E+22	3.0350E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8691E+22	3.0011E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1513E+22	2.9518E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0173E+22	2.9071E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0785E+23	2.8458E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2004E+22	2.5858E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5884E+22	2.4510E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2514E+22	2.4380E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6881E+22	2.4327E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2198E+22	2.2688E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6729E+22	2.2556E+11	0.8094	1.1750	0.0000
Br-93	0.10200 s	9.80	1.1887E+21	2.1832E+11	0.1480	1.1940	0.0000
Xe-142	1.2200 s	1.64	1.4111E+22	2.1668E+11	0.0000	0.0000	0.0000
In-128m	0.10000E-01 s	70.00	1.0746E+20	2.0131E+11	1.5800	2.6200	0.0000
Kr-94	0.21000 s	1.90	2.2452E+21	2.0029E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0430E+22	1.9657E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.6817E+21	1.9295E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.5817E+22	1.7893E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7323E+22	1.7080E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.9055E+21	1.6585E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5404E+22	1.4297E+11	1.7310	2.0880	0.0000
Br-91	0.53800 s	2.42	3.9351E+21	1.3702E+11	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	1.0389E+22	1.3629E+11	1.2500	0.0369	0.0000
Se-89	0.41000 s	9.76	2.9452E+21	1.3457E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	3.0845E+22	1.3223E+11	1.5880	2.5100	0.0000
Ba-147	0.89300 s	0.11	6.1193E+21	1.2837E+11	0.2887	2.3700	0.0000
Rb-97	0.16990 s	0.41	1.1526E+21	1.2709E+11	0.5630	3.3990	0.0000
Kr-93	1.2860 s	0.78	8.5609E+21	1.2471E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0122E+22	1.2393E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5649E+22	1.1968E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.5917E+21	1.1327E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7089E+22	1.0929E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.3017E+22	1.0602E+11	0.4984	2.5300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.32855E+13

Total number of decays = 2.14620E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.13229
Average chain length = 3.5476

Average gamma E (MeV) = 0.97307
Average beta E (MeV) = 2.1092
Average alpha E (MeV) = 1.41726E-25

Composite Exposure Rate Conversion Factor = 17.4358768 R/hr per Ci/m2
Composite ECF per FGR table = 1.54454680E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.1633501 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.03837620E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.1479E+22	2.2480E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.6843E+22	1.7115E+12	0.9320	1.9900	0.0000
Y-98	0.59000 s	5.09	3.1500E+22	1.0002E+12	0.9070	3.7400	0.0000
Rb-95	0.38100 s	0.79	2.0337E+22	9.9998E+11	0.6120	2.3320	0.0000
Sr-98	0.65300 s	0.31	2.4446E+22	7.0131E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2834E+22	6.7013E+11	0.8180	3.1200	0.0000
Zr-99	2.2000 s	4.55	7.3882E+22	6.2913E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	7.7180E+22	6.2864E+11	0.5564	2.2060	0.0000
Y-100	0.73500 s	0.95	2.2155E+22	5.6470E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.0812E+22	5.5994E+11	0.6754	2.8800	0.0000
Rb-96	0.19900 s	1.51	5.9256E+21	5.5783E+11	2.0300	4.0800	0.0000
Y-97m	1.1700 s	2.56	3.4001E+22	5.4441E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2811E+22	5.3468E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.5362E+21	3.8413E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2235E+22	3.3743E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	3.2220E+22	3.2805E+11	1.4050	1.9900	0.0000
Y-101	0.45000 s	4.44	7.7790E+21	3.2384E+11	0.9522	3.5580	0.0000
Rb-94	2.7020 s	0.26	4.3751E+22	3.0334E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8632E+22	2.9949E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1447E+22	2.9456E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0184E+22	2.9086E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0792E+23	2.8474E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2019E+22	2.5865E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5857E+22	2.4502E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2465E+22	2.4327E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6832E+22	2.4255E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2169E+22	2.2676E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6684E+22	2.2518E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.4064E+22	2.1596E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	1.1409E+21	2.0953E+11	0.1480	1.1940	0.0000
Kr-94	0.21000 s	1.90	2.2010E+21	1.9634E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0388E+22	1.9578E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.6386E+21	1.9209E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.6208E+22	1.8088E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7293E+22	1.7051E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.8705E+21	1.6501E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5400E+22	1.4296E+11	1.7310	2.0880	0.0000
La-148	1.4280 s	0.84	1.0366E+22	1.3599E+11	1.2500	0.0369	0.0000
Br-91	0.53800 s	2.42	3.9051E+21	1.3598E+11	0.0000	0.0000	0.0000
Se-89	0.41000 s	9.76	2.9153E+21	1.3321E+11	0.0000	0.0000	0.0000
In-128m	0.10000E-01 s	70.00	7.0710E+19	1.3247E+11	1.5800	2.6200	0.0000
Br-89	4.3700 s	1.14	3.0843E+22	1.3222E+11	1.5880	2.5100	0.0000
Ba-147	0.89300 s	0.11	6.0915E+21	1.2779E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5487E+21	1.2453E+11	2.1290	2.8730	0.0000
Rb-97	0.16990 s	0.41	1.1246E+21	1.2401E+11	0.5630	3.3990	0.0000
Se-88	1.5300 s	3.92	1.0095E+22	1.2360E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5651E+22	1.1969E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.5671E+21	1.1250E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7111E+22	1.0932E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.2996E+22	1.0586E+11	0.4984	2.5300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867398D+24
Difference in atom count = -1.34E+10
Fractional difference = -2.94E-15

Total number of nuclides = 1102
Total activity (Ci) = 2.31020E+13

Total number of decays = 2.66580E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.16432
Average chain length = 3.5476

Average gamma E (MeV) = 0.97130
Average beta E (MeV) = 2.1069
Average alpha E (MeV) = 1.42851E-25

Composite Exposure Rate Conversion Factor = 17.4038277 R/hr per Ci/m2
Composite ECF per FGR table = 1.56419016E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.1412563 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.79463360E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.0881E+22	2.2219E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.6507E+22	1.7056E+12	0.9320	1.9900	0.0000
Y-98	0.59000 s	5.09	3.1416E+22	9.9753E+11	0.9070	3.7400	0.0000
Rb-95	0.38100 s	0.79	2.0084E+22	9.8750E+11	0.6120	2.3320	0.0000
Sr-98	0.65300 s	0.31	2.4258E+22	6.9594E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2753E+22	6.6911E+11	0.8180	3.1200	0.0000
Zr-99	2.2000 s	4.55	7.3891E+22	6.2921E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	7.7096E+22	6.2795E+11	0.5564	2.2060	0.0000
Y-100	0.73500 s	0.95	2.2025E+22	5.6138E+11	1.9610	3.6680	0.0000
Cs-142	1.7000 s	1.18	5.0716E+22	5.5888E+11	0.6754	2.8800	0.0000
Rb-96	0.19900 s	1.51	5.7740E+21	5.4356E+11	2.0300	4.0800	0.0000
Y-97m	1.1700 s	2.56	3.3941E+22	5.4346E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2730E+22	5.3366E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	5.4313E+21	3.7685E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2168E+22	3.3700E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	3.2175E+22	3.2759E+11	1.4050	1.9900	0.0000
Y-101	0.45000 s	4.44	7.6933E+21	3.2028E+11	0.9522	3.5580	0.0000
Rb-94	2.7020 s	0.26	4.3721E+22	3.0313E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8558E+22	2.9872E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1365E+22	2.9379E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0197E+22	2.9105E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0799E+23	2.8495E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2038E+22	2.5873E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5824E+22	2.4491E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2404E+22	2.4261E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6770E+22	2.4167E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2134E+22	2.2660E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6628E+22	2.2470E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.4006E+22	2.1507E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	1.0838E+21	1.9905E+11	0.1480	1.1940	0.0000
Cs-144	0.99400 s	0.40	1.0336E+22	1.9480E+11	0.0000	0.0000	0.0000
Kr-94	0.21000 s	1.90	2.1469E+21	1.9152E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.5850E+21	1.9102E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.6690E+22	1.8329E+11	1.8300	2.1600	0.0000
Br-90	1.9000 s	2.11	1.7256E+22	1.7014E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.8270E+21	1.6397E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5394E+22	1.4295E+11	1.7310	2.0880	0.0000
La-148	1.4280 s	0.84	1.0337E+22	1.3562E+11	1.2500	0.0369	0.0000
Br-91	0.53800 s	2.42	3.8679E+21	1.3468E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	3.0840E+22	1.3221E+11	1.5880	2.5100	0.0000
Se-89	0.41000 s	9.76	2.8785E+21	1.3153E+11	0.0000	0.0000	0.0000
Ba-147	0.89300 s	0.11	6.0570E+21	1.2707E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5327E+21	1.2430E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0061E+22	1.2319E+11	1.0400	1.3300	0.0000
Rb-97	0.16990 s	0.41	1.0907E+21	1.2026E+11	0.5630	3.3990	0.0000
La-147	4.0150 s	0.20	2.5653E+22	1.1970E+11	0.1836	2.0380	0.0000
Cs-145	0.59400 s	2.19	3.5366E+21	1.1154E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7138E+22	1.0937E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.2971E+22	1.0565E+11	0.4984	2.5300	0.0000
Ba-143	14.500 s	2.07	7.9101E+22	1.0220E+11	0.2310	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867377D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.29067E+13

Total number of decays = 3.30943E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.20399
Average chain length = 3.5476

Average gamma E (MeV) = 0.96986
Average beta E (MeV) = 2.1047
Average alpha E (MeV) = 1.44069E-25

Composite Exposure Rate Conversion Factor = 17.3779545 R/hr per Ci/m2
Composite ECF per FGR table = 1.58686992E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.1232023 Rem/hr per Ci/m2

Fission Product Source

Point in time = 4.73912507E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	5.0142E+22	2.1896E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.6084E+22	1.6981E+12	0.9320	1.9900	0.0000
Y-98	0.59000 s	5.09	3.1310E+22	9.9417E+11	0.9070	3.7400	0.0000
Rb-95	0.38100 s	0.79	1.9770E+22	9.7209E+11	0.6120	2.3320	0.0000
Sr-98	0.65300 s	0.31	2.4026E+22	6.8926E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2650E+22	6.6780E+11	0.8180	3.1200	0.0000
Zr-99	2.2000 s	4.55	7.3903E+22	6.2931E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	7.6989E+22	6.2708E+11	0.5564	2.2060	0.0000
Cs-142	1.7000 s	1.18	5.0596E+22	5.5756E+11	0.6754	2.8800	0.0000
Y-100	0.73500 s	0.95	2.1863E+22	5.5725E+11	1.9610	3.6680	0.0000
Y-97m	1.1700 s	2.56	3.3866E+22	5.4226E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2628E+22	5.3238E+11	0.0000	0.0000	0.0000
Rb-96	0.19900 s	1.51	5.5900E+21	5.2624E+11	2.0300	4.0800	0.0000
Sr-99	0.27000 s	3.70	5.3029E+21	3.6793E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.2083E+22	3.3645E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	3.2116E+22	3.2698E+11	1.4050	1.9900	0.0000
Y-101	0.45000 s	4.44	7.5875E+21	3.1587E+11	0.9522	3.5580	0.0000
Rb-94	2.7020 s	0.26	4.3681E+22	3.0285E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8466E+22	2.9775E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1262E+22	2.9283E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0213E+22	2.9127E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0809E+23	2.8519E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2062E+22	2.5883E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5783E+22	2.4477E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2329E+22	2.4179E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6693E+22	2.4056E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2089E+22	2.2641E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6558E+22	2.2411E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.3934E+22	2.1396E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0271E+22	1.9358E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.5185E+21	1.8970E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	1.0165E+21	1.8669E+11	0.1480	1.1940	0.0000
Y-97	3.7500 s	0.80	3.7283E+22	1.8625E+11	1.8300	2.1600	0.0000
Kr-94	0.21000 s	1.90	2.0813E+21	1.8567E+11	0.0000	0.0000	0.0000
Br-90	1.9000 s	2.11	1.7210E+22	1.6969E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.7731E+21	1.6267E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5386E+22	1.4293E+11	1.7310	2.0880	0.0000
La-148	1.4280 s	0.84	1.0302E+22	1.3515E+11	1.2500	0.0369	0.0000
Br-91	0.53800 s	2.42	3.8219E+21	1.3308E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	3.0836E+22	1.3219E+11	1.5880	2.5100	0.0000
Se-89	0.41000 s	9.76	2.8332E+21	1.2946E+11	0.0000	0.0000	0.0000
Ba-147	0.89300 s	0.11	6.0141E+21	1.2617E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.5115E+21	1.2399E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	1.0020E+22	1.2269E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5656E+22	1.1971E+11	0.1836	2.0380	0.0000
Rb-97	0.16990 s	0.41	1.0497E+21	1.1574E+11	0.5630	3.3990	0.0000
Cs-145	0.59400 s	2.19	3.4989E+21	1.1035E+11	0.4866	2.8130	0.0000
Ba-144	11.500 s	1.74	6.7171E+22	1.0942E+11	0.4690	0.8533	0.0000
I-139	2.3000 s	1.30	1.2938E+22	1.0538E+11	0.4984	2.5300	0.0000
Ba-143	14.500 s	2.07	7.9170E+22	1.0229E+11	0.2310	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.26954E+13

Total number of decays = 4.10616E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.25310
Average chain length = 3.5476

Average gamma E (MeV) = 0.96876
Average beta E (MeV) = 2.1025
Average alpha E (MeV) = 1.45411E-25

Composite Exposure Rate Conversion Factor = 17.3587666 R/hr per Ci/m2
Composite ECF per FGR table = 1.61350761E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.1094465 Rem/hr per Ci/m2

Fission Product Source

Point in time = 5.91870211E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	4.9234E+22	2.1500E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.5553E+22	1.6887E+12	0.9320	1.9900	0.0000
Y-98	0.59000 s	5.09	3.1176E+22	9.8991E+11	0.9070	3.7400	0.0000
Rb-95	0.38100 s	0.79	1.9384E+22	9.5310E+11	0.6120	2.3320	0.0000
Sr-98	0.65300 s	0.31	2.3738E+22	6.8100E+11	0.1440	2.5600	0.0000
Y-99	1.4770 s	0.34	5.2518E+22	6.6611E+11	0.8180	3.1200	0.0000
Zr-99	2.2000 s	4.55	7.3916E+22	6.2942E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	7.6854E+22	6.2599E+11	0.5564	2.2060	0.0000
Cs-142	1.7000 s	1.18	5.0446E+22	5.5590E+11	0.6754	2.8800	0.0000
Y-100	0.73500 s	0.95	2.1661E+22	5.5210E+11	1.9610	3.6680	0.0000
Y-97m	1.1700 s	2.56	3.3771E+22	5.4073E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2500E+22	5.3079E+11	0.0000	0.0000	0.0000
Rb-96	0.19900 s	1.51	5.3684E+21	5.0537E+11	2.0300	4.0800	0.0000
Sr-99	0.27000 s	3.70	5.1465E+21	3.5708E+11	1.2720	3.2490	0.0000
Zr-102	2.9000 s	6.90	5.1978E+22	3.3577E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	3.2038E+22	3.2619E+11	1.4050	1.9900	0.0000
Y-101	0.45000 s	4.44	7.4571E+21	3.1044E+11	0.9522	3.5580	0.0000
Rb-94	2.7020 s	0.26	4.3628E+22	3.0249E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.8351E+22	2.9655E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	3.1135E+22	2.9163E+11	3.0400	2.6300	0.0000
Nb-102	1.3000 s	15.38	2.0232E+22	2.9156E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.0820E+23	2.8550E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2092E+22	2.5895E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5731E+22	2.4461E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.2234E+22	2.4077E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6598E+22	2.3918E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.2033E+22	2.2617E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6471E+22	2.2337E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.3844E+22	2.1258E+11	0.0000	0.0000	0.0000
Cs-144	0.99400 s	0.40	1.0191E+22	1.9206E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.8008E+22	1.8987E+11	1.8300	2.1600	0.0000
Nb-104m	0.94000 s	4.26	9.4361E+21	1.8806E+11	0.0000	0.0000	0.0000
Kr-94	0.21000 s	1.90	2.0021E+21	1.7860E+11	0.0000	0.0000	0.0000
Br-93	0.10200 s	9.80	9.3830E+20	1.7233E+11	0.1480	1.1940	0.0000
Br-90	1.9000 s	2.11	1.7153E+22	1.6912E+11	1.3710	2.9250	0.0000
Sb-134	0.78000 s	7.69	6.7064E+21	1.6107E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5375E+22	1.4291E+11	1.7310	2.0880	0.0000
La-148	1.4280 s	0.84	1.0258E+22	1.3457E+11	1.2500	0.0369	0.0000
Br-89	4.3700 s	1.14	3.0830E+22	1.3216E+11	1.5880	2.5100	0.0000
Br-91	0.53800 s	2.42	3.7653E+21	1.3111E+11	0.0000	0.0000	0.0000
Se-89	0.41000 s	9.76	2.7776E+21	1.2691E+11	0.0000	0.0000	0.0000
Ba-147	0.89300 s	0.11	5.9609E+21	1.2505E+11	0.2887	2.3700	0.0000
Kr-93	1.2860 s	0.78	8.4832E+21	1.2358E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	9.9681E+21	1.2205E+11	1.0400	1.3300	0.0000
La-147	4.0150 s	0.20	2.5658E+22	1.1972E+11	0.1836	2.0380	0.0000
Rb-97	0.16990 s	0.41	1.0006E+21	1.1033E+11	0.5630	3.3990	0.0000
Ba-144	11.500 s	1.74	6.7211E+22	1.0949E+11	0.4690	0.8533	0.0000
Cs-145	0.59400 s	2.19	3.4523E+21	1.0888E+11	0.4866	2.8130	0.0000
I-139	2.3000 s	1.30	1.2898E+22	1.0506E+11	0.4984	2.5300	0.0000
Ba-143	14.500 s	2.07	7.9255E+22	1.0240E+11	0.2310	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.24604E+13

Total number of decays = 5.09147E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.31384
Average chain length = 3.5476

Average gamma E (MeV) = 0.96794
Average beta E (MeV) = 2.1002
Average alpha E (MeV) = 1.46932E-25

Composite Exposure Rate Conversion Factor = 17.3452072 R/hr per Ci/m2
Composite ECF per FGR table = 1.64549686E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0992737 Rem/hr per Ci/m2

Fission Product Source

Point in time = 7.39187896E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900	s	1.17	4.8121E+22	2.1014E+12	1.8600	2.6600	0.0000
Sr-96	1.0600	s	2.83	9.4883E+22	1.6769E+12	0.9320	1.9900	0.0000
Y-98	0.59000	s	5.09	3.1007E+22	9.8453E+11	0.9070	3.7400	0.0000
Rb-95	0.38100	s	0.79	1.8910E+22	9.2978E+11	0.6120	2.3320	0.0000
Sr-98	0.65300	s	0.31	2.3382E+22	6.7080E+11	0.1440	2.5600	0.0000
Y-99	1.4770	s	0.34	5.2347E+22	6.6394E+11	0.8180	3.1200	0.0000
Zr-99	2.2000	s	4.55	7.3932E+22	6.2956E+11	0.8600	1.5500	0.0000
Zr-101	2.3000	s	4.35	7.6683E+22	6.2459E+11	0.5564	2.2060	0.0000
Cs-142	1.7000	s	1.18	5.0258E+22	5.5384E+11	0.6754	2.8800	0.0000
Y-100	0.73500	s	0.95	2.1410E+22	5.4569E+11	1.9610	3.6680	0.0000
Y-97m	1.1700	s	2.56	3.3649E+22	5.3878E+11	1.8000	2.4100	0.0000
Nb-103	1.5000	s	13.33	4.2341E+22	5.2881E+11	0.0000	0.0000	0.0000
Rb-96	0.19900	s	1.51	5.1037E+21	4.8046E+11	2.0300	4.0800	0.0000
Sr-99	0.27000	s	3.70	4.9574E+21	3.4396E+11	1.2720	3.2490	0.0000
Zr-102	2.9000	s	6.90	5.1844E+22	3.3491E+11	0.2374	1.9850	0.0000
Kr-92	1.8400	s	0.43	3.1935E+22	3.2515E+11	1.4050	1.9900	0.0000
Y-101	0.45000	s	4.44	7.2969E+21	3.0377E+11	0.9522	3.5580	0.0000
Rb-94	2.7020	s	0.26	4.3559E+22	3.0201E+11	2.7400	3.2400	0.0000
Cs-143	1.7910	s	0.39	2.8208E+22	2.9506E+11	0.7010	2.7600	0.0000
Nb-102	1.3000	s	15.38	2.0256E+22	2.9190E+11	0.0000	0.0000	0.0000
Y-98m	2.0000	s	10.00	3.0976E+22	2.9015E+11	3.0400	2.6300	0.0000
Zr-100	7.1000	s	5.63	1.0834E+23	2.8587E+11	0.2589	1.3410	0.0000
Rb-92	4.4920	s	0.45	6.2128E+22	2.5910E+11	1.3995	2.9000	0.0000
Rb-93	5.8000	s	0.69	7.5666E+22	2.4440E+11	1.4200	2.7100	0.0000
Xe-141	1.7300	s	0.58	2.2117E+22	2.3950E+11	0.6594	1.7940	0.0000
Zr-103	1.3000	s	7.69	1.6479E+22	2.3747E+11	0.0000	0.0000	0.0000
Ba-145	4.3100	s	3.71	5.1962E+22	2.2586E+11	0.3100	2.0200	0.0000
Ba-146	2.2200	s	3.15	2.6361E+22	2.2245E+11	0.8094	1.1750	0.0000
Xe-142	1.2200	s	1.64	1.3732E+22	2.1086E+11	0.0000	0.0000	0.0000
Y-97	3.7500	s	0.80	3.8891E+22	1.9429E+11	1.8300	2.1600	0.0000
Cs-144	0.99400	s	0.40	1.0091E+22	1.9019E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000	s	4.26	9.3341E+21	1.8602E+11	0.0000	0.0000	0.0000
Kr-94	0.21000	s	1.90	1.9073E+21	1.7015E+11	0.0000	0.0000	0.0000
Br-90	1.9000	s	2.11	1.7080E+22	1.6841E+11	1.3710	2.9250	0.0000
Sb-134	0.78000	s	7.69	6.6240E+21	1.5909E+11	0.0180	3.7900	0.0000
Br-93	0.10200	s	9.80	8.4901E+20	1.5593E+11	0.1480	1.1940	0.0000
Kr-91	8.5700	s	0.47	6.5361E+22	1.4288E+11	1.7310	2.0880	0.0000
La-148	1.4280	s	0.84	1.0203E+22	1.3385E+11	1.2500	0.0369	0.0000
Br-89	4.3700	s	1.14	3.0821E+22	1.3213E+11	1.5880	2.5100	0.0000
Br-91	0.53800	s	2.42	3.6957E+21	1.2869E+11	0.0000	0.0000	0.0000
Se-89	0.41000	s	9.76	2.7097E+21	1.2381E+11	0.0000	0.0000	0.0000
Ba-147	0.89300	s	0.11	5.8951E+21	1.2367E+11	0.2887	2.3700	0.0000
Kr-93	1.2860	s	0.78	8.4453E+21	1.2303E+11	2.1290	2.8730	0.0000
Se-88	1.5300	s	3.92	9.9038E+21	1.2126E+11	1.0400	1.3300	0.0000
La-147	4.0150	s	0.20	2.5661E+22	1.1973E+11	0.1836	2.0380	0.0000
Ba-144	11.500	s	1.74	6.7261E+22	1.0957E+11	0.4690	0.8533	0.0000
Cs-145	0.59400	s	2.19	3.3949E+21	1.0707E+11	0.4866	2.8130	0.0000
I-139	2.3000	s	1.30	1.2848E+22	1.0465E+11	0.4984	2.5300	0.0000
Rb-97	0.16990	s	0.41	9.4249E+20	1.0392E+11	0.5630	3.3990	0.0000
Ba-143	14.500	s	2.07	7.9361E+22	1.0253E+11	0.2310	1.7200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867393D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.21907E+13

Total number of decays = 6.30829E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.38884
Average chain length = 3.5476

Average gamma E (MeV) = 0.96729
Average beta E (MeV) = 2.0977
Average alpha E (MeV) = 1.48718E-25

Composite Exposure Rate Conversion Factor = 17.3350620 R/hr per Ci/m2
Composite ECF per FGR table = 1.68479290E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0911665 Rem/hr per Ci/m2

Fission Product Source

Point in time = 9.23173055E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s	1.17	4.6764E+22	2.0421E+12	1.8600	2.6600	0.0000
Sr-96	1.0600 s	2.83	9.4039E+22	1.6620E+12	0.9320	1.9900	0.0000
Y-98	0.59000 s	5.09	3.0791E+22	9.7768E+11	0.9070	3.7400	0.0000
Rb-95	0.38100 s	0.79	1.8330E+22	9.0131E+11	0.6120	2.3320	0.0000
Y-99	1.4770 s	0.34	5.2125E+22	6.6113E+11	0.8180	3.1200	0.0000
Sr-98	0.65300 s	0.31	2.2944E+22	6.5823E+11	0.1440	2.5600	0.0000
Zr-99	2.2000 s	4.55	7.3950E+22	6.2971E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	7.6466E+22	6.2282E+11	0.5564	2.2060	0.0000
Cs-142	1.7000 s	1.18	5.0025E+22	5.5127E+11	0.6754	2.8800	0.0000
Y-100	0.73500 s	0.95	2.1097E+22	5.3773E+11	1.9610	3.6680	0.0000
Y-97m	1.1700 s	2.56	3.3493E+22	5.3628E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	4.2143E+22	5.2633E+11	0.0000	0.0000	0.0000
Rb-96	0.19900 s	1.51	4.7911E+21	4.5103E+11	2.0300	4.0800	0.0000
Zr-102	2.9000 s	6.90	5.1676E+22	3.3382E+11	0.2374	1.9850	0.0000
Sr-99	0.27000 s	3.70	4.7305E+21	3.2822E+11	1.2720	3.2490	0.0000
Kr-92	1.8400 s	0.43	3.1799E+22	3.2376E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	4.3466E+22	3.0136E+11	2.7400	3.2400	0.0000
Y-101	0.45000 s	4.44	7.1011E+21	2.9562E+11	0.9522	3.5580	0.0000
Cs-143	1.7910 s	0.39	2.8031E+22	2.9320E+11	0.7010	2.7600	0.0000
Nb-102	1.3000 s	15.38	2.0285E+22	2.9231E+11	0.0000	0.0000	0.0000
Y-98m	2.0000 s	10.00	3.0779E+22	2.8831E+11	3.0400	2.6300	0.0000
Zr-100	7.1000 s	5.63	1.0851E+23	2.8632E+11	0.2589	1.3410	0.0000
Rb-92	4.4920 s	0.45	6.2173E+22	2.5929E+11	1.3995	2.9000	0.0000
Rb-93	5.8000 s	0.69	7.5584E+22	2.4413E+11	1.4200	2.7100	0.0000
Xe-141	1.7300 s	0.58	2.1971E+22	2.3791E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.6331E+22	2.3534E+11	0.0000	0.0000	0.0000
Ba-145	4.3100 s	3.71	5.1873E+22	2.2547E+11	0.3100	2.0200	0.0000
Ba-146	2.2200 s	3.15	2.6225E+22	2.2130E+11	0.8094	1.1750	0.0000
Xe-142	1.2200 s	1.64	1.3593E+22	2.0873E+11	0.0000	0.0000	0.0000
Y-97	3.7500 s	0.80	3.9959E+22	1.9962E+11	1.8300	2.1600	0.0000
Cs-144	0.99400 s	0.40	9.9681E+21	1.8787E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	9.2083E+21	1.8352E+11	0.0000	0.0000	0.0000
Br-90	1.9000 s	2.11	1.6990E+22	1.6751E+11	1.3710	2.9250	0.0000
Kr-94	0.21000 s	1.90	1.7953E+21	1.6015E+11	0.0000	0.0000	0.0000
Sb-134	0.78000 s	7.69	6.5226E+21	1.5666E+11	0.0180	3.7900	0.0000
Kr-91	8.5700 s	0.47	6.5342E+22	1.4283E+11	1.7310	2.0880	0.0000
Br-93	0.10200 s	9.80	7.4933E+20	1.3762E+11	0.1480	1.1940	0.0000
La-148	1.4280 s	0.84	1.0134E+22	1.3295E+11	1.2500	0.0369	0.0000
Br-89	4.3700 s	1.14	3.0807E+22	1.3207E+11	1.5880	2.5100	0.0000
Br-91	0.53800 s	2.42	3.6106E+21	1.2573E+11	0.0000	0.0000	0.0000
Kr-93	1.2860 s	0.78	8.3945E+21	1.2229E+11	2.1290	2.8730	0.0000
Ba-147	0.89300 s	0.11	5.8138E+21	1.2197E+11	0.2887	2.3700	0.0000
Se-88	1.5300 s	3.92	9.8240E+21	1.2029E+11	1.0400	1.3300	0.0000
Se-89	0.41000 s	9.76	2.6272E+21	1.2004E+11	0.0000	0.0000	0.0000
La-147	4.0150 s	0.20	2.5663E+22	1.1974E+11	0.1836	2.0380	0.0000
Ba-144	11.500 s	1.74	6.7321E+22	1.0967E+11	0.4690	0.8533	0.0000
Cs-145	0.59400 s	2.19	3.3246E+21	1.0485E+11	0.4866	2.8130	0.0000
I-139	2.3000 s	1.30	1.2786E+22	1.0414E+11	0.4984	2.5300	0.0000
Ba-143	14.500 s	2.07	7.9493E+22	1.0270E+11	0.2310	1.7200	0.0000
Rb-97	0.16990 s	0.41	8.7461E+20	9.6437E+10	0.5630	3.3990	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.18742E+13

Total number of decays = 7.80805E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.48129
Average chain length = 3.5476

Average gamma E (MeV) = 0.96664
Average beta E (MeV) = 2.0946
Average alpha E (MeV) = 1.50870E-25

Composite Exposure Rate Conversion Factor = 17.3253784 R/hr per Ci/m2
Composite ECF per FGR table = 1.73394792E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0830479 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.115295239 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900	s	1.17	4.5120E+22	1.9703E+12	1.8600	2.6600	0.0000
Sr-96	1.0600	s	2.83	9.2974E+22	1.6432E+12	0.9320	1.9900	0.0000
Y-98	0.59000	s	5.09	3.0517E+22	9.6897E+11	0.9070	3.7400	0.0000
Rb-95	0.38100	s	0.79	1.7627E+22	8.6674E+11	0.6120	2.3320	0.0000
Y-99	1.4770	s	0.34	5.1836E+22	6.5747E+11	0.8180	3.1200	0.0000
Sr-98	0.65300	s	0.31	2.2407E+22	6.4282E+11	0.1440	2.5600	0.0000
Zr-99	2.2000	s	4.55	7.3970E+22	6.2988E+11	0.8600	1.5500	0.0000
Zr-101	2.3000	s	4.35	7.6188E+22	6.2056E+11	0.5564	2.2060	0.0000
Cs-142	1.7000	s	1.18	4.9734E+22	5.4805E+11	0.6754	2.8800	0.0000
Y-97m	1.1700	s	2.56	3.3292E+22	5.3306E+11	1.8000	2.4100	0.0000
Y-100	0.73500	s	0.95	2.0710E+22	5.2786E+11	1.9610	3.6680	0.0000
Nb-103	1.5000	s	13.33	4.1896E+22	5.2324E+11	0.0000	0.0000	0.0000
Rb-96	0.19900	s	1.51	4.4273E+21	4.1678E+11	2.0300	4.0800	0.0000
Zr-102	2.9000	s	6.90	5.1464E+22	3.3245E+11	0.2374	1.9850	0.0000
Kr-92	1.8400	s	0.43	3.1619E+22	3.2192E+11	1.4050	1.9900	0.0000
Sr-99	0.27000	s	3.70	4.4613E+21	3.0954E+11	1.2720	3.2490	0.0000
Rb-94	2.7020	s	0.26	4.3341E+22	3.0050E+11	2.7400	3.2400	0.0000
Nb-102	1.3000	s	15.38	2.0319E+22	2.9281E+11	0.0000	0.0000	0.0000
Cs-143	1.7910	s	0.39	2.7809E+22	2.9088E+11	0.7010	2.7600	0.0000
Zr-100	7.1000	s	5.63	1.0872E+23	2.8686E+11	0.2589	1.3410	0.0000
Y-98m	2.0000	s	10.00	3.0535E+22	2.8602E+11	3.0400	2.6300	0.0000
Y-101	0.45000	s	4.44	6.8631E+21	2.8571E+11	0.9522	3.5580	0.0000
Rb-92	4.4920	s	0.45	6.2227E+22	2.5951E+11	1.3995	2.9000	0.0000
Rb-93	5.8000	s	0.69	7.5482E+22	2.4380E+11	1.4200	2.7100	0.0000
Xe-141	1.7300	s	0.58	2.1789E+22	2.3594E+11	0.6594	1.7940	0.0000
Zr-103	1.3000	s	7.69	1.6147E+22	2.3269E+11	0.0000	0.0000	0.0000
Ba-145	4.3100	s	3.71	5.1759E+22	2.2498E+11	0.3100	2.0200	0.0000
Ba-146	2.2200	s	3.15	2.6055E+22	2.1987E+11	0.8094	1.1750	0.0000
Xe-142	1.2200	s	1.64	1.3422E+22	2.0610E+11	0.0000	0.0000	0.0000
Y-97	3.7500	s	0.80	4.1241E+22	2.0603E+11	1.8300	2.1600	0.0000
Cs-144	0.99400	s	0.40	9.8163E+21	1.8501E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000	s	4.26	9.0536E+21	1.8043E+11	0.0000	0.0000	0.0000
Br-90	1.9000	s	2.11	1.6876E+22	1.6639E+11	1.3710	2.9250	0.0000
Sb-134	0.78000	s	7.69	6.3981E+21	1.5367E+11	0.0180	3.7900	0.0000
Kr-94	0.21000	s	1.90	1.6645E+21	1.4849E+11	0.0000	0.0000	0.0000
Kr-91	8.5700	s	0.47	6.5315E+22	1.4278E+11	1.7310	2.0880	0.0000
Br-89	4.3700	s	1.14	3.0788E+22	1.3198E+11	1.5880	2.5100	0.0000
La-148	1.4280	s	0.84	1.0049E+22	1.3183E+11	1.2500	0.0369	0.0000
Br-91	0.53800	s	2.42	3.5070E+21	1.2212E+11	0.0000	0.0000	0.0000
Kr-93	1.2860	s	0.78	8.3264E+21	1.2129E+11	2.1290	2.8730	0.0000
Ba-147	0.89300	s	0.11	5.7138E+21	1.1987E+11	0.2887	2.3700	0.0000
La-147	4.0150	s	0.20	2.5664E+22	1.1975E+11	0.1836	2.0380	0.0000
Se-88	1.5300	s	3.92	9.7252E+21	1.1908E+11	1.0400	1.3300	0.0000
Br-93	0.10200	s	9.80	6.4109E+20	1.1775E+11	0.1480	1.1940	0.0000
Se-89	0.41000	s	9.76	2.5276E+21	1.1549E+11	0.0000	0.0000	0.0000
Ba-144	11.500	s	1.74	6.7394E+22	1.0979E+11	0.4690	0.8533	0.0000
I-139	2.3000	s	1.30	1.2708E+22	1.0351E+11	0.4984	2.5300	0.0000
Ba-143	14.500	s	2.07	7.9655E+22	1.0291E+11	0.2310	1.7200	0.0000
Cs-145	0.59400	s	2.19	3.2386E+21	1.0214E+11	0.4866	2.8130	0.0000
I-138	6.4600	s	0.93	3.0493E+22	8.8427E+10	1.8900	2.5900	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.14989E+13

Total number of decays = 9.65167E+22
Asympt number of decays = 1.62233E+25
Percent of decays = 0.59493
Average chain length = 3.5476

Average gamma E (MeV) = 0.96583
Average beta E (MeV) = 2.0908
Average alpha E (MeV) = 1.53504E-25

Composite Exposure Rate Conversion Factor = 17.3131638 R/hr per Ci/m2
Composite ECF per FGR table = 1.79621540E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0728798 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.143992454 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900	s	1.17	4.3142E+22	1.8600	2.6600	0.0000	0.0000
Sr-96	1.0600	s	2.83	9.1630E+22	0.9320	1.9900	0.0000	0.0000
Y-98	0.59000	s	5.09	3.0166E+22	0.9070	3.7400	0.0000	0.0000
Rb-95	0.38100	s	0.79	1.6781E+22	0.6120	2.3320	0.0000	0.0000
Y-99	1.4770	s	0.34	5.1458E+22	0.8180	3.1200	0.0000	0.0000
Zr-99	2.2000	s	4.55	7.3990E+22	0.8600	1.5500	0.0000	0.0000
Sr-98	0.65300	s	0.31	2.1751E+22	0.1440	2.5600	0.0000	0.0000
Zr-101	2.3000	s	4.35	7.5832E+22	0.5564	2.2060	0.0000	0.0000
Cs-142	1.7000	s	1.18	4.9370E+22	0.6754	2.8800	0.0000	0.0000
Y-97m	1.1700	s	2.56	3.3032E+22	1.8000	2.4100	0.0000	0.0000
Nb-103	1.5000	s	13.33	4.1588E+22	0.0000	0.0000	0.0000	0.0000
Y-100	0.73500	s	0.95	2.0231E+22	1.9610	3.6680	0.0000	0.0000
Rb-96	0.19900	s	1.51	4.0110E+21	2.0300	4.0800	0.0000	0.0000
Zr-102	2.9000	s	6.90	5.1195E+22	0.2374	1.9850	0.0000	0.0000
Kr-92	1.8400	s	0.43	3.1380E+22	1.4050	1.9900	0.0000	0.0000
Rb-94	2.7020	s	0.26	4.3173E+22	2.7400	3.2400	0.0000	0.0000
Nb-102	1.3000	s	15.38	2.0360E+22	0.0000	0.0000	0.0000	0.0000
Cs-143	1.7910	s	0.39	2.7535E+22	0.7010	2.7600	0.0000	0.0000
Sr-99	0.27000	s	3.70	4.1459E+21	1.2720	3.2490	0.0000	0.0000
Zr-100	7.1000	s	5.63	1.0896E+23	0.2589	1.3410	0.0000	0.0000
Y-98m	2.0000	s	10.00	3.0233E+22	3.0400	2.6300	0.0000	0.0000
Y-101	0.45000	s	4.44	6.5758E+21	0.9522	3.5580	0.0000	0.0000
Rb-92	4.4920	s	0.45	6.2292E+22	1.3995	2.9000	0.0000	0.0000
Rb-93	5.8000	s	0.69	7.5353E+22	1.4200	2.7100	0.0000	0.0000
Xe-141	1.7300	s	0.58	2.1563E+22	0.6594	1.7940	0.0000	0.0000
Zr-103	1.3000	s	7.69	1.5919E+22	0.0000	0.0000	0.0000	0.0000
Ba-145	4.3100	s	3.71	5.1616E+22	0.3100	2.0200	0.0000	0.0000
Ba-146	2.2200	s	3.15	2.5844E+22	0.8094	1.1750	0.0000	0.0000
Y-97	3.7500	s	0.80	4.2763E+22	1.8300	2.1600	0.0000	0.0000
Xe-142	1.2200	s	1.64	1.3210E+22	0.0000	0.0000	0.0000	0.0000
Cs-144	0.99400	s	0.40	9.6297E+21	0.0000	0.0000	0.0000	0.0000
Nb-104m	0.94000	s	4.26	8.8640E+21	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000	s	2.11	1.6733E+22	1.3710	2.9250	0.0000	0.0000
Sb-134	0.78000	s	7.69	6.2460E+21	0.0180	3.7900	0.0000	0.0000
Kr-91	8.5700	s	0.47	6.5277E+22	1.7310	2.0880	0.0000	0.0000
Kr-94	0.21000	s	1.90	1.5144E+21	0.0000	0.0000	0.0000	0.0000
Br-89	4.3700	s	1.14	3.0758E+22	1.5880	2.5100	0.0000	0.0000
La-148	1.4280	s	0.84	9.9423E+21	1.2500	0.0369	0.0000	0.0000
Kr-93	1.2860	s	0.78	8.2355E+21	2.1290	2.8730	0.0000	0.0000
La-147	4.0150	s	0.20	2.5663E+22	0.1836	2.0380	0.0000	0.0000
Br-91	0.53800	s	2.42	3.3817E+21	0.0000	0.0000	0.0000	0.0000
Se-88	1.5300	s	3.92	9.6030E+21	1.0400	1.3300	0.0000	0.0000
Ba-147	0.89300	s	0.11	5.5911E+21	0.2887	2.3700	0.0000	0.0000
Se-89	0.41000	s	9.76	2.4085E+21	0.0000	0.0000	0.0000	0.0000
Ba-144	11.500	s	1.74	6.7481E+22	0.4690	0.8533	0.0000	0.0000
Ba-143	14.500	s	2.07	7.9854E+22	0.2310	1.7200	0.0000	0.0000
I-139	2.3000	s	1.30	1.2612E+22	0.4984	2.5300	0.0000	0.0000
Cs-145	0.59400	s	2.19	3.1343E+21	0.4866	2.8130	0.0000	0.0000
Br-93	0.10200	s	9.80	5.2758E+20	0.1480	1.1940	0.0000	0.0000
I-138	6.4600	s	0.93	3.0437E+22	1.8900	2.5900	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867390D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.10539E+13

Total number of decays = 1.19106E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 0.73417
Average chain length = 3.5476

Average gamma E (MeV) = 0.96470
Average beta E (MeV) = 2.0859
Average alpha E (MeV) = 1.56748E-25

Composite Exposure Rate Conversion Factor = 17.2957134 R/hr per Ci/m2
Composite ECF per FGR table = 1.87577270E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0588045 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.179832458 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s 1.17	4.0788E+22	1.7811E+12	1.8600	2.6600	0.0000	0.0000
Sr-96	1.0600 s 2.83	8.9936E+22	1.5895E+12	0.9320	1.9900	0.0000	0.0000
Y-98	0.59000 s 5.09	2.9718E+22	9.4360E+11	0.9070	3.7400	0.0000	0.0000
Rb-95	0.38100 s 0.79	1.5773E+22	7.7557E+11	0.6120	2.3320	0.0000	0.0000
Y-99	1.4770 s 0.34	5.0962E+22	6.4638E+11	0.8180	3.1200	0.0000	0.0000
Zr-99	2.2000 s 4.55	7.4007E+22	6.3020E+11	0.8600	1.5500	0.0000	0.0000
Zr-101	2.3000 s 4.35	7.5374E+22	6.1392E+11	0.5564	2.2060	0.0000	0.0000
Sr-98	0.65300 s 0.31	2.0956E+22	6.0120E+11	0.1440	2.5600	0.0000	0.0000
Cs-142	1.7000 s 1.18	4.8918E+22	5.3907E+11	0.6754	2.8800	0.0000	0.0000
Y-97m	1.1700 s 2.56	3.2696E+22	5.2351E+11	1.8000	2.4100	0.0000	0.0000
Nb-103	1.5000 s 13.33	4.1204E+22	5.1460E+11	0.0000	0.0000	0.0000	0.0000
Y-100	0.73500 s 0.95	1.9641E+22	5.0062E+11	1.9610	3.6680	0.0000	0.0000
Rb-96	0.19900 s 1.51	3.5453E+21	3.3375E+11	2.0300	4.0800	0.0000	0.0000
Zr-102	2.9000 s 6.90	5.0855E+22	3.2852E+11	0.2374	1.9850	0.0000	0.0000
Kr-92	1.8400 s 0.43	3.1064E+22	3.1627E+11	1.4050	1.9900	0.0000	0.0000
Rb-94	2.7020 s 0.26	4.2946E+22	2.9775E+11	2.7400	3.2400	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.0408E+22	2.9408E+11	0.0000	0.0000	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.0925E+23	2.8826E+11	0.2589	1.3410	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.7195E+22	2.8445E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000 s 10.00	2.9860E+22	2.7969E+11	3.0400	2.6300	0.0000	0.0000
Sr-99	0.27000 s 3.70	3.7827E+21	2.6246E+11	1.2720	3.2490	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.2368E+22	2.6010E+11	1.3995	2.9000	0.0000	0.0000
Y-101	0.45000 s 4.44	6.2324E+21	2.5946E+11	0.9522	3.5580	0.0000	0.0000
Rb-93	5.8000 s 0.69	7.5190E+22	2.4286E+11	1.4200	2.7100	0.0000	0.0000
Xe-141	1.7300 s 0.58	2.1283E+22	2.3047E+11	0.6594	1.7940	0.0000	0.0000
Zr-103	1.3000 s 7.69	1.5638E+22	2.2535E+11	0.0000	0.0000	0.0000	0.0000
Ba-145	4.3100 s 3.71	5.1432E+22	2.2355E+11	0.3100	2.0200	0.0000	0.0000
Y-97	3.7500 s 0.80	4.4545E+22	2.2253E+11	1.8300	2.1600	0.0000	0.0000
Ba-146	2.2200 s 3.15	2.5581E+22	2.1586E+11	0.8094	1.1750	0.0000	0.0000
Xe-142	1.2200 s 1.64	1.2950E+22	1.9886E+11	0.0000	0.0000	0.0000	0.0000
Cs-144	0.99400 s 0.40	9.4013E+21	1.7718E+11	0.0000	0.0000	0.0000	0.0000
Nb-104m	0.94000 s 4.26	8.6329E+21	1.7205E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000 s 2.11	1.6554E+22	1.6322E+11	1.3710	2.9250	0.0000	0.0000
Sb-134	0.78000 s 7.69	6.0611E+21	1.4557E+11	0.0180	3.7900	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.5224E+22	1.4258E+11	1.7310	2.0880	0.0000	0.0000
Br-89	4.3700 s 1.14	3.0714E+22	1.3167E+11	1.5880	2.5100	0.0000	0.0000
La-148	1.4280 s 0.84	9.8100E+21	1.2870E+11	1.2500	0.0369	0.0000	0.0000
Kr-94	0.21000 s 1.90	1.3457E+21	1.2005E+11	0.0000	0.0000	0.0000	0.0000
La-147	4.0150 s 0.20	2.5658E+22	1.1972E+11	0.1836	2.0380	0.0000	0.0000
Kr-93	1.2860 s 0.78	8.1147E+21	1.1821E+11	2.1290	2.8730	0.0000	0.0000
Se-88	1.5300 s 3.92	9.4522E+21	1.1574E+11	1.0400	1.3300	0.0000	0.0000
Ba-147	0.89300 s 0.11	5.4412E+21	1.1415E+11	0.2887	2.3700	0.0000	0.0000
Br-91	0.53800 s 2.42	3.2314E+21	1.1252E+11	0.0000	0.0000	0.0000	0.0000
Ba-144	11.500 s 1.74	6.7583E+22	1.1009E+11	0.4690	0.8533	0.0000	0.0000
Se-89	0.41000 s 9.76	2.2676E+21	1.0361E+11	0.0000	0.0000	0.0000	0.0000
Ba-143	14.500 s 2.07	8.0098E+22	1.0348E+11	0.2310	1.7200	0.0000	0.0000
I-139	2.3000 s 1.30	1.2491E+22	1.0174E+11	0.4984	2.5300	0.0000	0.0000
Cs-145	0.59400 s 2.19	3.0084E+21	9.4880E+10	0.4866	2.8130	0.0000	0.0000
Nb-101	7.1000 s 4.23	3.3842E+22	8.9293E+10	0.2700	1.8320	0.0000	0.0000
I-138	6.4600 s 0.93	3.0368E+22	8.8066E+10	1.8900	2.5900	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 1102
Total activity (Ci) = 2.05302E+13

Total number of decays = 1.46674E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 0.90410
Average chain length = 3.5476

Average gamma E (MeV) = 0.96312
Average beta E (MeV) = 2.0797
Average alpha E (MeV) = 1.60746E-25

Composite Exposure Rate Conversion Factor = 17.2705078 R/hr per Ci/m2
Composite ECF per FGR table = 1.97814591E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0390415 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.224593058 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s 1.17	3.8019E+22	1.6602E+12	1.8600	2.6600	0.0000	0.0000
Sr-96	1.0600 s 2.83	8.7806E+22	1.5518E+12	0.9320	1.9900	0.0000	0.0000
Y-98	0.59000 s 5.09	2.9143E+22	9.2535E+11	0.9070	3.7400	0.0000	0.0000
Rb-95	0.38100 s 0.79	1.4590E+22	7.1736E+11	0.6120	2.3320	0.0000	0.0000
Y-99	1.4770 s 0.34	5.0309E+22	6.3810E+11	0.8180	3.1200	0.0000	0.0000
Zr-99	2.2000 s 4.55	7.4017E+22	6.3028E+11	0.8600	1.5500	0.0000	0.0000
Zr-101	2.3000 s 4.35	7.4782E+22	6.0911E+11	0.5564	2.2060	0.0000	0.0000
Sr-98	0.65300 s 0.31	2.0000E+22	5.7377E+11	0.1440	2.5600	0.0000	0.0000
Cs-142	1.7000 s 1.18	4.8355E+22	5.3286E+11	0.6754	2.8800	0.0000	0.0000
Y-97m	1.1700 s 2.56	3.2258E+22	5.1650E+11	1.8000	2.4100	0.0000	0.0000
Nb-103	1.5000 s 13.33	4.0725E+22	5.0863E+11	0.0000	0.0000	0.0000	0.0000
Y-100	0.73500 s 0.95	1.8919E+22	4.8221E+11	1.9610	3.6680	0.0000	0.0000
Zr-102	2.9000 s 6.90	5.0424E+22	3.2573E+11	0.2374	1.9850	0.0000	0.0000
Kr-92	1.8400 s 0.43	3.0650E+22	3.1206E+11	1.4050	1.9900	0.0000	0.0000
Rb-94	2.7020 s 0.26	4.2639E+22	2.9563E+11	2.7400	3.2400	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.0462E+22	2.9486E+11	0.0000	0.0000	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.0958E+23	2.8912E+11	0.2589	1.3410	0.0000	0.0000
Rb-96	0.19900 s 1.51	3.0383E+21	2.8603E+11	2.0300	4.0800	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.6774E+22	2.8005E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000 s 10.00	2.9400E+22	2.7539E+11	3.0400	2.6300	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.2458E+22	2.6048E+11	1.3995	2.9000	0.0000	0.0000
Y-101	0.45000 s 4.44	5.8267E+21	2.4257E+11	0.9522	3.5580	0.0000	0.0000
Rb-93	5.8000 s 0.69	7.4985E+22	2.4220E+11	1.4200	2.7100	0.0000	0.0000
Sr-99	0.27000 s 3.70	3.3729E+21	2.3403E+11	1.2720	3.2490	0.0000	0.0000
Y-97	3.7500 s 0.80	4.6598E+22	2.3279E+11	1.8300	2.1600	0.0000	0.0000
Xe-141	1.7300 s 0.58	2.0937E+22	2.2672E+11	0.6594	1.7940	0.0000	0.0000
Ba-145	4.3100 s 3.71	5.1199E+22	2.2254E+11	0.3100	2.0200	0.0000	0.0000
Zr-103	1.3000 s 7.69	1.5290E+22	2.2034E+11	0.0000	0.0000	0.0000	0.0000
Ba-146	2.2200 s 3.15	2.5253E+22	2.1310E+11	0.8094	1.1750	0.0000	0.0000
Xe-142	1.2200 s 1.64	1.2632E+22	1.9397E+11	0.0000	0.0000	0.0000	0.0000
Cs-144	0.99400 s 0.40	9.1232E+21	1.7194E+11	0.0000	0.0000	0.0000	0.0000
Nb-104m	0.94000 s 4.26	8.3526E+21	1.6646E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000 s 2.11	1.6329E+22	1.6100E+11	1.3710	2.9250	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.5149E+22	1.4241E+11	1.7310	2.0880	0.0000	0.0000
Sb-134	0.78000 s 7.69	5.8380E+21	1.4021E+11	0.0180	3.7900	0.0000	0.0000
Br-89	4.3700 s 1.14	3.0648E+22	1.3139E+11	1.5880	2.5100	0.0000	0.0000
La-148	1.4280 s 0.84	9.6459E+21	1.2654E+11	1.2500	0.0369	0.0000	0.0000
La-147	4.0150 s 0.20	2.5646E+22	1.1966E+11	0.1836	2.0380	0.0000	0.0000
Kr-93	1.2860 s 0.78	7.9561E+21	1.1590E+11	2.1290	2.8730	0.0000	0.0000
Se-88	1.5300 s 3.92	9.2670E+21	1.1347E+11	1.0400	1.3300	0.0000	0.0000
Ba-147	0.89300 s 0.11	5.2593E+21	1.1033E+11	0.2887	2.3700	0.0000	0.0000
Ba-144	11.500 s 1.74	6.7703E+22	1.1029E+11	0.4690	0.8533	0.0000	0.0000
Br-91	0.53800 s 2.42	3.0529E+21	1.0630E+11	0.0000	0.0000	0.0000	0.0000
Ba-143	14.500 s 2.07	8.0395E+22	1.0387E+11	0.2310	1.7200	0.0000	0.0000
Kr-94	0.21000 s 1.90	1.1611E+21	1.0358E+11	0.0000	0.0000	0.0000	0.0000
I-139	2.3000 s 1.30	1.2342E+22	1.0052E+11	0.4984	2.5300	0.0000	0.0000
Se-89	0.41000 s 9.76	2.1031E+21	9.6093E+10	0.0000	0.0000	0.0000	0.0000
Nb-101	7.1000 s 4.23	3.4705E+22	9.1570E+10	0.2700	1.8320	0.0000	0.0000
Nb-100	1.5000 s 13.33	7.2329E+21	9.0332E+10	0.7117	2.5460	0.0000	0.0000
Cs-145	0.59400 s 2.19	2.8580E+21	9.0136E+10	0.4866	2.8130	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.99200E+13

Total number of decays = 1.80163E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 1.1105
Average chain length = 3.5476

Average gamma E (MeV) = 0.96095
Average beta E (MeV) = 2.0717
Average alpha E (MeV) = 1.65671E-25

Composite Exposure Rate Conversion Factor = 17.2349377 R/hr per Ci/m2
Composite ECF per FGR table = 2.11085752E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.0118380 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.280494660 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-97	0.42900 s 1.17	3.4812E+22	1.5202E+12	1.8600	2.6600	0.0000	0.0000
Sr-96	1.0600 s 2.83	8.5140E+22	1.5047E+12	0.9320	1.9900	0.0000	0.0000
Y-98	0.59000 s 5.09	2.8406E+22	9.0194E+11	0.9070	3.7400	0.0000	0.0000
Rb-95	0.38100 s 0.79	1.3224E+22	6.5023E+11	0.6120	2.3320	0.0000	0.0000
Zr-99	2.2000 s 4.55	7.4009E+22	6.3021E+11	0.8600	1.5500	0.0000	0.0000
Y-99	1.4770 s 0.34	4.9452E+22	6.2723E+11	0.8180	3.1200	0.0000	0.0000
Zr-101	2.3000 s 4.35	7.4016E+22	6.0287E+11	0.5564	2.2060	0.0000	0.0000
Sr-98	0.65300 s 0.31	1.8862E+22	5.4114E+11	0.1440	2.5600	0.0000	0.0000
Cs-142	1.7000 s 1.18	4.7655E+22	5.2515E+11	0.6754	2.8800	0.0000	0.0000
Y-97m	1.1700 s 2.56	3.1688E+22	5.0738E+11	1.8000	2.4100	0.0000	0.0000
Nb-103	1.5000 s 13.33	4.0130E+22	5.0120E+11	0.0000	0.0000	0.0000	0.0000
Y-100	0.73500 s 0.95	1.8041E+22	4.5983E+11	1.9610	3.6680	0.0000	0.0000
Zr-102	2.9000 s 6.90	4.9876E+22	3.2219E+11	0.2374	1.9850	0.0000	0.0000
Kr-92	1.8400 s 0.43	3.0112E+22	3.0658E+11	1.4050	1.9900	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.0521E+22	2.9572E+11	0.0000	0.0000	0.0000	0.0000
Rb-94	2.7020 s 0.26	4.2225E+22	2.9276E+11	2.7400	3.2400	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.0994E+23	2.9009E+11	0.2589	1.3410	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.6254E+22	2.7462E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000 s 10.00	2.8836E+22	2.7010E+11	3.0400	2.6300	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.2558E+22	2.6090E+11	1.3995	2.9000	0.0000	0.0000
Y-97	3.7500 s 0.80	4.8908E+22	2.4433E+11	1.8300	2.1600	0.0000	0.0000
Rb-93	5.8000 s 0.69	7.4723E+22	2.4135E+11	1.4200	2.7100	0.0000	0.0000
Rb-96	0.19900 s 1.51	2.5053E+21	2.3584E+11	2.0300	4.0800	0.0000	0.0000
Y-101	0.45000 s 4.44	5.3548E+21	2.2292E+11	0.9522	3.5580	0.0000	0.0000
Xe-141	1.7300 s 0.58	2.0509E+22	2.2209E+11	0.6594	1.7940	0.0000	0.0000
Ba-145	4.3100 s 3.71	5.0899E+22	2.2124E+11	0.3100	2.0200	0.0000	0.0000
Zr-103	1.3000 s 7.69	1.4864E+22	2.1420E+11	0.0000	0.0000	0.0000	0.0000
Ba-146	2.2200 s 3.15	2.4847E+22	2.0968E+11	0.8094	1.1750	0.0000	0.0000
Sr-99	0.27000 s 3.70	2.9225E+21	2.0278E+11	1.2720	3.2490	0.0000	0.0000
Xe-142	1.2200 s 1.64	1.2244E+22	1.8801E+11	0.0000	0.0000	0.0000	0.0000
Cs-144	0.99400 s 0.40	8.7867E+21	1.6560E+11	0.0000	0.0000	0.0000	0.0000
Nb-104m	0.94000 s 4.26	8.0153E+21	1.5974E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000 s 2.11	1.6047E+22	1.5822E+11	1.3710	2.9250	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.5042E+22	1.4218E+11	1.7310	2.0880	0.0000	0.0000
Sb-134	0.78000 s 7.69	5.5710E+21	1.3380E+11	0.0180	3.7900	0.0000	0.0000
Br-89	4.3700 s 1.14	3.0552E+22	1.3097E+11	1.5880	2.5100	0.0000	0.0000
La-148	1.4280 s 0.84	9.4426E+21	1.2388E+11	1.2500	0.0369	0.0000	0.0000
La-147	4.0150 s 0.20	2.5622E+22	1.1955E+11	0.1836	2.0380	0.0000	0.0000
Kr-93	1.2860 s 0.78	7.7508E+21	1.1291E+11	2.1290	2.8730	0.0000	0.0000
Se-88	1.5300 s 3.92	9.0402E+21	1.1069E+11	1.0400	1.3300	0.0000	0.0000
Ba-144	11.500 s 1.74	6.7838E+22	1.1051E+11	0.4690	0.8533	0.0000	0.0000
Ba-147	0.89300 s 0.11	5.0401E+21	1.0573E+11	0.2887	2.3700	0.0000	0.0000
Ba-143	14.500 s 2.07	8.0755E+22	1.0433E+11	0.2310	1.7200	0.0000	0.0000
Br-91	0.53800 s 2.42	2.8436E+21	9.9015E+10	0.0000	0.0000	0.0000	0.0000
I-139	2.3000 s 1.30	1.2156E+22	9.9015E+10	0.4984	2.5300	0.0000	0.0000
Nb-100	1.5000 s 13.33	7.6398E+21	9.5415E+10	0.7117	2.5460	0.0000	0.0000
Nb-101	7.1000 s 4.23	3.5766E+22	9.4370E+10	0.2700	1.8320	0.0000	0.0000
I-138	6.4600 s 0.93	3.0170E+22	8.7493E+10	1.8900	2.5900	0.0000	0.0000
Se-89	0.41000 s 9.76	1.9142E+21	8.7462E+10	0.0000	0.0000	0.0000	0.0000
Kr-94	0.21000 s 1.90	9.6564E+20	8.6143E+10	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867389D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.92174E+13

Total number of decays = 2.20628E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 1.3599
Average chain length = 3.5476

Average gamma E (MeV) = 0.95803
Average beta E (MeV) = 2.0617
Average alpha E (MeV) = 1.71727E-25

Composite Exposure Rate Conversion Factor = 17.1862793 R/hr per Ci/m2
Composite ECF per FGR table = 2.28439420E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.9753933 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.350310326 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s	2.83	8.1825E+22	1.4461E+12	0.9320	1.9900	0.0000
Sr-97	0.42900 s	1.17	3.1172E+22	1.3612E+12	1.8600	2.6600	0.0000
Y-98	0.59000 s	5.09	2.7462E+22	8.7198E+11	0.9070	3.7400	0.0000
Zr-99	2.2000 s	4.55	7.3966E+22	6.2985E+11	0.8600	1.5500	0.0000
Y-99	1.4770 s	0.34	4.8331E+22	6.1301E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.3022E+22	5.9477E+11	0.5564	2.2060	0.0000
Rb-95	0.38100 s	0.79	1.1685E+22	5.7455E+11	0.6120	2.3320	0.0000
Cs-142	1.7000 s	1.18	4.6786E+22	5.1557E+11	0.6754	2.8800	0.0000
Sr-98	0.65300 s	0.31	1.7528E+22	5.0285E+11	0.1440	2.5600	0.0000
Y-97m	1.1700 s	2.56	3.0945E+22	4.9549E+11	1.8000	2.4100	0.0000
Nb-103	1.5000 s	13.33	3.9391E+22	4.9196E+11	0.0000	0.0000	0.0000
Y-100	0.73500 s	0.95	1.6985E+22	4.3291E+11	1.9610	3.6680	0.0000
Zr-102	2.9000 s	6.90	4.9182E+22	3.1771E+11	0.2374	1.9850	0.0000
Kr-92	1.8400 s	0.43	2.9423E+22	2.9957E+11	1.4050	1.9900	0.0000
Nb-102	1.3000 s	15.38	2.0582E+22	2.9660E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.1033E+23	2.9112E+11	0.2589	1.3410	0.0000
Rb-94	2.7020 s	0.26	4.1671E+22	2.8892E+11	2.7400	3.2400	0.0000
Cs-143	1.7910 s	0.39	2.5616E+22	2.6794E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	2.8147E+22	2.6365E+11	3.0400	2.6300	0.0000
Rb-92	4.4920 s	0.45	6.2667E+22	2.6135E+11	1.3995	2.9000	0.0000
Y-97	3.7500 s	0.80	5.1433E+22	2.5694E+11	1.8300	2.1600	0.0000
Rb-93	5.8000 s	0.69	7.4390E+22	2.4028E+11	1.4200	2.7100	0.0000
Ba-145	4.3100 s	3.71	5.0515E+22	2.1957E+11	0.3100	2.0200	0.0000
Xe-141	1.7300 s	0.58	1.9985E+22	2.1641E+11	0.6594	1.7940	0.0000
Zr-103	1.3000 s	7.69	1.4344E+22	2.0671E+11	0.0000	0.0000	0.0000
Ba-146	2.2200 s	3.15	2.4345E+22	2.0544E+11	0.8094	1.1750	0.0000
Y-101	0.45000 s	4.44	4.8163E+21	2.0051E+11	0.9522	3.5580	0.0000
Rb-96	0.19900 s	1.51	1.9685E+21	1.8531E+11	2.0300	4.0800	0.0000
Xe-142	1.2200 s	1.64	1.1774E+22	1.8080E+11	0.0000	0.0000	0.0000
Sr-99	0.27000 s	3.70	2.4432E+21	1.6952E+11	1.2720	3.2490	0.0000
Cs-144	0.99400 s	0.40	8.3827E+21	1.5799E+11	0.0000	0.0000	0.0000
Br-90	1.9000 s	2.11	1.5695E+22	1.5475E+11	1.3710	2.9250	0.0000
Nb-104m	0.94000 s	4.26	7.6131E+21	1.5172E+11	0.0000	0.0000	0.0000
Kr-91	8.5700 s	0.47	6.4891E+22	1.4185E+11	1.7310	2.0880	0.0000
Br-89	4.3700 s	1.14	3.0411E+22	1.3037E+11	1.5880	2.5100	0.0000
Sb-134	0.78000 s	7.69	5.2548E+21	1.2621E+11	0.0180	3.7900	0.0000
La-148	1.4280 s	0.84	9.1916E+21	1.2058E+11	1.2500	0.0369	0.0000
La-147	4.0150 s	0.20	2.5580E+22	1.1935E+11	0.1836	2.0380	0.0000
Ba-144	11.500 s	1.74	6.7987E+22	1.1075E+11	0.4690	0.8533	0.0000
Kr-93	1.2860 s	0.78	7.4896E+21	1.0910E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	8.7641E+21	1.0731E+11	1.0400	1.3300	0.0000
Ba-143	14.500 s	2.07	8.1187E+22	1.0489E+11	0.2310	1.7200	0.0000
Nb-100	1.5000 s	13.33	8.1360E+21	1.0161E+11	0.7117	2.5460	0.0000
Ba-147	0.89300 s	0.11	4.7784E+21	1.0024E+11	0.2887	2.3700	0.0000
Nb-101	7.1000 s	4.23	3.7065E+22	9.7797E+10	0.2700	1.8320	0.0000
I-139	2.3000 s	1.30	1.1927E+22	9.7147E+10	0.4984	2.5300	0.0000
Br-91	0.53800 s	2.42	2.6019E+21	9.0600E+10	0.0000	0.0000	0.0000
I-138	6.4600 s	0.93	3.0031E+22	8.7088E+10	1.8900	2.5900	0.0000
Xe-140	13.600 s	0.74	6.0730E+22	8.3654E+10	1.1500	1.2200	0.0000
Sr-95	23.900 s	0.59	1.0600E+23	8.3090E+10	1.0200	2.3000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.84193E+13

Total number of decays = 2.69222E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 1.6595
Average chain length = 3.5476

Average gamma E (MeV) = 0.95425
Average beta E (MeV) = 2.0493
Average alpha E (MeV) = 1.79168E-25

Composite Exposure Rate Conversion Factor = 17.1220322 R/hr per Ci/m2
Composite ECF per FGR table = 2.51361039E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.9280901 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.437503278 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s	2.83	7.7749E+22	1.3741E+12	0.9320	1.9900	0.0000
Sr-97	0.42900 s	1.17	2.7141E+22	1.1852E+12	1.8600	2.6600	0.0000
Y-98	0.59000 s	5.09	2.6260E+22	8.3382E+11	0.9070	3.7400	0.0000
Zr-99	2.2000 s	4.55	7.3863E+22	6.2897E+11	0.8600	1.5500	0.0000
Y-99	1.4770 s	0.34	4.6873E+22	5.9452E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.1733E+22	5.8427E+11	0.5564	2.2060	0.0000
Cs-142	1.7000 s	1.18	4.5710E+22	5.0371E+11	0.6754	2.8800	0.0000
Rb-95	0.38100 s	0.79	1.0000E+22	4.9170E+11	0.6120	2.3320	0.0000
Nb-103	1.5000 s	13.33	3.8475E+22	4.8052E+11	0.0000	0.0000	0.0000
Y-97m	1.1700 s	2.56	2.9981E+22	4.8005E+11	1.8000	2.4100	0.0000
Sr-98	0.65300 s	0.31	1.5988E+22	4.5867E+11	0.1440	2.5600	0.0000
Y-100	0.73500 s	0.95	1.5733E+22	4.0100E+11	1.9610	3.6680	0.0000
Zr-102	2.9000 s	6.90	4.8304E+22	3.1204E+11	0.2374	1.9850	0.0000
Nb-102	1.3000 s	15.38	2.0640E+22	2.9743E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.1073E+23	2.9216E+11	0.2589	1.3410	0.0000
Kr-92	1.8400 s	0.43	2.8554E+22	2.9072E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	4.0938E+22	2.8384E+11	2.7400	3.2400	0.0000
Y-97	3.7500 s	0.80	5.4082E+22	2.7017E+11	1.8300	2.1600	0.0000
Rb-92	4.4920 s	0.45	6.2775E+22	2.6180E+11	1.3995	2.9000	0.0000
Cs-143	1.7910 s	0.39	2.4834E+22	2.5977E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	2.7309E+22	2.5580E+11	3.0400	2.6300	0.0000
Rb-93	5.8000 s	0.69	7.3964E+22	2.3890E+11	1.4200	2.7100	0.0000
Ba-145	4.3100 s	3.71	5.0021E+22	2.1742E+11	0.3100	2.0200	0.0000
Xe-141	1.7300 s	0.58	1.9343E+22	2.0946E+11	0.6594	1.7940	0.0000
Ba-146	2.2200 s	3.15	2.3727E+22	2.0022E+11	0.8094	1.1750	0.0000
Zr-103	1.3000 s	7.69	1.3716E+22	1.9765E+11	0.0000	0.0000	0.0000
Y-101	0.45000 s	4.44	4.2169E+21	1.7555E+11	0.9522	3.5580	0.0000
Xe-142	1.2200 s	1.64	1.1212E+22	1.7216E+11	0.0000	0.0000	0.0000
Br-90	1.9000 s	2.11	1.5258E+22	1.5044E+11	1.3710	2.9250	0.0000
Cs-144	0.99400 s	0.40	7.9029E+21	1.4894E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	7.1390E+21	1.4228E+11	0.0000	0.0000	0.0000
Kr-91	8.5700 s	0.47	6.4677E+22	1.4138E+11	1.7310	2.0880	0.0000
Rb-96	0.19900 s	1.51	1.4562E+21	1.3709E+11	2.0300	4.0800	0.0000
Sr-99	0.27000 s	3.70	1.9533E+21	1.3553E+11	1.2720	3.2490	0.0000
Br-89	4.3700 s	1.14	3.0207E+22	1.2949E+11	1.5880	2.5100	0.0000
La-147	4.0150 s	0.20	2.5508E+22	1.1902E+11	0.1836	2.0380	0.0000
Sb-134	0.78000 s	7.69	4.8853E+21	1.1733E+11	0.0180	3.7900	0.0000
La-148	1.4280 s	0.84	8.8832E+21	1.1654E+11	1.2500	0.0369	0.0000
Ba-144	11.500 s	1.74	6.8142E+22	1.1101E+11	0.4690	0.8533	0.0000
Nb-100	1.5000 s	13.33	8.7370E+21	1.0912E+11	0.7117	2.5460	0.0000
Ba-143	14.500 s	2.07	8.1701E+22	1.0556E+11	0.2310	1.7200	0.0000
Kr-93	1.2860 s	0.78	7.1640E+21	1.0436E+11	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	8.4302E+21	1.0322E+11	1.0400	1.3300	0.0000
Nb-101	7.1000 s	4.23	3.8644E+22	1.0197E+11	0.2700	1.8320	0.0000
Y-96	5.3400 s	0.94	2.7290E+22	9.5737E+10	0.0010	0.1490	0.0000
I-139	2.3000 s	1.30	1.1644E+22	9.4844E+10	0.4984	2.5300	0.0000
Ba-147	0.89300 s	0.11	4.4698E+21	9.3770E+10	0.2887	2.3700	0.0000
I-138	6.4600 s	0.93	2.9854E+22	8.6575E+10	1.8900	2.5900	0.0000
Sr-95	23.900 s	0.59	1.0737E+23	8.4163E+10	1.0200	2.3000	0.0000
Xe-140	13.600 s	0.74	6.0643E+22	8.3534E+10	1.1500	1.2200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867392D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.75257E+13

Total number of decays = 3.27175E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 2.0167
Average chain length = 3.5476

Average gamma E (MeV) = 0.94951
Average beta E (MeV) = 2.0340
Average alpha E (MeV) = 1.88304E-25

Composite Exposure Rate Conversion Factor = 17.0403347 R/hr per Ci/m2
Composite ECF per FGR table = 2.81987041E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.8688202 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.546398699 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s	2.83	7.2810E+22	1.2868E+12	0.9320	1.9900	0.0000
Sr-97	0.42900 s	1.17	2.2815E+22	9.9631E+11	1.8600	2.6600	0.0000
Y-98	0.59000 s	5.09	2.4743E+22	7.8566E+11	0.9070	3.7400	0.0000
Zr-99	2.2000 s	4.55	7.3654E+22	6.2719E+11	0.8600	1.5500	0.0000
Y-99	1.4770 s	0.34	4.5003E+22	5.7080E+11	0.8180	3.1200	0.0000
Zr-101	2.3000 s	4.35	7.0064E+22	5.7068E+11	0.5564	2.2060	0.0000
Cs-142	1.7000 s	1.18	4.4381E+22	4.8907E+11	0.6754	2.8800	0.0000
Nb-103	1.5000 s	13.33	3.7342E+22	4.6637E+11	0.0000	0.0000	0.0000
Y-97m	1.1700 s	2.56	2.8739E+22	4.6016E+11	1.8000	2.4100	0.0000
Sr-98	0.65300 s	0.31	1.4249E+22	4.0879E+11	0.1440	2.5600	0.0000
Rb-95	0.38100 s	0.79	8.2226E+21	4.0430E+11	0.6120	2.3320	0.0000
Y-100	0.73500 s	0.95	1.4276E+22	3.6386E+11	1.9610	3.6680	0.0000
Zr-102	2.9000 s	6.90	4.7199E+22	3.0490E+11	0.2374	1.9850	0.0000
Nb-102	1.3000 s	15.38	2.0683E+22	2.9805E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.1107E+23	2.9307E+11	0.2589	1.3410	0.0000
Y-97	3.7500 s	0.80	5.6709E+22	2.8330E+11	1.8300	2.1600	0.0000
Kr-92	1.8400 s	0.43	2.7474E+22	2.7973E+11	1.4050	1.9900	0.0000
Rb-94	2.7020 s	0.26	3.9980E+22	2.7719E+11	2.7400	3.2400	0.0000
Rb-92	4.4920 s	0.45	6.2868E+22	2.6219E+11	1.3995	2.9000	0.0000
Cs-143	1.7910 s	0.39	2.3884E+22	2.4983E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	2.6297E+22	2.4632E+11	3.0400	2.6300	0.0000
Rb-93	5.8000 s	0.69	7.3416E+22	2.3713E+11	1.4200	2.7100	0.0000
Ba-145	4.3100 s	3.71	4.9385E+22	2.1466E+11	0.3100	2.0200	0.0000
Xe-141	1.7300 s	0.58	1.8564E+22	2.0103E+11	0.6594	1.7940	0.0000
Ba-146	2.2200 s	3.15	2.2969E+22	1.9383E+11	0.8094	1.1750	0.0000
Zr-103	1.3000 s	7.69	1.2963E+22	1.8680E+11	0.0000	0.0000	0.0000
Xe-142	1.2200 s	1.64	1.0545E+22	1.6192E+11	0.0000	0.0000	0.0000
Y-101	0.45000 s	4.44	3.5697E+21	1.4861E+11	0.9522	3.5580	0.0000
Br-90	1.9000 s	2.11	1.4717E+22	1.4510E+11	1.3710	2.9250	0.0000
Kr-91	8.5700 s	0.47	6.4375E+22	1.4072E+11	1.7310	2.0880	0.0000
Cs-144	0.99400 s	0.40	7.3403E+21	1.3834E+11	0.0000	0.0000	0.0000
Nb-104m	0.94000 s	4.26	6.5882E+21	1.3130E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	2.9915E+22	1.2824E+11	1.5880	2.5100	0.0000
La-147	4.0150 s	0.20	2.5392E+22	1.1848E+11	0.1836	2.0380	0.0000
Nb-100	1.5000 s	13.33	9.4582E+21	1.1812E+11	0.7117	2.5460	0.0000
Y-96	5.3400 s	0.94	3.2229E+22	1.1307E+11	0.0010	0.1490	0.0000
La-148	1.4280 s	0.84	8.5065E+21	1.1160E+11	1.2500	0.0369	0.0000
Ba-144	11.500 s	1.74	6.8293E+22	1.1125E+11	0.4690	0.8533	0.0000
Sb-134	0.78000 s	7.69	4.4605E+21	1.0713E+11	0.0180	3.7900	0.0000
Nb-101	7.1000 s	4.23	4.0550E+22	1.0699E+11	0.2700	1.8320	0.0000
Ba-143	14.500 s	2.07	8.2302E+22	1.0633E+11	0.2310	1.7200	0.0000
Sr-99	0.27000 s	3.70	1.4770E+21	1.0248E+11	1.2720	3.2490	0.0000
Kr-93	1.2860 s	0.78	6.7673E+21	9.8583E+10	2.1290	2.8730	0.0000
Se-88	1.5300 s	3.92	8.0299E+21	9.8320E+10	1.0400	1.3300	0.0000
Rb-96	0.19900 s	1.51	9.9920E+20	9.4064E+10	2.0300	4.0800	0.0000
I-139	2.3000 s	1.30	1.1297E+22	9.2017E+10	0.4984	2.5300	0.0000
Ba-147	0.89300 s	0.11	4.1113E+21	8.6248E+10	0.2887	2.3700	0.0000
I-138	6.4600 s	0.93	2.9629E+22	8.5923E+10	1.8900	2.5900	0.0000
Sr-95	23.900 s	0.59	1.0874E+23	8.5233E+10	1.0200	2.3000	0.0000
Xe-140	13.600 s	0.74	6.0517E+22	8.3361E+10	1.1500	1.2200	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867397D+24
Difference in atom count = -1.18E+10
Fractional difference = -2.58E-15

Total number of nuclides = 1102
Total activity (Ci) = 1.65406E+13

Total number of decays = 3.95760E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 2.4395
Average chain length = 3.5476

Average gamma E (MeV) = 0.94379
Average beta E (MeV) = 2.0157
Average alpha E (MeV) = 1.99519E-25

Composite Exposure Rate Conversion Factor = 16.9404335 R/hr per Ci/m2
Composite ECF per FGR table = 3.23426425E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.7974195 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.682398140 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s 2.83	6.6943E+22	1.1831E+12	0.9320	1.9900	0.0000	0.0000
Sr-97	0.42900 s 1.17	1.8354E+22	8.0149E+11	1.8600	2.6600	0.0000	0.0000
Y-98	0.59000 s 5.09	2.2857E+22	7.2575E+11	0.9070	3.7400	0.0000	0.0000
Zr-99	2.2000 s 4.55	7.3271E+22	6.2393E+11	0.8600	1.5500	0.0000	0.0000
Zr-101	2.3000 s 4.35	6.7918E+22	5.5320E+11	0.5564	2.2060	0.0000	0.0000
Y-99	1.4770 s 0.34	4.2642E+22	5.4085E+11	0.8180	3.1200	0.0000	0.0000
Cs-142	1.7000 s 1.18	4.2748E+22	4.7107E+11	0.6754	2.8800	0.0000	0.0000
Nb-103	1.5000 s 13.33	3.5946E+22	4.4894E+11	0.0000	0.0000	0.0000	0.0000
Y-97m	1.1700 s 2.56	2.7157E+22	4.3483E+11	1.8000	2.4100	0.0000	0.0000
Sr-98	0.65300 s 0.31	1.2338E+22	3.5395E+11	0.1440	2.5600	0.0000	0.0000
Y-100	0.73500 s 0.95	1.2621E+22	3.2168E+11	1.9610	3.6680	0.0000	0.0000
Rb-95	0.38100 s 0.79	6.4318E+21	3.1625E+11	0.6120	2.3320	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.0694E+22	2.9822E+11	0.0000	0.0000	0.0000	0.0000
Zr-102	2.9000 s 6.90	4.5816E+22	2.9597E+11	0.2374	1.9850	0.0000	0.0000
Y-97	3.7500 s 0.80	5.9101E+22	2.9525E+11	1.8300	2.1600	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.1130E+23	2.9368E+11	0.2589	1.3410	0.0000	0.0000
Rb-94	2.7020 s 0.26	3.8751E+22	2.6867E+11	2.7400	3.2400	0.0000	0.0000
Kr-92	1.8400 s 0.43	2.6158E+22	2.6632E+11	1.4050	1.9900	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.2922E+22	2.6241E+11	1.3995	2.9000	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.2738E+22	2.3784E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000 s 10.00	2.5087E+22	2.3498E+11	3.0400	2.6300	0.0000	0.0000
Rb-93	5.8000 s 0.69	7.2708E+22	2.3484E+11	1.4200	2.7100	0.0000	0.0000
Ba-145	4.3100 s 3.71	4.8568E+22	2.1110E+11	0.3100	2.0200	0.0000	0.0000
Xe-141	1.7300 s 0.58	1.7627E+22	1.9088E+11	0.6594	1.7940	0.0000	0.0000
Ba-146	2.2200 s 3.15	2.2048E+22	1.8605E+11	0.8094	1.1750	0.0000	0.0000
Zr-103	1.3000 s 7.69	1.2074E+22	1.7399E+11	0.0000	0.0000	0.0000	0.0000
Xe-142	1.2200 s 1.64	9.7651E+21	1.4995E+11	0.0000	0.0000	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.3951E+22	1.3979E+11	1.7310	2.0880	0.0000	0.0000
Br-90	1.9000 s 2.11	1.4054E+22	1.3857E+11	1.3710	2.9250	0.0000	0.0000
Y-96	5.3400 s 0.94	3.7823E+22	1.3269E+11	0.0010	0.1490	0.0000	0.0000
Nb-100	1.5000 s 13.33	1.0313E+22	1.2880E+11	0.7117	2.5460	0.0000	0.0000
Br-89	4.3700 s 1.14	2.9506E+22	1.2649E+11	1.5880	2.5100	0.0000	0.0000
Cs-144	0.99400 s 0.40	6.6913E+21	1.2611E+11	0.0000	0.0000	0.0000	0.0000
Y-101	0.45000 s 4.44	2.8975E+21	1.2062E+11	0.9522	3.5580	0.0000	0.0000
Nb-104m	0.94000 s 4.26	5.9595E+21	1.1877E+11	0.0000	0.0000	0.0000	0.0000
La-147	4.0150 s 0.20	2.5211E+22	1.1763E+11	0.1836	2.0380	0.0000	0.0000
Nb-101	7.1000 s 4.23	4.2824E+22	1.1299E+11	0.2700	1.8320	0.0000	0.0000
Ba-144	11.500 s 1.74	6.8417E+22	1.1145E+11	0.4690	0.8533	0.0000	0.0000
Ba-143	14.500 s 2.07	8.2993E+22	1.0722E+11	0.2310	1.7200	0.0000	0.0000
La-148	1.4280 s 0.84	8.0502E+21	1.0561E+11	1.2500	0.0369	0.0000	0.0000
Sb-134	0.78000 s 7.69	3.9820E+21	9.5638E+10	0.0180	3.7900	0.0000	0.0000
Se-88	1.5300 s 3.92	7.5552E+21	9.2508E+10	1.0400	1.3300	0.0000	0.0000
Kr-93	1.2860 s 0.78	6.2954E+21	9.1708E+10	2.1290	2.8730	0.0000	0.0000
I-139	2.3000 s 1.30	1.0874E+22	8.8569E+10	0.4984	2.5300	0.0000	0.0000
Sr-95	23.900 s 0.59	1.1001E+23	8.6227E+10	1.0200	2.3000	0.0000	0.0000
I-138	6.4600 s 0.93	2.9343E+22	8.5095E+10	1.8900	2.5900	0.0000	0.0000
Xe-140	13.600 s 0.74	6.0335E+22	8.3110E+10	1.1500	1.2200	0.0000	0.0000
Ba-147	0.89300 s 0.11	3.7026E+21	7.7674E+10	0.2887	2.3700	0.0000	0.0000
Nb-102m	4.3000 s 9.30	1.7755E+22	7.7355E+10	2.0920	2.2690	0.0000	0.0000
Sr-99	0.27000 s 3.70	1.0417E+21	7.2279E+10	1.2720	3.2490	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.54728E+13

Total number of decays = 4.76238E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 2.9355
Average chain length = 3.5476

Average gamma E (MeV) = 0.93719
Average beta E (MeV) = 1.9940
Average alpha E (MeV) = 2.13287E-25

Composite Exposure Rate Conversion Factor = 16.8231258 R/hr per Ci/m2
Composite ECF per FGR table = 3.80245000E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.7148323 Rem/hr per Ci/m2

Fission Product Source

Point in time = 0.852248371 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s 2.83	6.0144E+22	1.0629E+12	0.9320	1.9900	0.0000	0.0000
Y-98	0.59000 s 5.09	2.0562E+22	6.5289E+11	0.9070	3.7400	0.0000	0.0000
Zr-99	2.2000 s 4.55	7.2611E+22	6.1830E+11	0.8600	1.5500	0.0000	0.0000
Sr-97	0.42900 s 1.17	1.3975E+22	6.1026E+11	1.8600	2.6600	0.0000	0.0000
Zr-101	2.3000 s 4.35	6.5184E+22	5.3093E+11	0.5564	2.2060	0.0000	0.0000
Y-99	1.4770 s 0.34	3.9728E+22	5.0389E+11	0.8180	3.1200	0.0000	0.0000
Cs-142	1.7000 s 1.18	4.0753E+22	4.4909E+11	0.6754	2.8800	0.0000	0.0000
Nb-103	1.5000 s 13.33	3.4238E+22	4.2761E+11	0.0000	0.0000	0.0000	0.0000
Y-97m	1.1700 s 2.56	2.5180E+22	4.0317E+11	1.8000	2.4100	0.0000	0.0000
Y-97	3.7500 s 0.80	6.0983E+22	3.0465E+11	1.8300	2.1600	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.0647E+22	2.9753E+11	0.0000	0.0000	0.0000	0.0000
Sr-98	0.65300 s 0.31	1.0304E+22	2.9561E+11	0.1440	2.5600	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.1131E+23	2.9370E+11	0.2589	1.3410	0.0000	0.0000
Zr-102	2.9000 s 6.90	4.4105E+22	2.8491E+11	0.2374	1.9850	0.0000	0.0000
Y-100	0.73500 s 0.95	1.0799E+22	2.7525E+11	1.9610	3.6680	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.2896E+22	2.6230E+11	1.3995	2.9000	0.0000	0.0000
Rb-94	2.7020 s 0.26	3.7205E+22	2.5795E+11	2.7400	3.2400	0.0000	0.0000
Kr-92	1.8400 s 0.43	2.4581E+22	2.5027E+11	1.4050	1.9900	0.0000	0.0000
Rb-95	0.38100 s 0.79	4.7276E+21	2.3245E+11	0.6120	2.3320	0.0000	0.0000
Rb-93	5.8000 s 0.69	7.1794E+22	2.3189E+11	1.4200	2.7100	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.1371E+22	2.2354E+11	0.7010	2.7600	0.0000	0.0000
Y-98m	2.0000 s 10.00	2.3653E+22	2.2155E+11	3.0400	2.6300	0.0000	0.0000
Ba-145	4.3100 s 3.71	4.7520E+22	2.0655E+11	0.3100	2.0200	0.0000	0.0000
Xe-141	1.7300 s 0.58	1.6513E+22	1.7882E+11	0.6594	1.7940	0.0000	0.0000
Ba-146	2.2200 s 3.15	2.0939E+22	1.7670E+11	0.8094	1.1750	0.0000	0.0000
Zr-103	1.3000 s 7.69	1.1042E+22	1.5913E+11	0.0000	0.0000	0.0000	0.0000
Y-96	5.3400 s 0.94	4.3972E+22	1.5426E+11	0.0010	0.1490	0.0000	0.0000
Nb-100	1.5000 s 13.33	1.1310E+22	1.4125E+11	0.7117	2.5460	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.3364E+22	1.3851E+11	1.7310	2.0880	0.0000	0.0000
Xe-142	1.2200 s 1.64	8.8700E+21	1.3620E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000 s 2.11	1.3253E+22	1.3068E+11	1.3710	2.9250	0.0000	0.0000
Br-89	4.3700 s 1.14	2.8942E+22	1.2407E+11	1.5880	2.5100	0.0000	0.0000
Nb-101	7.1000 s 4.23	4.5499E+22	1.2005E+11	0.2700	1.8320	0.0000	0.0000
La-147	4.0150 s 0.20	2.4933E+22	1.1634E+11	0.1836	2.0380	0.0000	0.0000
Cs-144	0.99400 s 0.40	5.9582E+21	1.1229E+11	0.0000	0.0000	0.0000	0.0000
Ba-144	11.500 s 1.74	6.8484E+22	1.1156E+11	0.4690	0.8533	0.0000	0.0000
Ba-143	14.500 s 2.07	8.3765E+22	1.0822E+11	0.2310	1.7200	0.0000	0.0000
Nb-104m	0.94000 s 4.26	5.2580E+21	1.0479E+11	0.0000	0.0000	0.0000	0.0000
La-148	1.4280 s 0.84	7.5039E+21	9.8443E+10	1.2500	0.0369	0.0000	0.0000
Y-101	0.45000 s 4.44	2.2317E+21	9.2907E+10	0.9522	3.5580	0.0000	0.0000
Sr-95	23.900 s 0.59	1.1106E+23	8.7055E+10	1.0200	2.3000	0.0000	0.0000
Se-88	1.5300 s 3.92	7.0001E+21	8.5711E+10	1.0400	1.3300	0.0000	0.0000
I-139	2.3000 s 1.30	1.0362E+22	8.4397E+10	0.4984	2.5300	0.0000	0.0000
I-138	6.4600 s 0.93	2.8979E+22	8.4039E+10	1.8900	2.5900	0.0000	0.0000
Kr-93	1.2860 s 0.78	5.7475E+21	8.3726E+10	2.1290	2.8730	0.0000	0.0000
Sb-134	0.78000 s 7.69	3.4567E+21	8.3020E+10	0.0180	3.7900	0.0000	0.0000
Xe-140	13.600 s 0.74	6.0075E+22	8.2751E+10	1.1500	1.2200	0.0000	0.0000
Nb-102m	4.3000 s 9.30	1.7276E+22	7.5265E+10	2.0920	2.2690	0.0000	0.0000
Ba-147	0.89300 s 0.11	3.2477E+21	6.8131E+10	0.2887	2.3700	0.0000	0.0000
Cs-141	24.940 s 0.24	8.1523E+22	6.1236E+10	1.0100	1.8800	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.43358E+13

Total number of decays = 5.69804E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 3.5123
Average chain length = 3.5476

Average gamma E (MeV) = 0.92986
Average beta E (MeV) = 1.9686
Average alpha E (MeV) = 2.30203E-25

Composite Exposure Rate Conversion Factor = 16.6908875 R/hr per Ci/m2
Composite ECF per FGR table = 4.59176414E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.6233072 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.06437480 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s	2.83	5.2506E+22	9.2795E+11	0.9320	1.9900	0.0000
Zr-99	2.2000 s	4.55	7.1526E+22	6.0906E+11	0.8600	1.5500	0.0000
Y-98	0.59000 s	5.09	1.7857E+22	5.6699E+11	0.9070	3.7400	0.0000
Zr-101	2.3000 s	4.35	6.1754E+22	5.0299E+11	0.5564	2.2060	0.0000
Y-99	1.4770 s	0.34	3.6232E+22	4.5955E+11	0.8180	3.1200	0.0000
Sr-97	0.42900 s	1.17	9.9340E+21	4.3380E+11	1.8600	2.6600	0.0000
Cs-142	1.7000 s	1.18	3.8337E+22	4.2247E+11	0.6754	2.8800	0.0000
Nb-103	1.5000 s	13.33	3.2166E+22	4.0172E+11	0.0000	0.0000	0.0000
Y-97m	1.1700 s	2.56	2.2771E+22	3.6460E+11	1.8000	2.4100	0.0000
Y-97	3.7500 s	0.80	6.2041E+22	3.0993E+11	1.8300	2.1600	0.0000
Nb-102	1.3000 s	15.38	2.0502E+22	2.9544E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.1095E+23	2.9276E+11	0.2589	1.3410	0.0000
Zr-102	2.9000 s	6.90	4.2013E+22	2.7140E+11	0.2374	1.9850	0.0000
Rb-92	4.4920 s	0.45	6.2729E+22	2.6161E+11	1.3995	2.9000	0.0000
Rb-94	2.7020 s	0.26	3.5305E+22	2.4478E+11	2.7400	3.2400	0.0000
Sr-98	0.65300 s	0.31	8.2274E+21	2.3603E+11	0.1440	2.5600	0.0000
Kr-92	1.8400 s	0.43	2.2728E+22	2.3140E+11	1.4050	1.9900	0.0000
Rb-93	5.8000 s	0.69	7.0610E+22	2.2807E+11	1.4200	2.7100	0.0000
Y-100	0.73500 s	0.95	8.8706E+21	2.2610E+11	1.9610	3.6680	0.0000
Cs-143	1.7910 s	0.39	1.9763E+22	2.0672E+11	0.7010	2.7600	0.0000
Y-98m	2.0000 s	10.00	2.1976E+22	2.0585E+11	3.0400	2.6300	0.0000
Ba-145	4.3100 s	3.71	4.6185E+22	2.0075E+11	0.3100	2.0200	0.0000
Y-96	5.3400 s	0.94	5.0472E+22	1.7707E+11	0.0010	0.1490	0.0000
Ba-146	2.2200 s	3.15	1.9622E+22	1.6558E+11	0.8094	1.1750	0.0000
Xe-141	1.7300 s	0.58	1.5209E+22	1.6470E+11	0.6594	1.7940	0.0000
Rb-95	0.38100 s	0.79	3.2160E+21	1.5813E+11	0.6120	2.3320	0.0000
Nb-100	1.5000 s	13.33	1.2447E+22	1.5545E+11	0.7117	2.5460	0.0000
Zr-103	1.3000 s	7.69	9.8709E+21	1.4224E+11	0.0000	0.0000	0.0000
Kr-91	8.5700 s	0.47	6.2563E+22	1.3676E+11	1.7310	2.0880	0.0000
Nb-101	7.1000 s	4.23	4.8581E+22	1.2818E+11	0.2700	1.8320	0.0000
Br-90	1.9000 s	2.11	1.2301E+22	1.2129E+11	1.3710	2.9250	0.0000
Br-89	4.3700 s	1.14	2.8184E+22	1.2082E+11	1.5880	2.5100	0.0000
Xe-142	1.2200 s	1.64	7.8650E+21	1.2077E+11	0.0000	0.0000	0.0000
La-147	4.0150 s	0.20	2.4521E+22	1.1441E+11	0.1836	2.0380	0.0000
Ba-144	11.500 s	1.74	6.8446E+22	1.1150E+11	0.4690	0.8533	0.0000
Ba-143	14.500 s	2.07	8.4598E+22	1.0930E+11	0.2310	1.7200	0.0000
Cs-144	0.99400 s	0.40	5.1514E+21	9.7087E+10	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	6.8601E+21	8.9997E+10	1.2500	0.0369	0.0000
Nb-104m	0.94000 s	4.26	4.4966E+21	8.9615E+10	0.0000	0.0000	0.0000
Sr-95	23.900 s	0.59	1.1178E+23	8.7621E+10	1.0200	2.3000	0.0000
I-138	6.4600 s	0.93	2.8515E+22	8.2693E+10	1.8900	2.5900	0.0000
Xe-140	13.600 s	0.74	5.9705E+22	8.2242E+10	1.1500	1.2200	0.0000
I-139	2.3000 s	1.30	9.7491E+21	7.9408E+10	0.4984	2.5300	0.0000
Se-88	1.5300 s	3.92	6.3623E+21	7.7901E+10	1.0400	1.3300	0.0000
Kr-93	1.2860 s	0.78	5.1275E+21	7.4695E+10	2.1290	2.8730	0.0000
Nb-102m	4.3000 s	9.30	1.6695E+22	7.2735E+10	2.0920	2.2690	0.0000
Sb-134	0.78000 s	7.69	2.8979E+21	6.9600E+10	0.0180	3.7900	0.0000
Y-101	0.45000 s	4.44	1.6101E+21	6.7031E+10	0.9522	3.5580	0.0000
Cs-141	24.940 s	0.24	8.2390E+22	6.1888E+10	1.0100	1.8800	0.0000
La-146	6.2700 s	1.59	2.0637E+22	6.1659E+10	1.4900	2.1600	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.31475E+13

Total number of decays = 6.77512E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 4.1762
Average chain length = 3.5476

Average gamma E (MeV) = 0.92209
Average beta E (MeV) = 1.9395
Average alpha E (MeV) = 2.51011E-25

Composite Exposure Rate Conversion Factor = 16.5475693 R/hr per Ci/m2
Composite ECF per FGR table = 5.70140406E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.5260992 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.32929909 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s	2.83	4.4236E+22	7.8180E+11	0.9320	1.9900	0.0000
Zr-99	2.2000 s	4.55	6.9819E+22	5.9453E+11	0.8600	1.5500	0.0000
Y-98	0.59000 s	5.09	1.4801E+22	4.6997E+11	0.9070	3.7400	0.0000
Zr-101	2.3000 s	4.35	5.7536E+22	4.6863E+11	0.5564	2.2060	0.0000
Y-99	1.4770 s	0.34	3.2176E+22	4.0811E+11	0.8180	3.1200	0.0000
Cs-142	1.7000 s	1.18	3.5449E+22	3.9065E+11	0.6754	2.8800	0.0000
Nb-103	1.5000 s	13.33	2.9682E+22	3.7070E+11	0.0000	0.0000	0.0000
Y-97m	1.1700 s	2.56	1.9937E+22	3.1923E+11	1.8000	2.4100	0.0000
Y-97	3.7500 s	0.80	6.1967E+22	3.0957E+11	1.8300	2.1600	0.0000
Nb-102	1.3000 s	15.38	2.0206E+22	2.9117E+11	0.0000	0.0000	0.0000
Zr-100	7.1000 s	5.63	1.1004E+23	2.9035E+11	0.2589	1.3410	0.0000
Sr-97	0.42900 s	1.17	6.4813E+21	2.8303E+11	1.8600	2.6600	0.0000
Rb-92	4.4920 s	0.45	6.2332E+22	2.5995E+11	1.3995	2.9000	0.0000
Zr-102	2.9000 s	6.90	3.9499E+22	2.5516E+11	0.2374	1.9850	0.0000
Rb-94	2.7020 s	0.26	3.3026E+22	2.2898E+11	2.7400	3.2400	0.0000
Rb-93	5.8000 s	0.69	6.9082E+22	2.2313E+11	1.4200	2.7100	0.0000
Kr-92	1.8400 s	0.43	2.0594E+22	2.0968E+11	1.4050	1.9900	0.0000
Y-96	5.3400 s	0.94	5.6981E+22	1.9990E+11	0.0010	0.1490	0.0000
Ba-145	4.3100 s	3.71	4.4503E+22	1.9343E+11	0.3100	2.0200	0.0000
Y-98m	2.0000 s	10.00	2.0048E+22	1.8779E+11	3.0400	2.6300	0.0000
Cs-143	1.7910 s	0.39	1.7905E+22	1.8728E+11	0.7010	2.7600	0.0000
Sr-98	0.65300 s	0.31	6.2108E+21	1.7818E+11	0.1440	2.5600	0.0000
Y-100	0.73500 s	0.95	6.9256E+21	1.7652E+11	1.9610	3.6680	0.0000
Nb-100	1.5000 s	13.33	1.3703E+22	1.7114E+11	0.7117	2.5460	0.0000
Ba-146	2.2200 s	3.15	1.8083E+22	1.5259E+11	0.8094	1.1750	0.0000
Xe-141	1.7300 s	0.58	1.3712E+22	1.4849E+11	0.6594	1.7940	0.0000
Nb-101	7.1000 s	4.23	5.2040E+22	1.3731E+11	0.2700	1.8320	0.0000
Kr-91	8.5700 s	0.47	6.1488E+22	1.3441E+11	1.7310	2.0880	0.0000
Zr-103	1.3000 s	7.69	8.5761E+21	1.2359E+11	0.0000	0.0000	0.0000
Br-89	4.3700 s	1.14	2.7190E+22	1.1656E+11	1.5880	2.5100	0.0000
La-147	4.0150 s	0.20	2.3926E+22	1.1164E+11	0.1836	2.0380	0.0000
Ba-144	11.500 s	1.74	6.8238E+22	1.1116E+11	0.4690	0.8533	0.0000
Ba-143	14.500 s	2.07	8.5447E+22	1.1040E+11	0.2310	1.7200	0.0000
Br-90	1.9000 s	2.11	1.1193E+22	1.1036E+11	1.3710	2.9250	0.0000
Xe-142	1.2200 s	1.64	6.7671E+21	1.0391E+11	0.0000	0.0000	0.0000
Rb-95	0.38100 s	0.79	1.9867E+21	9.7686E+10	0.6120	2.3320	0.0000
Sr-95	23.900 s	0.59	1.1206E+23	8.7838E+10	1.0200	2.3000	0.0000
Xe-140	13.600 s	0.74	5.9187E+22	8.1528E+10	1.1500	1.2200	0.0000
I-138	6.4600 s	0.93	2.7924E+22	8.0979E+10	1.8900	2.5900	0.0000
Cs-144	0.99400 s	0.40	4.2925E+21	8.0899E+10	0.0000	0.0000	0.0000
La-148	1.4280 s	0.84	6.1174E+21	8.0254E+10	1.2500	0.0369	0.0000
Nb-104m	0.94000 s	4.26	3.6987E+21	7.3712E+10	0.0000	0.0000	0.0000
I-139	2.3000 s	1.30	9.0270E+21	7.3525E+10	0.4984	2.5300	0.0000
Nb-102m	4.3000 s	9.30	1.5997E+22	6.9695E+10	2.0920	2.2690	0.0000
Se-88	1.5300 s	3.92	5.6453E+21	6.9122E+10	1.0400	1.3300	0.0000
Kr-93	1.2860 s	0.78	4.4455E+21	6.4759E+10	2.1290	2.8730	0.0000
La-146	6.2700 s	1.59	2.1577E+22	6.4468E+10	1.4900	2.1600	0.0000
Cs-141	24.940 s	0.24	8.3317E+22	6.2584E+10	1.0100	1.8800	0.0000
Ce-149	5.3000 s	3.77	1.6483E+22	5.8261E+10	0.0000	0.0000	0.0000
Te-135	19.000 s	1.05	5.8446E+22	5.7627E+10	0.3843	2.4090	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1102
Total activity (Ci) = 1.19288E+13

Total number of decays = 8.00208E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 4.9325
Average chain length = 3.5476

Average gamma E (MeV) = 0.91417
Average beta E (MeV) = 1.9066
Average alpha E (MeV) = 2.76654E-25

Composite Exposure Rate Conversion Factor = 16.3979092 R/hr per Ci/m2
Composite ECF per FGR table = 7.27628097E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.4271297 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.66016436 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Sr-96	1.0600 s 2.83	3.5666E+22	6.3033E+11	0.9320	1.9900	0.0000	0.0000
Zr-99	2.2000 s 4.55	6.7246E+22	5.7262E+11	0.8600	1.5500	0.0000	0.0000
Zr-101	2.3000 s 4.35	5.2483E+22	4.2747E+11	0.5564	2.2060	0.0000	0.0000
Y-98	0.59000 s 5.09	1.1541E+22	3.6645E+11	0.9070	3.7400	0.0000	0.0000
Cs-142	1.7000 s 1.18	3.2055E+22	3.5324E+11	0.6754	2.8800	0.0000	0.0000
Y-99	1.4770 s 0.34	2.7652E+22	3.5073E+11	0.8180	3.1200	0.0000	0.0000
Nb-103	1.5000 s 13.33	2.6757E+22	3.3418E+11	0.0000	0.0000	0.0000	0.0000
Y-97	3.7500 s 0.80	6.0525E+22	3.0236E+11	1.8300	2.1600	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.0835E+23	2.8589E+11	0.2589	1.3410	0.0000	0.0000
Nb-102	1.3000 s 15.38	1.9690E+22	2.8374E+11	0.0000	0.0000	0.0000	0.0000
Y-97m	1.1700 s 2.56	1.6748E+22	2.6816E+11	1.8000	2.4100	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.1582E+22	2.5683E+11	1.3995	2.9000	0.0000	0.0000
Zr-102	2.9000 s 6.90	3.6536E+22	2.3602E+11	0.2374	1.9850	0.0000	0.0000
Y-96	5.3400 s 0.94	6.3009E+22	2.2105E+11	0.0010	0.1490	0.0000	0.0000
Rb-93	5.8000 s 0.69	6.7115E+22	2.1678E+11	1.4200	2.7100	0.0000	0.0000
Rb-94	2.7020 s 0.26	3.0357E+22	2.1048E+11	2.7400	3.2400	0.0000	0.0000
Nb-100	1.5000 s 13.33	1.5032E+22	1.8774E+11	0.7117	2.5460	0.0000	0.0000
Kr-92	1.8400 s 0.43	1.8198E+22	1.8528E+11	1.4050	1.9900	0.0000	0.0000
Ba-145	4.3100 s 3.71	4.2410E+22	1.8434E+11	0.3100	2.0200	0.0000	0.0000
Y-98m	2.0000 s 10.00	1.7876E+22	1.6744E+11	3.0400	2.6300	0.0000	0.0000
Sr-97	0.42900 s 1.17	3.7997E+21	1.6593E+11	1.8600	2.6600	0.0000	0.0000
Cs-143	1.7910 s 0.39	1.5809E+22	1.6536E+11	0.7010	2.7600	0.0000	0.0000
Nb-101	7.1000 s 4.23	5.5780E+22	1.4718E+11	0.2700	1.8320	0.0000	0.0000
Ba-146	2.2200 s 3.15	1.6320E+22	1.3772E+11	0.8094	1.1750	0.0000	0.0000
Kr-91	8.5700 s 0.47	6.0077E+22	1.3133E+11	1.7310	2.0880	0.0000	0.0000
Xe-141	1.7300 s 0.58	1.2036E+22	1.3034E+11	0.6594	1.7940	0.0000	0.0000
Y-100	0.73500 s 0.95	5.0763E+21	1.2938E+11	1.9610	3.6680	0.0000	0.0000
Sr-98	0.65300 s 0.31	4.3714E+21	1.2541E+11	0.1440	2.5600	0.0000	0.0000
Ba-143	14.500 s 2.07	8.6237E+22	1.1142E+11	0.2310	1.7200	0.0000	0.0000
Br-89	4.3700 s 1.14	2.5925E+22	1.1114E+11	1.5880	2.5100	0.0000	0.0000
Ba-144	11.500 s 1.74	6.7775E+22	1.1041E+11	0.4690	0.8533	0.0000	0.0000
La-147	4.0150 s 0.20	2.3091E+22	1.0774E+11	0.1836	2.0380	0.0000	0.0000
Zr-103	1.3000 s 7.69	7.1919E+21	1.0364E+11	0.0000	0.0000	0.0000	0.0000
Br-90	1.9000 s 2.11	9.9358E+21	9.7966E+10	1.3710	2.9250	0.0000	0.0000
Sr-95	23.900 s 0.59	1.1181E+23	8.7645E+10	1.0200	2.3000	0.0000	0.0000
Xe-142	1.2200 s 1.64	5.6079E+21	8.6113E+10	0.0000	0.0000	0.0000	0.0000
Xe-140	13.600 s 0.74	5.8473E+22	8.0545E+10	1.1500	1.2200	0.0000	0.0000
I-138	6.4600 s 0.93	2.7174E+22	7.8804E+10	1.8900	2.5900	0.0000	0.0000
La-148	1.4280 s 0.84	5.2845E+21	6.9327E+10	1.2500	0.0369	0.0000	0.0000
La-146	6.2700 s 1.59	2.2545E+22	6.7360E+10	1.4900	2.1600	0.0000	0.0000
I-139	2.3000 s 1.30	8.1915E+21	6.6721E+10	0.4984	2.5300	0.0000	0.0000
Nb-102m	4.3000 s 9.30	1.5166E+22	6.6075E+10	2.0920	2.2690	0.0000	0.0000
Cs-144	0.99400 s 0.40	3.4152E+21	6.4366E+10	0.0000	0.0000	0.0000	0.0000
Cs-141	24.940 s 0.24	8.4255E+22	6.3288E+10	1.0100	1.8800	0.0000	0.0000
Se-88	1.5300 s 3.92	4.8610E+21	5.9520E+10	1.0400	1.3300	0.0000	0.0000
Zr-98	30.700 s 1.30	9.6878E+22	5.9117E+10	0.0019	0.9070	0.0000	0.0000
Nb-104m	0.94000 s 4.26	2.8979E+21	5.7754E+10	0.0000	0.0000	0.0000	0.0000
Te-135	19.000 s 1.05	5.8170E+22	5.7355E+10	0.3843	2.4090	0.0000	0.0000
Ce-149	5.3000 s 3.77	1.6083E+22	5.6849E+10	0.0000	0.0000	0.0000	0.0000
Kr-93	1.2860 s 0.78	3.7194E+21	5.4182E+10	2.1290	2.8730	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867395D+24
Difference in atom count = -1.02E+10
Fractional difference = -2.23E-15

Total number of nuclides = 1102
Total activity (Ci) = 1.07028E+13

Total number of decays = 9.38454E+23
Asympt number of decays = 1.62233E+25
Percent of decays = 5.7846
Average chain length = 3.5476

Average gamma E (MeV) = 0.90644
Average beta E (MeV) = 1.8704
Average alpha E (MeV) = 3.08345E-25

Composite Exposure Rate Conversion Factor = 16.2470627 R/hr per Ci/m2
Composite ECF per FGR table = 9.52462479E-02 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.3304749 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.07338262 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Zr-99	2.2000 s 4.55	6.3540E+22	5.4106E+11	0.8600	1.5500	0.0000	0.0000
Sr-96	1.0600 s 2.83	2.7233E+22	4.8130E+11	0.9320	1.9900	0.0000	0.0000
Zr-101	2.3000 s 4.35	4.6621E+22	3.7974E+11	0.5564	2.2060	0.0000	0.0000
Cs-142	1.7000 s 1.18	2.8158E+22	3.1029E+11	0.6754	2.8800	0.0000	0.0000
Nb-103	1.5000 s 13.33	2.3397E+22	2.9220E+11	0.0000	0.0000	0.0000	0.0000
Y-99	1.4770 s 0.34	2.2827E+22	2.8953E+11	0.8180	3.1200	0.0000	0.0000
Y-97	3.7500 s 0.80	5.7609E+22	2.8779E+11	1.8300	2.1600	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.0566E+23	2.7878E+11	0.2589	1.3410	0.0000	0.0000
Nb-102	1.3000 s 15.38	1.8876E+22	2.7201E+11	0.0000	0.0000	0.0000	0.0000
Y-98	0.59000 s 5.09	8.3107E+21	2.6388E+11	0.9070	3.7400	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.0318E+22	2.5156E+11	1.3995	2.9000	0.0000	0.0000
Y-96	5.3400 s 0.94	6.7933E+22	2.3832E+11	0.0010	0.1490	0.0000	0.0000
Zr-102	2.9000 s 6.90	3.3121E+22	2.1396E+11	0.2374	1.9850	0.0000	0.0000
Y-97m	1.1700 s 2.56	1.3352E+22	2.1379E+11	1.8000	2.4100	0.0000	0.0000
Rb-93	5.8000 s 0.69	6.4605E+22	2.0867E+11	1.4200	2.7100	0.0000	0.0000
Nb-100	1.5000 s 13.33	1.6349E+22	2.0418E+11	0.7117	2.5460	0.0000	0.0000
Rb-94	2.7020 s 0.26	2.7311E+22	1.8936E+11	2.7400	3.2400	0.0000	0.0000
Ba-145	4.3100 s 3.71	3.9855E+22	1.7323E+11	0.3100	2.0200	0.0000	0.0000
Kr-92	1.8400 s 0.43	1.5584E+22	1.5867E+11	1.4050	1.9900	0.0000	0.0000
Nb-101	7.1000 s 4.23	5.9615E+22	1.5730E+11	0.2700	1.8320	0.0000	0.0000
Y-98m	2.0000 s 10.00	1.5491E+22	1.4510E+11	3.0400	2.6300	0.0000	0.0000
Cs-143	1.7910 s 0.39	1.3514E+22	1.4136E+11	0.7010	2.7600	0.0000	0.0000
Kr-91	8.5700 s 0.47	5.8265E+22	1.2737E+11	1.7310	2.0880	0.0000	0.0000
Ba-146	2.2200 s 3.15	1.4351E+22	1.2110E+11	0.8094	1.1750	0.0000	0.0000
Ba-143	14.500 s 2.07	8.6856E+22	1.1222E+11	0.2310	1.7200	0.0000	0.0000
Xe-141	1.7300 s 0.58	1.0218E+22	1.1064E+11	0.6594	1.7940	0.0000	0.0000
Ba-144	11.500 s 1.74	6.6955E+22	1.0907E+11	0.4690	0.8533	0.0000	0.0000
Br-89	4.3700 s 1.14	2.4364E+22	1.0445E+11	1.5880	2.5100	0.0000	0.0000
La-147	4.0150 s 0.20	2.1961E+22	1.0247E+11	0.1836	2.0380	0.0000	0.0000
Y-100	0.73500 s 0.95	3.4404E+21	8.7689E+10	1.9610	3.6680	0.0000	0.0000
Sr-95	23.900 s 0.59	1.1101E+23	8.7012E+10	1.0200	2.3000	0.0000	0.0000
Sr-97	0.42900 s 1.17	1.9495E+21	8.5133E+10	1.8600	2.6600	0.0000	0.0000
Br-90	1.9000 s 2.11	8.5536E+21	8.4337E+10	1.3710	2.9250	0.0000	0.0000
Zr-103	1.3000 s 7.69	5.7708E+21	8.3161E+10	0.0000	0.0000	0.0000	0.0000
Sr-98	0.65300 s 0.31	2.8193E+21	8.0881E+10	0.1440	2.5600	0.0000	0.0000
Xe-140	13.600 s 0.74	5.7508E+22	7.9216E+10	1.1500	1.2200	0.0000	0.0000
I-138	6.4600 s 0.93	2.6227E+22	7.6057E+10	1.8900	2.5900	0.0000	0.0000
La-146	6.2700 s 1.59	2.3469E+22	7.0120E+10	1.4900	2.1600	0.0000	0.0000
Xe-142	1.2200 s 1.64	4.4347E+21	6.8096E+10	0.0000	0.0000	0.0000	0.0000
Cs-141	24.940 s 0.24	8.5123E+22	6.3941E+10	1.0100	1.8800	0.0000	0.0000
Zr-98	30.700 s 1.30	1.0310E+23	6.2913E+10	0.0019	0.9070	0.0000	0.0000
Nb-102m	4.3000 s 9.30	1.4189E+22	6.1817E+10	2.0920	2.2690	0.0000	0.0000
I-139	2.3000 s 1.30	7.2481E+21	5.9036E+10	0.4984	2.5300	0.0000	0.0000
La-148	1.4280 s 0.84	4.3842E+21	5.7515E+10	1.2500	0.0369	0.0000	0.0000
Te-135	19.000 s 1.05	5.7756E+22	5.6946E+10	0.3843	2.4090	0.0000	0.0000
Ce-149	5.3000 s 3.77	1.5528E+22	5.4885E+10	0.0000	0.0000	0.0000	0.0000
Kr-90	32.320 s 0.28	9.1728E+22	5.3168E+10	1.3230	1.3600	0.0000	0.0000
Y-96m	9.6200 s 1.56	2.6469E+22	5.1545E+10	3.9700	0.0049	0.0000	0.0000
Se-88	1.5300 s 3.92	4.0320E+21	4.9368E+10	1.0400	1.3300	0.0000	0.0000
Cs-144	0.99400 s 0.40	2.5647E+21	4.8337E+10	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 1102
Total activity (Ci) = 9.49222E+12

Total number of decays = 1.09246E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 6.7339
Average chain length = 3.5476

Average gamma E (MeV) = 0.89920
Average beta E (MeV) = 1.8319
Average alpha E (MeV) = 3.47670E-25

Composite Exposure Rate Conversion Factor = 16.1002560 R/hr per Ci/m2
Composite ECF per FGR table = 0.127377510 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.2400074 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.58945155 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Zr-99	2.2000	s	4.55	5.8459E+22	4.9779E+11	0.8600	1.5500	0.0000
Sr-96	1.0600	s	2.83	1.9436E+22	3.4350E+11	0.9320	1.9900	0.0000
Zr-101	2.3000	s	4.35	4.0078E+22	3.2644E+11	0.5564	2.2060	0.0000
Zr-100	7.1000	s	5.63	1.0175E+23	2.6846E+11	0.2589	1.3410	0.0000
Y-97	3.7500	s	0.80	5.3280E+22	2.6617E+11	1.8300	2.1600	0.0000
Cs-142	1.7000	s	1.18	2.3822E+22	2.6252E+11	0.6754	2.8800	0.0000
Nb-102	1.3000	s	15.38	1.7686E+22	2.5487E+11	0.0000	0.0000	0.0000
Y-96	5.3400	s	0.94	7.1063E+22	2.4930E+11	0.0010	0.1490	0.0000
Nb-103	1.5000	s	13.33	1.9661E+22	2.4555E+11	0.0000	0.0000	0.0000
Rb-92	4.4920	s	0.45	5.8345E+22	2.4333E+11	1.3995	2.9000	0.0000
Y-99	1.4770	s	0.34	1.7936E+22	2.2749E+11	0.8180	3.1200	0.0000
Nb-100	1.5000	s	13.33	1.7526E+22	2.1889E+11	0.7117	2.5460	0.0000
Rb-93	5.8000	s	0.69	6.1441E+22	1.9845E+11	1.4200	2.7100	0.0000
Zr-102	2.9000	s	6.90	2.9287E+22	1.8919E+11	0.2374	1.9850	0.0000
Y-98	0.59000	s	5.09	5.3998E+21	1.7145E+11	0.9070	3.7400	0.0000
Nb-101	7.1000	s	4.23	6.3246E+22	1.6688E+11	0.2700	1.8320	0.0000
Rb-94	2.7020	s	0.26	2.3927E+22	1.6589E+11	2.7400	3.2400	0.0000
Ba-145	4.3100	s	3.71	3.6805E+22	1.5998E+11	0.3100	2.0200	0.0000
Y-97m	1.1700	s	2.56	9.9731E+21	1.5969E+11	1.8000	2.4100	0.0000
Kr-92	1.8400	s	0.43	1.2836E+22	1.3069E+11	1.4050	1.9900	0.0000
Kr-91	8.5700	s	0.47	5.5994E+22	1.2240E+11	1.7310	2.0880	0.0000
Y-98m	2.0000	s	10.00	1.2954E+22	1.2134E+11	3.0400	2.6300	0.0000
Cs-143	1.7910	s	0.39	1.1095E+22	1.1605E+11	0.7010	2.7600	0.0000
Ba-143	14.500	s	2.07	8.7144E+22	1.1259E+11	0.2310	1.7200	0.0000
Ba-144	11.500	s	1.74	6.5664E+22	1.0697E+11	0.4690	0.8533	0.0000
Ba-146	2.2200	s	3.15	1.2218E+22	1.0311E+11	0.8094	1.1750	0.0000
Br-89	4.3700	s	1.14	2.2496E+22	9.6440E+10	1.5880	2.5100	0.0000
La-147	4.0150	s	0.20	2.0486E+22	9.5587E+10	0.1836	2.0380	0.0000
Xe-141	1.7300	s	0.58	8.3194E+21	9.0089E+10	0.6594	1.7940	0.0000
Sr-95	23.900	s	0.59	1.0964E+23	8.5941E+10	1.0200	2.3000	0.0000
Xe-140	13.600	s	0.74	5.6231E+22	7.7457E+10	1.1500	1.2200	0.0000
I-138	6.4600	s	0.93	2.5043E+22	7.2624E+10	1.8900	2.5900	0.0000
La-146	6.2700	s	1.59	2.4242E+22	7.2430E+10	1.4900	2.1600	0.0000
Br-90	1.9000	s	2.11	7.0892E+21	6.9898E+10	1.3710	2.9250	0.0000
Zr-98	30.700	s	1.30	1.0849E+23	6.6201E+10	0.0019	0.9070	0.0000
Cs-141	24.940	s	0.24	8.5810E+22	6.4456E+10	1.0100	1.8800	0.0000
Zr-103	1.3000	s	7.69	4.3830E+21	6.3161E+10	0.0000	0.0000	0.0000
Nb-102m	4.3000	s	9.30	1.3056E+22	5.6883E+10	2.0920	2.2690	0.0000
Te-135	19.000	s	1.05	5.7150E+22	5.6349E+10	0.3843	2.4090	0.0000
Y-100	0.73500	s	0.95	2.1153E+21	5.3914E+10	1.9610	3.6680	0.0000
Kr-90	32.320	s	0.28	9.1847E+22	5.3237E+10	1.3230	1.3600	0.0000
Ce-149	5.3000	s	3.77	1.4780E+22	5.2243E+10	0.0000	0.0000	0.0000
Xe-142	1.2200	s	1.64	3.3077E+21	5.0792E+10	0.0000	0.0000	0.0000
I-139	2.3000	s	1.30	6.2143E+21	5.0616E+10	0.4984	2.5300	0.0000
Y-96m	9.6200	s	1.56	2.5503E+22	4.9664E+10	3.9700	0.0049	0.0000
Sr-98	0.65300	s	0.31	1.6302E+21	4.6767E+10	0.1440	2.5600	0.0000
La-148	1.4280	s	0.84	3.4560E+21	4.5339E+10	1.2500	0.0369	0.0000
Br-88	16.500	s	0.61	3.9923E+22	4.5327E+10	0.2244	0.0000	0.0000
I-137	24.510	s	0.24	5.5188E+22	4.2182E+10	1.1400	1.9600	0.0000
Nb-99	15.000	s	1.33	3.3622E+22	4.1991E+10	0.1680	1.4530	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 1102
Total activity (Ci) = 8.31864E+12

Total number of decays = 1.26201E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 7.7790
Average chain length = 3.5476

Average gamma E (MeV) = 0.89272
Average beta E (MeV) = 1.7927
Average alpha E (MeV) = 3.96718E-25

Composite Exposure Rate Conversion Factor = 15.9624958 R/hr per Ci/m2
Composite ECF per FGR table = 0.173079208 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.1590300 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.23397112 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Zr-99	2.2000 s	4.55	5.1868E+22	4.4167E+11	0.8600	1.5500	0.0000
Zr-101	2.3000 s	4.35	3.3089E+22	2.6951E+11	0.5564	2.2060	0.0000
Zr-100	7.1000 s	5.63	9.6463E+22	2.5452E+11	0.2589	1.3410	0.0000
Y-96	5.3400 s	0.94	7.1754E+22	2.5172E+11	0.0010	0.1490	0.0000
Y-97	3.7500 s	0.80	4.7752E+22	2.3855E+11	1.8300	2.1600	0.0000
Nb-102	1.3000 s	15.38	1.6066E+22	2.3152E+11	0.0000	0.0000	0.0000
Rb-92	4.4920 s	0.45	5.5450E+22	2.3125E+11	1.3995	2.9000	0.0000
Nb-100	1.5000 s	13.33	1.8399E+22	2.2979E+11	0.7117	2.5460	0.0000
Sr-96	1.0600 s	2.83	1.2752E+22	2.2537E+11	0.9320	1.9900	0.0000
Cs-142	1.7000 s	1.18	1.9199E+22	2.1157E+11	0.6754	2.8800	0.0000
Nb-103	1.5000 s	13.33	1.5690E+22	1.9595E+11	0.0000	0.0000	0.0000
Rb-93	5.8000 s	0.69	5.7522E+22	1.8579E+11	1.4200	2.7100	0.0000
Nb-101	7.1000 s	4.23	6.6249E+22	1.7480E+11	0.2700	1.8320	0.0000
Y-99	1.4770 s	0.34	1.3260E+22	1.6818E+11	0.8180	3.1200	0.0000
Zr-102	2.9000 s	6.90	2.5108E+22	1.6220E+11	0.2374	1.9850	0.0000
Ba-145	4.3100 s	3.71	3.3259E+22	1.4456E+11	0.3100	2.0200	0.0000
Rb-94	2.7020 s	0.26	2.0281E+22	1.4061E+11	2.7400	3.2400	0.0000
Kr-91	8.5700 s	0.47	5.3216E+22	1.1633E+11	1.7310	2.0880	0.0000
Ba-143	14.500 s	2.07	8.6893E+22	1.1226E+11	0.2310	1.7200	0.0000
Y-97m	1.1700 s	2.56	6.8733E+21	1.1005E+11	1.8000	2.4100	0.0000
Ba-144	11.500 s	1.74	6.3791E+22	1.0392E+11	0.4690	0.8533	0.0000
Kr-92	1.8400 s	0.43	1.0071E+22	1.0253E+11	1.4050	1.9900	0.0000
Y-98	0.59000 s	5.09	3.0750E+21	9.7637E+10	0.9070	3.7400	0.0000
Y-98m	2.0000 s	10.00	1.0361E+22	9.7048E+10	3.0400	2.6300	0.0000
Cs-143	1.7910 s	0.39	8.6604E+21	9.0588E+10	0.7010	2.7600	0.0000
Br-89	4.3700 s	1.14	2.0333E+22	8.7164E+10	1.5880	2.5100	0.0000
La-147	4.0150 s	0.20	1.8642E+22	8.6983E+10	0.1836	2.0380	0.0000
Sr-95	23.900 s	0.59	1.0774E+23	8.4448E+10	1.0200	2.3000	0.0000
Ba-146	2.2200 s	3.15	9.9923E+21	8.4321E+10	0.8094	1.1750	0.0000
Xe-140	13.600 s	0.74	5.4583E+22	7.5187E+10	1.1500	1.2200	0.0000
La-146	6.2700 s	1.59	2.4722E+22	7.3865E+10	1.4900	2.1600	0.0000
Xe-141	1.7300 s	0.58	6.4310E+21	6.9640E+10	0.6594	1.7940	0.0000
Zr-98	30.700 s	1.30	1.1258E+23	6.8700E+10	0.0019	0.9070	0.0000
I-138	6.4600 s	0.93	2.3583E+22	6.8389E+10	1.8900	2.5900	0.0000
Cs-141	24.940 s	0.24	8.6166E+22	6.4724E+10	1.0100	1.8800	0.0000
Te-135	19.000 s	1.05	5.6288E+22	5.5499E+10	0.3843	2.4090	0.0000
Br-90	1.9000 s	2.11	5.6049E+21	5.5264E+10	1.3710	2.9250	0.0000
Kr-90	32.320 s	0.28	9.1714E+22	5.3161E+10	1.3230	1.3600	0.0000
Nb-102m	4.3000 s	9.30	1.1768E+22	5.1269E+10	2.0920	2.2690	0.0000
Nb-99	15.000 s	1.33	3.9611E+22	4.9470E+10	0.1680	1.4530	0.0000
Ce-149	5.3000 s	3.77	1.3810E+22	4.8815E+10	0.0000	0.0000	0.0000
Y-96m	9.6200 s	1.56	2.4346E+22	4.7410E+10	3.9700	0.0049	0.0000
Br-88	16.500 s	0.61	3.9647E+22	4.5014E+10	0.2244	0.0000	0.0000
Zr-103	1.3000 s	7.69	3.1084E+21	4.4793E+10	0.0000	0.0000	0.0000
I-137	24.510 s	0.24	5.4650E+22	4.1770E+10	1.1400	1.9600	0.0000
I-139	2.3000 s	1.30	5.1229E+21	4.1726E+10	0.4984	2.5300	0.0000
Xe-139	39.680 s	0.35	8.7132E+22	4.1137E+10	0.8940	1.7800	0.0000
Se-87	5.2900 s	2.08	1.0455E+22	3.7024E+10	0.6619	2.9570	0.0000
La-145	24.800 s	8.06	4.6928E+22	3.5449E+10	0.6430	1.4800	0.0000
Xe-142	1.2200 s	1.64	2.2935E+21	3.5218E+10	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 1102
Total activity (Ci) = 7.20114E+12

Total number of decays = 1.44644E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 8.9159
Average chain length = 3.5476

Average gamma E (MeV) = 0.88723
Average beta E (MeV) = 1.7550
Average alpha E (MeV) = 4.58282E-25

Composite Exposure Rate Conversion Factor = 15.8389330 R/hr per Ci/m2
Composite ECF per FGR table = 0.237373009 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.0904007 Rem/hr per Ci/m2

Fission Product Source

Point in time = 4.03891134 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Zr-99	2.2000	s	4.55	4.3847E+22	3.7337E+11	0.8600	1.5500	0.0000
Y-96	5.3400	s	0.94	6.9568E+22	2.4406E+11	0.0010	0.1490	0.0000
Zr-100	7.1000	s	5.63	8.9754E+22	2.3682E+11	0.2589	1.3410	0.0000
Nb-100	1.5000	s	13.33	1.8780E+22	2.3455E+11	0.7117	2.5460	0.0000
Rb-92	4.4920	s	0.45	5.1443E+22	2.1454E+11	1.3995	2.9000	0.0000
Zr-101	2.3000	s	4.35	2.5997E+22	2.1175E+11	0.5564	2.2060	0.0000
Y-97	3.7500	s	0.80	4.1337E+22	2.0651E+11	1.8300	2.1600	0.0000
Nb-102	1.3000	s	15.38	1.4008E+22	2.0186E+11	0.0000	0.0000	0.0000
Nb-101	7.1000	s	4.23	6.8091E+22	1.7966E+11	0.2700	1.8320	0.0000
Rb-93	5.8000	s	0.69	5.2779E+22	1.7047E+11	1.4200	2.7100	0.0000
Cs-142	1.7000	s	1.18	1.4534E+22	1.6016E+11	0.6754	2.8800	0.0000
Nb-103	1.5000	s	13.33	1.1710E+22	1.4625E+11	0.0000	0.0000	0.0000
Zr-102	2.9000	s	6.90	2.0715E+22	1.3381E+11	0.2374	1.9850	0.0000
Sr-96	1.0600	s	2.83	7.5334E+21	1.3314E+11	0.9320	1.9900	0.0000
Ba-145	4.3100	s	3.71	2.9263E+22	1.2719E+11	0.3100	2.0200	0.0000
Y-99	1.4770	s	0.34	9.0893E+21	1.1528E+11	0.8180	3.1200	0.0000
Rb-94	2.7020	s	0.26	1.6497E+22	1.1438E+11	2.7400	3.2400	0.0000
Ba-143	14.5000	s	2.07	8.5864E+22	1.1094E+11	0.2310	1.7200	0.0000
Kr-91	8.5700	s	0.47	4.9894E+22	1.0907E+11	1.7310	2.0880	0.0000
Ba-144	11.5000	s	1.74	6.1240E+22	9.9762E+10	0.4690	0.8533	0.0000
Sr-95	23.9000	s	0.59	1.0529E+23	8.2533E+10	1.0200	2.3000	0.0000
Br-89	4.3700	s	1.14	1.7904E+22	7.6752E+10	1.5880	2.5100	0.0000
La-147	4.0150	s	0.20	1.6444E+22	7.6727E+10	0.1836	2.0380	0.0000
Kr-92	1.8400	s	0.43	7.4369E+21	7.5718E+10	1.4050	1.9900	0.0000
La-146	6.2700	s	1.59	2.4738E+22	7.3912E+10	1.4900	2.1600	0.0000
Y-98m	2.0000	s	10.00	7.8386E+21	7.3423E+10	3.0400	2.6300	0.0000
Xe-140	13.6000	s	0.74	5.2506E+22	7.2326E+10	1.1500	1.2200	0.0000
Zr-98	30.7000	s	1.30	1.1508E+23	7.0223E+10	0.0019	0.9070	0.0000
Y-97m	1.1700	s	2.56	4.2908E+21	6.8704E+10	1.8000	2.4100	0.0000
Cs-143	1.7910	s	0.39	6.3492E+21	6.6412E+10	0.7010	2.7600	0.0000
Ba-146	2.2200	s	3.15	7.7720E+21	6.5585E+10	0.8094	1.1750	0.0000
Cs-141	24.9400	s	0.24	8.6015E+22	6.4610E+10	1.0100	1.8800	0.0000
I-138	6.4600	s	0.93	2.1816E+22	6.3265E+10	1.8900	2.5900	0.0000
Nb-99	15.0000	s	1.33	4.5686E+22	5.7058E+10	0.1680	1.4530	0.0000
Te-135	19.0000	s	1.05	5.5093E+22	5.4321E+10	0.3843	2.4090	0.0000
Kr-90	32.3200	s	0.28	9.1219E+22	5.2873E+10	1.3230	1.3600	0.0000
Xe-141	1.7300	s	0.58	4.6601E+21	5.0463E+10	0.6594	1.7940	0.0000
Y-98	0.590000	s	5.09	1.4802E+21	4.6999E+10	0.9070	3.7400	0.0000
Nb-102m	4.3000	s	9.30	1.0336E+22	4.5031E+10	2.0920	2.2690	0.0000
Y-96m	9.6200	s	1.56	2.2974E+22	4.4739E+10	3.9700	0.0049	0.0000
Ce-149	5.3000	s	3.77	1.2603E+22	4.4548E+10	0.0000	0.0000	0.0000
Br-88	16.5000	s	0.61	3.9038E+22	4.4323E+10	0.2244	0.0000	0.0000
Br-90	1.9000	s	2.11	4.1789E+21	4.1204E+10	1.3710	2.9250	0.0000
I-137	24.5100	s	0.24	5.3884E+22	4.1185E+10	1.1400	1.9600	0.0000
Xe-139	39.6800	s	0.35	8.6916E+22	4.1035E+10	0.8940	1.7800	0.0000
Nb-98	2.8600	s	2.10	6.0071E+21	3.9348E+10	0.5110	1.7770	0.0000
La-145	24.8000	s	8.06	4.9879E+22	3.7679E+10	0.6430	1.4800	0.0000
Se-87	5.2900	s	2.08	9.4137E+21	3.3337E+10	0.6619	2.9570	0.0000
I-139	2.3000	s	1.30	4.0219E+21	3.2759E+10	0.4984	2.5300	0.0000
Nb-104	4.9000	s	6.12	8.0499E+21	3.0776E+10	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 1102
Total activity (Ci) = 6.15557E+12

Total number of decays = 1.64457E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 10.137
Average chain length = 3.5476

Average gamma E (MeV) = 0.88298
Average beta E (MeV) = 1.7211
Average alpha E (MeV) = 5.36126E-25

Composite Exposure Rate Conversion Factor = 15.7357349 R/hr per Ci/m2
Composite ECF per FGR table = 0.326293647 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.0372963 Rem/hr per Ci/m2

Fission Product Source

Point in time = 5.04420424 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Zr-99	2.2000	s	4.55	3.4791E+22	2.9626E+11	0.8600	1.5500	0.0000
Nb-100	1.5000	s	13.33	1.8503E+22	2.3108E+11	0.7117	2.5460	0.0000
Y-96	5.3400	s	0.94	6.4436E+22	2.2605E+11	0.0010	0.1490	0.0000
Zr-100	7.1000	s	5.63	8.1673E+22	2.1550E+11	0.2589	1.3410	0.0000
Rb-92	4.4920	s	0.45	4.6212E+22	1.9273E+11	1.3995	2.9000	0.0000
Nb-101	7.1000	s	4.23	6.8184E+22	1.7991E+11	0.2700	1.8320	0.0000
Y-97	3.7500	s	0.80	3.4389E+22	1.7180E+11	1.8300	2.1600	0.0000
Nb-102	1.3000	s	15.38	1.1584E+22	1.6694E+11	0.0000	0.0000	0.0000
Zr-101	2.3000	s	4.35	1.9213E+22	1.5649E+11	0.5564	2.2060	0.0000
Rb-93	5.8000	s	0.69	4.7208E+22	1.5248E+11	1.4200	2.7100	0.0000
Cs-142	1.7000	s	1.18	1.0153E+22	1.1188E+11	0.6754	2.8800	0.0000
Ba-145	4.3100	s	3.71	2.4912E+22	1.0828E+11	0.3100	2.0200	0.0000
Ba-143	14.5000	s	2.07	8.3809E+22	1.0828E+11	0.2310	1.7200	0.0000
Zr-102	2.9000	s	6.90	1.6290E+22	1.0523E+11	0.2374	1.9850	0.0000
Kr-91	8.5700	s	0.47	4.6010E+22	1.0058E+11	1.7310	2.0880	0.0000
Nb-103	1.5000	s	13.33	8.0167E+21	1.0012E+11	0.0000	0.0000	0.0000
Ba-144	11.5000	s	1.74	5.7951E+22	9.4404E+10	0.4690	0.8533	0.0000
Rb-94	2.7020	s	0.26	1.2747E+22	8.8378E+10	2.7400	3.2400	0.0000
Sr-95	23.9000	s	0.59	1.0228E+23	8.0170E+10	1.0200	2.3000	0.0000
La-146	6.2700	s	1.59	2.4112E+22	7.2042E+10	1.4900	2.1600	0.0000
Y-99	1.4770	s	0.34	5.6708E+21	7.1927E+10	0.8180	3.1200	0.0000
Zr-98	30.7000	s	1.30	1.1587E+23	7.0706E+10	0.0019	0.9070	0.0000
Sr-96	1.0600	s	2.83	3.9039E+21	6.8995E+10	0.9320	1.9900	0.0000
Xe-140	13.6000	s	0.74	4.9954E+22	6.8811E+10	1.1500	1.2200	0.0000
Br-89	4.3700	s	1.14	1.5267E+22	6.5449E+10	1.5880	2.5100	0.0000
La-147	4.0150	s	0.20	1.3959E+22	6.5132E+10	0.1836	2.0380	0.0000
Nb-99	15.0000	s	1.33	5.1278E+22	6.4042E+10	0.1680	1.4530	0.0000
Cs-141	24.9400	s	0.24	8.5169E+22	6.3975E+10	1.0100	1.8800	0.0000
I-138	6.4600	s	0.93	1.9731E+22	5.7220E+10	1.8900	2.5900	0.0000
Te-135	19.0000	s	1.05	5.3486E+22	5.2736E+10	0.3843	2.4090	0.0000
Kr-90	32.3200	s	0.28	9.0233E+22	5.2302E+10	1.3230	1.3600	0.0000
Kr-92	1.8400	s	0.43	5.0925E+21	5.1849E+10	1.4050	1.9900	0.0000
Y-98m	2.0000	s	10.00	5.5326E+21	5.1823E+10	3.0400	2.6300	0.0000
Ba-146	2.2200	s	3.15	5.6783E+21	4.7917E+10	0.8094	1.1750	0.0000
Nb-98	2.8600	s	2.10	7.0377E+21	4.6099E+10	0.5110	1.7770	0.0000
Cs-143	1.7910	s	0.39	4.3053E+21	4.5033E+10	0.7010	2.7600	0.0000
Br-88	16.5000	s	0.61	3.8010E+22	4.3156E+10	0.2244	0.0000	0.0000
Y-96m	9.6200	s	1.56	2.1369E+22	4.1613E+10	3.9700	0.0049	0.0000
Xe-139	39.6800	s	0.35	8.6350E+22	4.0767E+10	0.8940	1.7800	0.0000
I-137	24.5100	s	0.24	5.2822E+22	4.0373E+10	1.1400	1.9600	0.0000
La-145	24.8000	s	8.06	5.2805E+22	3.9889E+10	0.6430	1.4800	0.0000
Ce-149	5.3000	s	3.77	1.1168E+22	3.9476E+10	0.0000	0.0000	0.0000
Nb-102m	4.3000	s	9.30	8.7897E+21	3.8294E+10	2.0920	2.2690	0.0000
Y-97m	1.1700	s	2.56	2.3721E+21	3.7981E+10	1.8000	2.4100	0.0000
Xe-141	1.7300	s	0.58	3.1156E+21	3.3738E+10	0.6594	1.7940	0.0000
Se-87	5.2900	s	2.08	8.2542E+21	2.9231E+10	0.6619	2.9570	0.0000
Br-90	1.9000	s	2.11	2.8960E+21	2.8554E+10	1.3710	2.9250	0.0000
Se-86	15.3000	s	5.88	2.2558E+22	2.7621E+10	2.2690	1.4390	0.0000
Sr-94	1.2550	m	0.53	1.1004E+23	2.7377E+10	1.4270	0.8350	0.0000
Nb-104	4.9000	s	6.12	7.1414E+21	2.7303E+10	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 1102
Total activity (Ci) = 5.19417E+12

Total number of decays = 1.85472E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 11.432
Average chain length = 3.5476

Average gamma E (MeV) = 0.88035
Average beta E (MeV) = 1.6920
Average alpha E (MeV) = 6.35358E-25

Composite Exposure Rate Conversion Factor = 15.6612091 R/hr per Ci/m2
Composite ECF per FGR table = 0.446541280 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.0044365 Rem/hr per Ci/m2

Fission Product Source

Point in time = 6.29971647 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000 s 13.33	1.7473E+22	2.1822E+11	0.7117	2.5460	0.0000	0.0000
Zr-99	2.2000 s 4.55	2.5436E+22	2.1660E+11	0.8600	1.5500	0.0000	0.0000
Y-96	5.3400 s 0.94	5.6741E+22	1.9906E+11	0.0010	0.1490	0.0000	0.0000
Zr-100	7.1000 s 5.63	7.2385E+22	1.9099E+11	0.2589	1.3410	0.0000	0.0000
Nb-101	7.1000 s 4.23	6.5994E+22	1.7413E+11	0.2700	1.8320	0.0000	0.0000
Rb-92	4.4920 s 0.45	3.9805E+22	1.6600E+11	1.3995	2.9000	0.0000	0.0000
Y-97	3.7500 s 0.80	2.7285E+22	1.3630E+11	1.8300	2.1600	0.0000	0.0000
Rb-93	5.8000 s 0.69	4.0903E+22	1.3211E+11	1.4200	2.7100	0.0000	0.0000
Nb-102	1.3000 s 15.38	8.9589E+21	1.2910E+11	0.0000	0.0000	0.0000	0.0000
Zr-101	2.3000 s 4.35	1.3163E+22	1.0721E+11	0.5564	2.2060	0.0000	0.0000
Ba-143	14.500 s 2.07	8.0511E+22	1.0402E+11	0.2310	1.7200	0.0000	0.0000
Kr-91	8.5700 s 0.47	4.1571E+22	9.0873E+10	1.7310	2.0880	0.0000	0.0000
Ba-145	4.3100 s 3.71	2.0363E+22	8.8511E+10	0.3100	2.0200	0.0000	0.0000
Ba-144	11.500 s 1.74	5.3904E+22	8.7811E+10	0.4690	0.8533	0.0000	0.0000
Zr-102	2.9000 s 6.90	1.2067E+22	7.7952E+10	0.2374	1.9850	0.0000	0.0000
Sr-95	23.900 s 0.59	9.8624E+22	7.7305E+10	1.0200	2.3000	0.0000	0.0000
Cs-142	1.7000 s 1.18	6.4014E+21	7.0542E+10	0.6754	2.8800	0.0000	0.0000
Zr-98	30.700 s 1.30	1.1501E+23	7.0184E+10	0.0019	0.9070	0.0000	0.0000
Nb-99	15.000 s 1.33	5.5650E+22	6.9502E+10	0.1680	1.4530	0.0000	0.0000
La-146	6.2700 s 1.59	2.2699E+22	6.7820E+10	1.4900	2.1600	0.0000	0.0000
Xe-140	13.600 s 0.74	4.6893E+22	6.4594E+10	1.1500	1.2200	0.0000	0.0000
Rb-94	2.7020 s 0.26	9.2369E+21	6.4042E+10	2.7400	3.2400	0.0000	0.0000
Cs-141	24.940 s 0.24	8.3458E+22	6.2689E+10	1.0100	1.8800	0.0000	0.0000
Nb-103	1.5000 s 13.33	4.9123E+21	6.1350E+10	0.0000	0.0000	0.0000	0.0000
Br-89	4.3700 s 1.14	1.2511E+22	5.3633E+10	1.5880	2.5100	0.0000	0.0000
La-147	4.0150 s 0.20	1.1308E+22	5.2762E+10	0.1836	2.0380	0.0000	0.0000
Nb-98	2.8600 s 2.10	8.0152E+21	5.2501E+10	0.5110	1.7770	0.0000	0.0000
Kr-90	32.320 s 0.28	8.8627E+22	5.1371E+10	1.3230	1.3600	0.0000	0.0000
Te-135	19.000 s 1.05	5.1390E+22	5.0670E+10	0.3843	2.4090	0.0000	0.0000
I-138	6.4600 s 0.93	1.7348E+22	5.0307E+10	1.8900	2.5900	0.0000	0.0000
La-145	24.800 s 8.06	5.5458E+22	4.1893E+10	0.6430	1.4800	0.0000	0.0000
Br-88	16.500 s 0.61	3.6495E+22	4.1436E+10	0.2244	0.0000	0.0000	0.0000
Xe-139	39.680 s 0.35	8.5315E+22	4.0279E+10	0.8940	1.7800	0.0000	0.0000
Y-99	1.4770 s 0.34	3.1460E+21	3.9903E+10	0.8180	3.1200	0.0000	0.0000
I-137	24.510 s 0.24	5.1385E+22	3.9275E+10	1.1400	1.9600	0.0000	0.0000
Y-96m	9.6200 s 1.56	1.9521E+22	3.8014E+10	3.9700	0.0049	0.0000	0.0000
Ce-149	5.3000 s 3.77	9.5461E+21	3.3742E+10	0.0000	0.0000	0.0000	0.0000
Y-98m	2.0000 s 10.00	3.5806E+21	3.3539E+10	3.0400	2.6300	0.0000	0.0000
Ba-146	2.2200 s 3.15	3.8369E+21	3.2378E+10	0.8094	1.1750	0.0000	0.0000
Kr-92	1.8400 s 0.43	3.1734E+21	3.2310E+10	1.4050	1.9900	0.0000	0.0000
Nb-102m	4.3000 s 9.30	7.1793E+21	3.1278E+10	2.0920	2.2690	0.0000	0.0000
Sr-96	1.0600 s 2.83	1.7177E+21	3.0357E+10	0.9320	1.9900	0.0000	0.0000
Sr-94	1.2550 m 0.53	1.1191E+23	2.7843E+10	1.4270	0.8350	0.0000	0.0000
Cs-143	1.7910 s 0.39	2.6490E+21	2.7708E+10	0.7010	2.7600	0.0000	0.0000
La-144	40.800 s 0.98	5.8009E+22	2.6635E+10	2.1700	1.6100	0.0000	0.0000
Se-86	15.300 s 5.88	2.1327E+22	2.6113E+10	2.2690	1.4390	0.0000	0.0000
Se-87	5.2900 s 2.08	7.0030E+21	2.4800E+10	0.6619	2.9570	0.0000	0.0000
Nb-104	4.9000 s 6.12	6.0810E+21	2.3249E+10	0.0000	0.0000	0.0000	0.0000
Cs-140	1.0620 m 0.47	7.8610E+22	2.3111E+10	2.2600	1.7500	0.0000	0.0000
Te-136	17.500 s 1.14	2.1243E+22	2.2741E+10	2.1700	1.2200	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 1100
Total activity (Ci) = 4.32598E+12

Total number of decays = 2.07472E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 12.789
Average chain length = 3.5476

Average gamma E (MeV) = 0.87989
Average beta E (MeV) = 1.6674
Average alpha E (MeV) = 7.62869E-25

Composite Exposure Rate Conversion Factor = 15.6259508 R/hr per Ci/m2
Composite ECF per FGR table = 0.604755878 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.9986782 Rem/hr per Ci/m2

Fission Product Source

Point in time = 7.86772490 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000	s	13.33	1.5712E+22	1.9623E+11	0.7117	2.5460	0.0000
Y-96	5.3400	s	0.94	4.7272E+22	1.6584E+11	0.0010	0.1490	0.0000
Zr-100	7.1000	s	5.63	6.2155E+22	1.6400E+11	0.2589	1.3410	0.0000
Nb-101	7.1000	s	4.23	6.1195E+22	1.6147E+11	0.2700	1.8320	0.0000
Zr-99	2.2000	s	4.55	1.6754E+22	1.4267E+11	0.8600	1.5500	0.0000
Rb-92	4.4920	s	0.45	3.2493E+22	1.3551E+11	1.3995	2.9000	0.0000
Rb-93	5.8000	s	0.69	3.4070E+22	1.1004E+11	1.4200	2.7100	0.0000
Y-97	3.7500	s	0.80	2.0425E+22	1.0204E+11	1.8300	2.1600	0.0000
Ba-143	14.500	s	2.07	7.5837E+22	9.7980E+10	0.2310	1.7200	0.0000
Nb-102	1.3000	s	15.38	6.3735E+21	9.1846E+10	0.0000	0.0000	0.0000
Kr-91	8.5700	s	0.47	3.6620E+22	8.0051E+10	1.7310	2.0880	0.0000
Ba-144	11.500	s	1.74	4.9125E+22	8.0026E+10	0.4690	0.8533	0.0000
Sr-95	23.900	s	0.59	9.4240E+22	7.3868E+10	1.0200	2.3000	0.0000
Nb-99	15.000	s	1.33	5.8026E+22	7.2469E+10	0.1680	1.4530	0.0000
Ba-145	4.3100	s	3.71	1.5826E+22	6.8789E+10	0.3100	2.0200	0.0000
Zr-98	30.700	s	1.30	1.1262E+23	6.8722E+10	0.0019	0.9070	0.0000
Zr-101	2.3000	s	4.35	8.2061E+21	6.6839E+10	0.5564	2.2060	0.0000
La-146	6.2700	s	1.59	2.0440E+22	6.1072E+10	1.4900	2.1600	0.0000
Cs-141	24.940	s	0.24	8.0757E+22	6.0661E+10	1.0100	1.8800	0.0000
Xe-140	13.600	s	0.74	4.3306E+22	5.9653E+10	1.1500	1.2200	0.0000
Nb-98	2.8600	s	2.10	8.8335E+21	5.7861E+10	0.5110	1.7770	0.0000
Zr-102	2.9000	s	6.90	8.2954E+21	5.3587E+10	0.2374	1.9850	0.0000
Kr-90	32.320	s	0.28	8.6287E+22	5.0015E+10	1.3230	1.3600	0.0000
Te-135	19.000	s	1.05	4.8745E+22	4.8062E+10	0.3843	2.4090	0.0000
La-145	24.800	s	8.06	5.7517E+22	4.3448E+10	0.6430	1.4800	0.0000
Rb-94	2.7020	s	0.26	6.1778E+21	4.2833E+10	2.7400	3.2400	0.0000
I-138	6.4600	s	0.93	1.4725E+22	4.2701E+10	1.8900	2.5900	0.0000
Br-89	4.3700	s	1.14	9.7561E+21	4.1823E+10	1.5880	2.5100	0.0000
La-147	4.0150	s	0.20	8.6547E+21	4.0382E+10	0.1836	2.0380	0.0000
Xe-139	39.680	s	0.35	8.3693E+22	3.9513E+10	0.8940	1.7800	0.0000
Br-88	16.500	s	0.61	3.4457E+22	3.9122E+10	0.2244	0.0000	0.0000
Cs-142	1.7000	s	1.18	3.5441E+21	3.9055E+10	0.6754	2.8800	0.0000
I-137	24.510	s	0.24	4.9496E+22	3.7831E+10	1.1400	1.9600	0.0000
Y-96m	9.6200	s	1.56	1.7435E+22	3.3953E+10	3.9700	0.0049	0.0000
Nb-103	1.5000	s	13.33	2.6125E+21	3.2628E+10	0.0000	0.0000	0.0000
La-144	40.800	s	0.98	6.1284E+22	2.8139E+10	2.1700	1.6100	0.0000
Sr-94	1.2550	m	0.53	1.1304E+23	2.8123E+10	1.4270	0.8350	0.0000
Ce-149	5.3000	s	3.77	7.8098E+21	2.7605E+10	0.0000	0.0000	0.0000
Se-86	15.300	s	5.88	1.9872E+22	2.4331E+10	2.2690	1.4390	0.0000
Nb-102m	4.3000	s	9.30	5.5758E+21	2.4292E+10	2.0920	2.2690	0.0000
Cs-140	1.0620	m	0.47	8.0853E+22	2.3771E+10	2.2600	1.7500	0.0000
Rb-91	58.400	s	0.68	7.1113E+22	2.2812E+10	2.3400	1.5800	0.0000
Te-136	17.500	s	1.14	1.9967E+22	2.1375E+10	2.1700	1.2200	0.0000
Pr-150	6.1000	s	6.56	6.9333E+21	2.1293E+10	0.5558	1.8950	0.0000
Se-87	5.2900	s	2.08	5.7026E+21	2.0195E+10	0.6619	2.9570	0.0000
Ba-146	2.2200	s	3.15	2.3516E+21	1.9844E+10	0.8094	1.1750	0.0000
Mo-103	1.1320	m	0.88	7.1046E+22	1.9596E+10	0.0000	0.0000	0.0000
Y-98m	2.0000	s	10.00	2.0794E+21	1.9478E+10	3.0400	2.6300	0.0000
Y-99	1.4770	s	0.34	1.5072E+21	1.9117E+10	0.8180	3.1200	0.0000
Nb-104	4.9000	s	6.12	4.9266E+21	1.8835E+10	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867390D+24

Total number of nuclides = 1100
Total activity (Ci) = 3.55751E+12

Total number of decays = 2.30209E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 14.190
Average chain length = 3.5476

Average gamma E (MeV) = 0.88232
Average beta E (MeV) = 1.6452
Average alpha E (MeV) = 9.27659E-25

Composite Exposure Rate Conversion Factor = 15.6425323 R/hr per Ci/m2
Composite ECF per FGR table = 0.806183457 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.0289984 Rem/hr per Ci/m2

Fission Product Source

Point in time = 9.82601738 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000 s	13.33	1.3374E+22	1.6702E+11	0.7117	2.5460	0.0000
Nb-101	7.1000 s	4.23	5.3845E+22	1.4207E+11	0.2700	1.8320	0.0000
Zr-100	7.1000 s	5.63	5.1350E+22	1.3549E+11	0.2589	1.3410	0.0000
Y-96	5.3400 s	0.94	3.7044E+22	1.2996E+11	0.0010	0.1490	0.0000
Rb-92	4.4920 s	0.45	2.4796E+22	1.0341E+11	1.3995	2.9000	0.0000
Ba-143	14.5000 s	2.07	6.9777E+22	9.0151E+10	0.2310	1.7200	0.0000
Rb-93	5.8000 s	0.69	2.7035E+22	8.7323E+10	1.4200	2.7100	0.0000
Zr-99	2.2000 s	4.55	9.6741E+21	8.2378E+10	0.8600	1.5500	0.0000
Nb-99	15.0000 s	1.33	5.7809E+22	7.2199E+10	0.1680	1.4530	0.0000
Ba-144	11.5000 s	1.74	4.3687E+22	7.1166E+10	0.4690	0.8533	0.0000
Y-97	3.7500 s	0.80	1.4224E+22	7.1057E+10	1.8300	2.1600	0.0000
Sr-95	23.9000 s	0.59	8.9036E+22	6.9790E+10	1.0200	2.3000	0.0000
Kr-91	8.5700 s	0.47	3.1256E+22	6.8325E+10	1.7310	2.0880	0.0000
Zr-98	30.7000 s	1.30	1.0876E+23	6.6370E+10	0.0019	0.9070	0.0000
Nb-98	2.8600 s	2.10	9.3885E+21	6.1497E+10	0.5110	1.7770	0.0000
Nb-102	1.3000 s	15.38	4.0917E+21	5.8963E+10	0.0000	0.0000	0.0000
Cs-141	24.9400 s	0.24	7.7010E+22	5.7846E+10	1.0100	1.8800	0.0000
Xe-140	13.6000 s	0.74	3.9197E+22	5.3993E+10	1.1500	1.2200	0.0000
La-146	6.2700 s	1.59	1.7418E+22	5.2042E+10	1.4900	2.1600	0.0000
Ba-145	4.3100 s	3.71	1.1551E+22	5.0206E+10	0.3100	2.0200	0.0000
Kr-90	32.3200 s	0.28	8.3127E+22	4.8183E+10	1.3230	1.3600	0.0000
Te-135	19.0000 s	1.05	4.5515E+22	4.4877E+10	0.3843	2.4090	0.0000
La-145	24.8000 s	8.06	5.8609E+22	4.4273E+10	0.6430	1.4800	0.0000
Xe-139	39.6800 s	0.35	8.1380E+22	3.8421E+10	0.8940	1.7800	0.0000
Zr-101	2.3000 s	4.35	4.5481E+21	3.7045E+10	0.5564	2.2060	0.0000
Br-88	16.5000 s	0.61	3.1899E+22	3.6217E+10	0.2244	0.0000	0.0000
I-137	24.5100 s	0.24	4.7088E+22	3.5991E+10	1.1400	1.9600	0.0000
I-138	6.4600 s	0.93	1.1967E+22	3.4703E+10	1.8900	2.5900	0.0000
Zr-102	2.9000 s	6.90	5.1947E+21	3.3557E+10	0.2374	1.9850	0.0000
Br-89	4.3700 s	1.14	7.1512E+21	3.0656E+10	1.5880	2.5100	0.0000
La-144	40.8000 s	0.98	6.4659E+22	2.9689E+10	2.1700	1.6100	0.0000
Y-96m	9.6200 s	1.56	1.5141E+22	2.9485E+10	3.9700	0.0049	0.0000
La-147	4.0150 s	0.20	6.1809E+21	2.8840E+10	0.1836	2.0380	0.0000
Sr-94	1.2550 m	0.53	1.1319E+23	2.8161E+10	1.4270	0.8350	0.0000
Rb-94	2.7020 s	0.26	3.7382E+21	2.5918E+10	2.7400	3.2400	0.0000
Cs-140	1.0620 m	0.47	8.3218E+22	2.4466E+10	2.2600	1.7500	0.0000
Rb-91	58.4000 s	0.68	7.4780E+22	2.3988E+10	2.3400	1.5800	0.0000
Se-86	15.3000 s	5.88	1.8187E+22	2.2269E+10	2.2690	1.4390	0.0000
Ce-149	5.3000 s	3.77	6.0582E+21	2.1414E+10	0.0000	0.0000	0.0000
Te-136	17.5000 s	1.14	1.8478E+22	1.9781E+10	2.1700	1.2200	0.0000
Mo-103	1.1320 m	0.88	7.1245E+22	1.9651E+10	0.0000	0.0000	0.0000
Pr-150	6.1000 s	6.56	6.3121E+21	1.9385E+10	0.5558	1.8950	0.0000
Cs-142	1.7000 s	1.18	1.6655E+21	1.8353E+10	0.6754	2.8800	0.0000
Nb-102m	4.3000 s	9.30	4.0664E+21	1.7716E+10	2.0920	2.2690	0.0000
Se-87	5.2900 s	2.08	4.4120E+21	1.5624E+10	0.6619	2.9570	0.0000
Mo-106	8.7300 s	1.38	7.1618E+21	1.5369E+10	0.0000	0.0000	0.0000
Nb-103	1.5000 s	13.33	1.1606E+21	1.4495E+10	0.0000	0.0000	0.0000
Nb-104	4.9000 s	6.12	3.7591E+21	1.4372E+10	0.0000	0.0000	0.0000
La-146m	10.0000 s	1.00	7.6315E+21	1.4297E+10	1.3100	0.9883	0.0000
Mo-105	35.6000 s	4.49	2.5761E+22	1.3556E+10	0.5511	1.9000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 1096
Total activity (Ci) = 2.89253E+12

Total number of decays = 2.53424E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 15.621
Average chain length = 3.5476

Average gamma E (MeV) = 0.88855
Average beta E (MeV) = 1.6229
Average alpha E (MeV) = 1.14092E-24

Composite Exposure Rate Conversion Factor = 15.7264147 R/hr per Ci/m2
Composite ECF per FGR table = 1.05258369 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.1069221 Rem/hr per Ci/m2

Fission Product Source

Point in time = 12.2717333 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000 s 13.33	1.0710E+22	1.3376E+11	0.7117	2.5460	0.0000	0.0000
Nb-101	7.1000 s 4.23	4.4487E+22	1.1738E+11	0.2700	1.8320	0.0000	0.0000
Zr-100	7.1000 s 5.63	4.0445E+22	1.0672E+11	0.2589	1.3410	0.0000	0.0000
Y-96	5.3400 s 0.94	2.7080E+22	9.5001E+10	0.0010	0.1490	0.0000	0.0000
Ba-143	14.500 s 2.07	6.2459E+22	8.0696E+10	0.2310	1.7200	0.0000	0.0000
Rb-92	4.4920 s 0.45	1.7411E+22	7.2612E+10	1.3995	2.9000	0.0000	0.0000
Nb-99	15.000 s 1.33	5.4811E+22	6.8454E+10	0.1680	1.4530	0.0000	0.0000
Rb-93	5.8000 s 0.69	2.0212E+22	6.5282E+10	1.4200	2.7100	0.0000	0.0000
Sr-95	23.900 s 0.59	8.2940E+22	6.5011E+10	1.0200	2.3000	0.0000	0.0000
Zr-98	30.700 s 1.30	1.0350E+23	6.3156E+10	0.0019	0.9070	0.0000	0.0000
Nb-98	2.8600 s 2.10	9.6014E+21	6.2892E+10	0.5110	1.7770	0.0000	0.0000
Ba-144	11.500 s 1.74	3.7707E+22	6.1426E+10	0.4690	0.8533	0.0000	0.0000
Kr-91	8.5700 s 0.47	2.5646E+22	5.6062E+10	1.7310	2.0880	0.0000	0.0000
Cs-141	24.940 s 0.24	7.2225E+22	5.4252E+10	1.0100	1.8800	0.0000	0.0000
Xe-140	13.600 s 0.74	3.4604E+22	4.7667E+10	1.1500	1.2200	0.0000	0.0000
Kr-90	32.320 s 0.28	7.9098E+22	4.5848E+10	1.3230	1.3600	0.0000	0.0000
Y-97	3.7500 s 0.80	9.0514E+21	4.5218E+10	1.8300	2.1600	0.0000	0.0000
La-145	24.800 s 8.06	5.8359E+22	4.4084E+10	0.6430	1.4800	0.0000	0.0000
La-146	6.2700 s 1.59	1.3878E+22	4.1466E+10	1.4900	2.1600	0.0000	0.0000
Te-135	19.000 s 1.05	4.1698E+22	4.1114E+10	0.3843	2.4090	0.0000	0.0000
Zr-99	2.2000 s 4.55	4.7382E+21	4.0347E+10	0.8600	1.5500	0.0000	0.0000
Xe-139	39.680 s 0.35	7.8299E+22	3.6967E+10	0.8940	1.7800	0.0000	0.0000
Ba-145	4.3100 s 3.71	7.7945E+21	3.3879E+10	0.3100	2.0200	0.0000	0.0000
I-137	24.510 s 0.24	4.4115E+22	3.3718E+10	1.1400	1.9600	0.0000	0.0000
Nb-102	1.3000 s 15.38	2.3174E+21	3.3395E+10	0.0000	0.0000	0.0000	0.0000
Br-88	16.500 s 0.61	2.8859E+22	3.2766E+10	0.2244	0.0000	0.0000	0.0000
La-144	40.800 s 0.98	6.7890E+22	3.1172E+10	2.1700	1.6100	0.0000	0.0000
Sr-94	1.2550 m 0.53	1.1222E+23	2.7919E+10	1.4270	0.8350	0.0000	0.0000
I-138	6.4600 s 0.93	9.2182E+21	2.6732E+10	1.8900	2.5900	0.0000	0.0000
Cs-140	1.0620 m 0.47	8.5565E+22	2.5156E+10	2.2600	1.7500	0.0000	0.0000
Rb-91	58.400 s 0.68	7.8167E+22	2.5075E+10	2.3400	1.5800	0.0000	0.0000
Y-96m	9.6200 s 1.56	1.2695E+22	2.4721E+10	3.9700	0.0049	0.0000	0.0000
Br-89	4.3700 s 1.14	4.8518E+21	2.0799E+10	1.5880	2.5100	0.0000	0.0000
Se-86	15.300 s 5.88	1.6280E+22	1.9934E+10	2.2690	1.4390	0.0000	0.0000
Mo-103	1.1320 m 0.88	7.0295E+22	1.9389E+10	0.0000	0.0000	0.0000	0.0000
La-147	4.0150 s 0.20	4.0541E+21	1.8916E+10	0.1836	2.0380	0.0000	0.0000
Zr-102	2.9000 s 6.90	2.8952E+21	1.8703E+10	0.2374	1.9850	0.0000	0.0000
Te-136	17.500 s 1.14	1.6772E+22	1.7955E+10	2.1700	1.2200	0.0000	0.0000
Zr-101	2.3000 s 4.35	2.1764E+21	1.7727E+10	0.5564	2.2060	0.0000	0.0000
Pr-150	6.1000 s 6.56	5.4127E+21	1.6623E+10	0.5558	1.8950	0.0000	0.0000
Ce-149	5.3000 s 3.77	4.4035E+21	1.5565E+10	0.0000	0.0000	0.0000	0.0000
Rb-94	2.7020 s 0.26	1.9961E+21	1.3840E+10	2.7400	3.2400	0.0000	0.0000
Mo-104	1.0000 m 3.33	4.2842E+22	1.3376E+10	0.1470	0.6850	0.0000	0.0000
Mo-105	35.600 s 4.49	2.4945E+22	1.3127E+10	0.5511	1.9000	0.0000	0.0000
Ce-147	57.000 s 3.51	3.9643E+22	1.3029E+10	0.2004	1.4990	0.0000	0.0000
Br-87	55.700 s 0.36	3.8523E+22	1.2957E+10	3.1060	1.6790	0.0000	0.0000
Se-85	31.700 s 2.84	2.1586E+22	1.2756E+10	2.0540	1.9310	0.0000	0.0000
Mo-106	8.7300 s 1.38	5.8987E+21	1.2658E+10	0.0000	0.0000	0.0000	0.0000
La-146m	10.000 s 1.00	6.4415E+21	1.2067E+10	1.3100	0.9883	0.0000	0.0000
Nb-102m	4.3000 s 9.30	2.7416E+21	1.1944E+10	2.0920	2.2690	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 1093
Total activity (Ci) = 2.33056E+12

Total number of decays = 2.76886E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 17.067
Average chain length = 3.5476

Average gamma E (MeV) = 0.89983
Average beta E (MeV) = 1.5985
Average alpha E (MeV) = 1.41604E-24

Composite Exposure Rate Conversion Factor = 15.8983078 R/hr per Ci/m2
Composite ECF per FGR table = 1.34004009 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.2478228 Rem/hr per Ci/m2

Fission Product Source

Point in time = 15.3261919 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000	s	13.33	8.0101E+21	1.0004E+11	0.7117	2.5460	0.0000
Nb-101	7.1000	s	4.23	3.4123E+22	9.0037E+10	0.2700	1.8320	0.0000
Zr-100	7.1000	s	5.63	3.0017E+22	7.9201E+10	0.2589	1.3410	0.0000
Ba-143	14.5000	s	2.07	5.4138E+22	6.9946E+10	0.2310	1.7200	0.0000
Y-96	5.3400	s	0.94	1.8239E+22	6.3987E+10	0.0010	0.1490	0.0000
Nb-98	2.8600	s	2.10	9.4409E+21	6.1840E+10	0.5110	1.7770	0.0000
Nb-99	15.0000	s	1.33	4.9351E+22	6.1636E+10	0.1680	1.4530	0.0000
Sr-95	23.9000	s	0.59	7.5909E+22	5.9500E+10	1.0200	2.3000	0.0000
Zr-98	30.7000	s	1.30	9.6877E+22	5.9116E+10	0.0019	0.9070	0.0000
Ba-144	11.5000	s	1.74	3.1368E+22	5.1099E+10	0.4690	0.8533	0.0000
Cs-141	24.9400	s	0.24	6.6462E+22	4.9923E+10	1.0100	1.8800	0.0000
Rb-92	4.4920	s	0.45	1.1042E+22	4.6050E+10	1.3995	2.9000	0.0000
Rb-93	5.8000	s	0.69	1.4038E+22	4.5343E+10	1.4200	2.7100	0.0000
Kr-91	8.5700	s	0.47	2.0033E+22	4.3790E+10	1.7310	2.0880	0.0000
Kr-90	32.3200	s	0.28	7.4184E+22	4.2999E+10	1.3230	1.3600	0.0000
La-145	24.8000	s	8.06	5.6473E+22	4.2659E+10	0.6430	1.4800	0.0000
Xe-140	13.6000	s	0.74	2.9616E+22	4.0795E+10	1.1500	1.2200	0.0000
Te-135	19.0000	s	1.05	3.7330E+22	3.6807E+10	0.3843	2.4090	0.0000
Xe-139	39.6800	s	0.35	7.4408E+22	3.5130E+10	0.8940	1.7800	0.0000
La-144	40.8000	s	0.98	7.0631E+22	3.2431E+10	2.1700	1.6100	0.0000
I-137	24.5100	s	0.24	4.0565E+22	3.1005E+10	1.1400	1.9600	0.0000
La-146	6.2700	s	1.59	1.0203E+22	3.0486E+10	1.4900	2.1600	0.0000
Br-88	16.5000	s	0.61	2.5411E+22	2.8851E+10	0.2244	0.0000	0.0000
Sr-94	1.2550	m	0.53	1.1007E+23	2.7383E+10	1.4270	0.8350	0.0000
Rb-91	58.4000	s	0.68	8.0893E+22	2.5949E+10	2.3400	1.5800	0.0000
Cs-140	1.0620	m	0.47	8.7674E+22	2.5776E+10	2.2600	1.7500	0.0000
Y-97	3.7500	s	0.80	5.1467E+21	2.5711E+10	1.8300	2.1600	0.0000
Ba-145	4.3100	s	3.71	4.7693E+21	2.0730E+10	0.3100	2.0200	0.0000
Y-96m	9.6200	s	1.56	1.0187E+22	1.9837E+10	3.9700	0.0049	0.0000
I-138	6.4600	s	0.93	6.6465E+21	1.9274E+10	1.8900	2.5900	0.0000
Mo-103	1.1320	m	0.88	6.8454E+22	1.8881E+10	0.0000	0.0000	0.0000
Se-86	15.3000	s	5.88	1.4176E+22	1.7358E+10	2.2690	1.4390	0.0000
Nb-102	1.3000	s	15.38	1.1267E+21	1.6236E+10	0.0000	0.0000	0.0000
Zr-99	2.2000	s	4.55	1.8919E+21	1.6110E+10	0.8600	1.5500	0.0000
Te-136	17.5000	s	1.14	1.4861E+22	1.5909E+10	2.1700	1.2200	0.0000
Pr-150	6.1000	s	6.56	4.2992E+21	1.3203E+10	0.5558	1.8950	0.0000
Mo-104	1.0000	m	3.33	4.2280E+22	1.3201E+10	0.1470	0.6850	0.0000
Ce-147	57.0000	s	3.51	3.9826E+22	1.3089E+10	0.2004	1.4990	0.0000
Br-87	55.7000	s	0.36	3.8122E+22	1.2822E+10	3.1060	1.6790	0.0000
Br-89	4.3700	s	1.14	2.9888E+21	1.2813E+10	1.5880	2.5100	0.0000
Mo-105	35.6000	s	4.49	2.3754E+22	1.2500E+10	0.5511	1.9000	0.0000
Se-85	31.7000	s	2.84	2.0230E+22	1.1955E+10	2.0540	1.9310	0.0000
La-147	4.0150	s	0.20	2.3930E+21	1.1165E+10	0.1836	2.0380	0.0000
I-136	1.3900	m	1.20	4.7441E+22	1.0656E+10	2.4600	1.9700	0.0000
I-136m	46.9000	s	2.13	2.6279E+22	1.0497E+10	2.1360	2.1900	0.0000
Ce-148	56.0000	s	1.79	3.1296E+22	1.0470E+10	0.3180	0.6330	0.0000
Ce-149	5.3000	s	3.77	2.9541E+21	1.0442E+10	0.0000	0.0000	0.0000
Mo-106	8.7300	s	1.38	4.6285E+21	9.9323E+09	0.0000	0.0000	0.0000
La-146m	10.0000	s	1.00	5.2124E+21	9.7647E+09	1.3100	0.9883	0.0000
Zr-102	2.9000	s	6.90	1.3952E+21	9.0125E+09	0.2374	1.9850	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 1080
Total activity (Ci) = 1.86567E+12

Total number of decays = 3.00414E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 18.517
Average chain length = 3.5476

Average gamma E (MeV) = 0.91766
Average beta E (MeV) = 1.5711
Average alpha E (MeV) = 1.76889E-24

Composite Exposure Rate Conversion Factor = 16.1839256 R/hr per Ci/m2
Composite ECF per FGR table = 1.65833795 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.4707041 Rem/hr per Ci/m2

Fission Product Source

Point in time = 19.1409130 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-100	1.5000 s 13.33	5.5351E+21	6.9128E+10	0.7117	2.5460	0.0000	0.0000
Nb-101	7.1000 s 4.23	2.3991E+22	6.3301E+10	0.2700	1.8320	0.0000	0.0000
Nb-98	2.8600 s 2.10	8.9321E+21	5.8508E+10	0.5110	1.7770	0.0000	0.0000
Ba-143	14.500 s 2.07	4.5168E+22	5.8357E+10	0.2310	1.7200	0.0000	0.0000
Zr-100	7.1000 s 5.63	2.0684E+22	5.4575E+10	0.2589	1.3410	0.0000	0.0000
Zr-98	30.700 s 1.30	8.8988E+22	5.4302E+10	0.0019	0.9070	0.0000	0.0000
Sr-95	23.900 s 0.59	6.7958E+22	5.3268E+10	1.0200	2.3000	0.0000	0.0000
Nb-99	15.000 s 1.33	4.2155E+22	5.2648E+10	0.1680	1.4530	0.0000	0.0000
Cs-141	24.940 s 0.24	5.9813E+22	4.4929E+10	1.0100	1.8800	0.0000	0.0000
Ba-144	11.500 s 1.74	2.4925E+22	4.0603E+10	0.4690	0.8533	0.0000	0.0000
La-145	24.800 s 8.06	5.2825E+22	3.9904E+10	0.6430	1.4800	0.0000	0.0000
Kr-90	32.320 s 0.28	6.8393E+22	3.9643E+10	1.3230	1.3600	0.0000	0.0000
Y-96	5.3400 s 0.94	1.1120E+22	3.9009E+10	0.0010	0.1490	0.0000	0.0000
Xe-140	13.600 s 0.74	2.4383E+22	3.3587E+10	1.1500	1.2200	0.0000	0.0000
La-144	40.800 s 0.98	7.2430E+22	3.3257E+10	2.1700	1.6100	0.0000	0.0000
Xe-139	39.680 s 0.35	6.9691E+22	3.2902E+10	0.8940	1.7800	0.0000	0.0000
Kr-91	8.5700 s 0.47	1.4714E+22	3.2165E+10	1.7310	2.0880	0.0000	0.0000
Te-135	19.000 s 1.05	3.2489E+22	3.2034E+10	0.3843	2.4090	0.0000	0.0000
Rb-93	5.8000 s 0.69	8.9001E+21	2.8747E+10	1.4200	2.7100	0.0000	0.0000
I-137	24.510 s 0.24	3.6465E+22	2.7871E+10	1.1400	1.9600	0.0000	0.0000
Sr-94	1.2550 m 0.53	1.0677E+23	2.6563E+10	1.4270	0.8350	0.0000	0.0000
Rb-91	58.400 s 0.68	8.2506E+22	2.6467E+10	2.3400	1.5800	0.0000	0.0000
Cs-140	1.0620 m 0.47	8.9232E+22	2.6234E+10	2.2600	1.7500	0.0000	0.0000
Rb-92	4.4920 s 0.45	6.1861E+21	2.5799E+10	1.3995	2.9000	0.0000	0.0000
Br-88	16.500 s 0.61	2.1656E+22	2.4587E+10	0.2244	0.0000	0.0000	0.0000
La-146	6.2700 s 1.59	6.8174E+21	2.0369E+10	1.4900	2.1600	0.0000	0.0000
Mo-103	1.1320 m 0.88	6.5932E+22	1.8185E+10	0.0000	0.0000	0.0000	0.0000
Y-96m	9.6200 s 1.56	7.7386E+21	1.5070E+10	3.9700	0.0049	0.0000	0.0000
Se-86	15.300 s 5.88	1.1926E+22	1.4603E+10	2.2690	1.4390	0.0000	0.0000
Te-136	17.500 s 1.14	1.2777E+22	1.3678E+10	2.1700	1.2200	0.0000	0.0000
Ce-147	57.000 s 3.51	3.9146E+22	1.2866E+10	0.2004	1.4990	0.0000	0.0000
Mo-104	1.0000 m 3.33	4.1166E+22	1.2853E+10	0.1470	0.6850	0.0000	0.0000
I-138	6.4600 s 0.93	4.4149E+21	1.2803E+10	1.8900	2.5900	0.0000	0.0000
Y-97	3.7500 s 0.80	2.5428E+21	1.2703E+10	1.8300	2.1600	0.0000	0.0000
Br-87	55.700 s 0.36	3.7177E+22	1.2504E+10	3.1060	1.6790	0.0000	0.0000
Mo-105	35.600 s 4.49	2.2193E+22	1.1679E+10	0.5511	1.9000	0.0000	0.0000
Ba-145	4.3100 s 3.71	2.5823E+21	1.1224E+10	0.3100	2.0200	0.0000	0.0000
Se-85	31.700 s 2.84	1.8626E+22	1.1008E+10	2.0540	1.9310	0.0000	0.0000
I-136	1.3900 m 1.20	4.8012E+22	1.0785E+10	2.4600	1.9700	0.0000	0.0000
Ce-148	56.000 s 1.79	2.9859E+22	9.9887E+09	0.3180	0.6330	0.0000	0.0000
I-136m	46.900 s 2.13	2.4839E+22	9.9217E+09	2.1360	2.1900	0.0000	0.0000
Pr-150	6.1000 s 6.56	3.0998E+21	9.5197E+09	0.5558	1.8950	0.0000	0.0000
Kr-89	3.1500 m 1.27	8.2086E+22	8.1364E+09	1.8460	1.3780	0.0000	0.0000
Xe-137	3.8180 m 0.34	9.5986E+22	7.8496E+09	0.1960	1.7030	0.0000	0.0000
Br-86	55.000 s 1.46	2.2273E+22	7.5866E+09	3.3060	1.9440	0.0000	0.0000
La-146m	10.000 s 1.00	4.0013E+21	7.4959E+09	1.3100	0.9883	0.0000	0.0000
Mo-106	8.7300 s 1.38	3.4190E+21	7.3369E+09	0.0000	0.0000	0.0000	0.0000
Br-89	4.3700 s 1.14	1.6320E+21	6.9962E+09	1.5880	2.5100	0.0000	0.0000
Nb-102	1.3000 s 15.38	4.5458E+20	6.5507E+09	0.0000	0.0000	0.0000	0.0000
Ce-149	5.3000 s 3.77	1.7938E+21	6.3406E+09	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1074
Total activity (Ci) = 1.48771E+12

Total number of decays = 3.23885E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 19.964
Average chain length = 3.5476

Average gamma E (MeV) = 0.94344
Average beta E (MeV) = 1.5406
Average alpha E (MeV) = 2.21828E-24

Composite Exposure Rate Conversion Factor = 16.6065426 R/hr per Ci/m2
Composite ECF per FGR table = 1.99250627 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.7929773 Rem/hr per Ci/m2

Fission Product Source

Point in time = 23.9051113 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-98	2.8600 s	2.10	8.1448E+21	5.3351E+10	0.5110	1.7770	0.0000
Zr-98	30.700 s	1.30	7.9943E+22	4.8783E+10	0.0019	0.9070	0.0000
Ba-143	14.500 s	2.07	3.5982E+22	4.6488E+10	0.2310	1.7200	0.0000
Sr-95	23.900 s	0.59	5.9188E+22	4.6394E+10	1.0200	2.3000	0.0000
Nb-100	1.5000 s	13.33	3.4791E+21	4.3450E+10	0.7117	2.5460	0.0000
Nb-99	15.000 s	1.33	3.4098E+22	4.2585E+10	0.1680	1.4530	0.0000
Nb-101	7.1000 s	4.23	1.5226E+22	4.0175E+10	0.2700	1.8320	0.0000
Cs-141	24.940 s	0.24	5.2404E+22	3.9363E+10	1.0100	1.8800	0.0000
La-145	24.800 s	8.06	4.7522E+22	3.5898E+10	0.6430	1.4800	0.0000
Kr-90	32.320 s	0.28	6.1760E+22	3.5798E+10	1.3230	1.3600	0.0000
Zr-100	7.1000 s	5.63	1.2991E+22	3.4276E+10	0.2589	1.3410	0.0000
La-144	40.800 s	0.98	7.2763E+22	3.3410E+10	2.1700	1.6100	0.0000
Ba-144	11.500 s	1.74	1.8704E+22	3.0469E+10	0.4690	0.8533	0.0000
Xe-139	39.680 s	0.35	6.4153E+22	3.0288E+10	0.8940	1.7800	0.0000
Te-135	19.000 s	1.05	2.7308E+22	2.6925E+10	0.3843	2.4090	0.0000
Rb-91	58.400 s	0.68	8.2537E+22	2.6476E+10	2.3400	1.5800	0.0000
Cs-140	1.0620 m	0.47	8.9843E+22	2.6414E+10	2.2600	1.7500	0.0000
Xe-140	13.600 s	0.74	1.9126E+22	2.6346E+10	1.1500	1.2200	0.0000
Sr-94	1.2550 m	0.53	1.0240E+23	2.5476E+10	1.4270	0.8350	0.0000
I-137	24.510 s	0.24	3.1887E+22	2.4372E+10	1.1400	1.9600	0.0000
Kr-91	8.5700 s	0.47	1.0009E+22	2.1879E+10	1.7310	2.0880	0.0000
Y-96	5.3400 s	0.94	5.9915E+21	2.1019E+10	0.0010	0.1490	0.0000
Br-88	16.500 s	0.61	1.7729E+22	2.0129E+10	0.2244	0.0000	0.0000
Mo-103	1.1320 m	0.88	6.2821E+22	1.7327E+10	0.0000	0.0000	0.0000
Rb-93	5.8000 s	0.69	5.0366E+21	1.6268E+10	1.4200	2.7100	0.0000
Rb-92	4.4920 s	0.45	2.9792E+21	1.2424E+10	1.3995	2.9000	0.0000
Ce-147	57.000 s	3.51	3.7615E+22	1.2363E+10	0.2004	1.4990	0.0000
Mo-104	1.0000 m	3.33	3.9443E+22	1.2315E+10	0.1470	0.6850	0.0000
La-146	6.2700 s	1.59	4.0654E+21	1.2147E+10	1.4900	2.1600	0.0000
Br-87	55.700 s	0.36	3.5622E+22	1.1981E+10	3.1060	1.6790	0.0000
Se-86	15.300 s	5.88	9.6111E+21	1.1768E+10	2.2690	1.4390	0.0000
Te-136	17.500 s	1.14	1.0580E+22	1.1326E+10	2.1700	1.2200	0.0000
I-136	1.3900 m	1.20	4.8301E+22	1.0850E+10	2.4600	1.9700	0.0000
Y-96m	9.6200 s	1.56	5.4901E+21	1.0691E+10	3.9700	0.0049	0.0000
Mo-105	35.600 s	4.49	2.0291E+22	1.0678E+10	0.5511	1.9000	0.0000
Se-85	31.700 s	2.84	1.6788E+22	9.9213E+09	2.0540	1.9310	0.0000
Ce-148	56.000 s	1.79	2.8150E+22	9.4170E+09	0.3180	0.6330	0.0000
I-136m	46.900 s	2.13	2.3151E+22	9.2473E+09	2.1360	2.1900	0.0000
Xe-137	3.8180 m	0.34	9.8973E+22	8.0938E+09	0.1960	1.7030	0.0000
Kr-89	3.1500 m	1.27	8.1404E+22	8.0688E+09	1.8460	1.3780	0.0000
Br-86	55.000 s	1.46	2.3220E+22	7.9090E+09	3.3060	1.9440	0.0000
I-138	6.4600 s	0.93	2.6481E+21	7.6795E+09	1.8900	2.5900	0.0000
Pr-150	6.1000 s	6.56	1.9801E+21	6.0812E+09	0.5558	1.8950	0.0000
Nb-99m	2.6000 m	7.69	4.7659E+22	5.7233E+09	0.7550	1.4700	0.0000
La-146m	10.000 s	1.00	2.8760E+21	5.3878E+09	1.3100	0.9883	0.0000
Sr-93	7.4230 m	0.32	1.2651E+23	5.3211E+09	2.2200	0.7870	0.0000
Tc-106	36.000 s	2.78	1.0172E+22	5.2931E+09	2.1870	1.8980	0.0000
Y-97	3.7500 s	0.80	1.0541E+21	5.2657E+09	1.8300	2.1600	0.0000
Ba-145	4.3100 s	3.71	1.2002E+21	5.2168E+09	0.3100	2.0200	0.0000
Mo-106	8.7300 s	1.38	2.3422E+21	5.0261E+09	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 1062
Total activity (Ci) = 1.18482E+12

Total number of decays = 3.47240E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 21.404
Average chain length = 3.5476

Average gamma E (MeV) = 0.97767
Average beta E (MeV) = 1.5084
Average alpha E (MeV) = 2.78537E-24

Composite Exposure Rate Conversion Factor = 17.1737957 R/hr per Ci/m2
Composite ECF per FGR table = 2.32436180 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.2208214 Rem/hr per Ci/m2

Fission Product Source

Point in time = 29.8551559 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-98	2.8600 s	2.10	7.1645E+21	4.6929E+10	0.5110	1.7770	0.0000
Zr-98	30.700 s	1.30	6.9900E+22	4.2654E+10	0.0019	0.9070	0.0000
Sr-95	23.900 s	0.59	4.9807E+22	3.9041E+10	1.0200	2.3000	0.0000
Ba-143	14.500 s	2.07	2.7077E+22	3.4982E+10	0.2310	1.7200	0.0000
Cs-141	24.940 s	0.24	4.4418E+22	3.3365E+10	1.0100	1.8800	0.0000
La-144	40.800 s	0.98	7.1113E+22	3.2652E+10	2.1700	1.6100	0.0000
Nb-99	15.000 s	1.33	2.5983E+22	3.2450E+10	0.1680	1.4530	0.0000
Kr-90	32.320 s	0.28	5.4363E+22	3.1510E+10	1.3230	1.3600	0.0000
La-145	24.800 s	8.06	4.0914E+22	3.0906E+10	0.6430	1.4800	0.0000
Xe-139	39.680 s	0.35	5.7827E+22	2.7301E+10	0.8940	1.7800	0.0000
Cs-140	1.0620 m	0.47	8.9049E+22	2.6180E+10	2.2600	1.7500	0.0000
Rb-91	58.400 s	0.68	8.0590E+22	2.5852E+10	2.3400	1.5800	0.0000
Nb-100	1.5000 s	13.33	1.9465E+21	2.4310E+10	0.7117	2.5460	0.0000
Sr-94	1.2550 m	0.53	9.7011E+22	2.4135E+10	1.4270	0.8350	0.0000
Nb-101	7.1000 s	4.23	8.5556E+21	2.2574E+10	0.2700	1.8320	0.0000
Te-135	19.000 s	1.05	2.1980E+22	2.1672E+10	0.3843	2.4090	0.0000
Ba-144	11.500 s	1.74	1.3067E+22	2.1286E+10	0.4690	0.8533	0.0000
I-137	24.510 s	0.24	2.6954E+22	2.0601E+10	1.1400	1.9600	0.0000
Xe-140	13.600 s	0.74	1.4123E+22	1.9454E+10	1.1500	1.2200	0.0000
Zr-100	7.1000 s	5.63	7.2670E+21	1.9174E+10	0.2589	1.3410	0.0000
Mo-103	1.1320 m	0.88	5.9122E+22	1.6307E+10	0.0000	0.0000	0.0000
Br-88	16.500 s	0.61	1.3808E+22	1.5678E+10	0.2244	0.0000	0.0000
Kr-91	8.5700 s	0.47	6.1857E+21	1.3522E+10	1.7310	2.0880	0.0000
Ce-147	57.000 s	3.51	3.5324E+22	1.1610E+10	0.2004	1.4990	0.0000
Mo-104	1.0000 m	3.33	3.7106E+22	1.1585E+10	0.1470	0.6850	0.0000
Br-87	55.700 s	0.36	3.3442E+22	1.1248E+10	3.1060	1.6790	0.0000
I-136	1.3900 m	1.20	4.8136E+22	1.0813E+10	2.4600	1.9700	0.0000
Y-96	5.3400 s	0.94	2.7677E+21	9.7095E+09	0.0010	0.1490	0.0000
Mo-105	35.600 s	4.49	1.8094E+22	9.5218E+09	0.5511	1.9000	0.0000
Se-86	15.300 s	5.88	7.3402E+21	8.9875E+09	2.2690	1.4390	0.0000
Te-136	17.500 s	1.14	8.3586E+21	8.9479E+09	2.1700	1.2200	0.0000
Ce-148	56.000 s	1.79	2.6151E+22	8.7485E+09	0.3180	0.6330	0.0000
Se-85	31.700 s	2.84	1.4741E+22	8.7115E+09	2.0540	1.9310	0.0000
I-136m	46.900 s	2.13	2.1202E+22	8.4689E+09	2.1360	2.1900	0.0000
Xe-137	3.8180 m	0.34	1.0185E+23	8.3289E+09	0.1960	1.7030	0.0000
Br-86	55.000 s	1.46	2.3727E+22	8.0816E+09	3.3060	1.9440	0.0000
Rb-93	5.8000 s	0.69	2.4736E+21	7.9895E+09	1.4200	2.7100	0.0000
Kr-89	3.1500 m	1.27	8.0045E+22	7.9340E+09	1.8460	1.3780	0.0000
Y-96m	9.6200 s	1.56	3.5760E+21	6.9637E+09	3.9700	0.0049	0.0000
La-146	6.2700 s	1.59	2.1147E+21	6.3184E+09	1.4900	2.1600	0.0000
Tc-103	54.200 s	1.48	1.6321E+22	5.6413E+09	0.2486	0.9830	0.0000
Nb-99m	2.6000 m	7.69	4.6457E+22	5.5789E+09	0.7550	1.4700	0.0000
Sr-93	7.4230 m	0.32	1.2786E+23	5.3782E+09	2.2200	0.7870	0.0000
Tc-106	36.000 s	2.78	9.9001E+21	5.1518E+09	2.1870	1.8980	0.0000
Rb-92	4.4920 s	0.45	1.1915E+21	4.9693E+09	1.3995	2.9000	0.0000
Rb-90	2.6330 m	3.17	4.1284E+22	4.8956E+09	1.8500	1.9800	0.0000
Sb-133	2.5000 m	4.00	3.5821E+22	4.4738E+09	4.3440	0.0000	0.0000
Ce-145	2.9500 m	2.03	4.1961E+22	4.4411E+09	0.7740	0.6910	0.0000
Sb-132	2.7900 m	1.79	3.7006E+22	4.1413E+09	2.6100	1.2400	0.0000
I-138	6.4600 s	0.93	1.3985E+21	4.0557E+09	1.8900	2.5900	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1046
Total activity (Ci) = 9.45019E+11

Total number of decays = 3.70482E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 22.836
Average chain length = 3.5476

Average gamma E (MeV) = 1.0192
Average beta E (MeV) = 1.4766
Average alpha E (MeV) = 3.49216E-24

Composite Exposure Rate Conversion Factor = 17.8655224 R/hr per Ci/m2
Composite ECF per FGR table = 2.63217330 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.7402811 Rem/hr per Ci/m2

Fission Product Source

Point in time = 37.2861481 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-98	2.8600 s	2.10	6.0690E+21	3.9754E+10	0.5110	1.7770	0.0000
Zr-98	30.700 s	1.30	5.9104E+22	3.6067E+10	0.0019	0.9070	0.0000
Sr-95	23.900 s	0.59	4.0151E+22	3.1472E+10	1.0200	2.3000	0.0000
La-144	40.800 s	0.98	6.7090E+22	3.0805E+10	2.1700	1.6100	0.0000
Cs-141	24.940 s	0.24	3.6130E+22	2.7139E+10	1.0100	1.8800	0.0000
Kr-90	32.320 s	0.28	4.6354E+22	2.6869E+10	1.3230	1.3600	0.0000
Cs-140	1.0620 m	0.47	8.6401E+22	2.5402E+10	2.2600	1.7500	0.0000
La-145	24.800 s	8.06	3.3525E+22	2.5325E+10	0.6430	1.4800	0.0000
Rb-91	58.400 s	0.68	7.6449E+22	2.4524E+10	2.3400	1.5800	0.0000
Ba-143	14.500 s	2.07	1.8981E+22	2.4523E+10	0.2310	1.7200	0.0000
Xe-139	39.680 s	0.35	5.0789E+22	2.3978E+10	0.8940	1.7800	0.0000
Nb-99	15.000 s	1.33	1.8466E+22	2.3063E+10	0.1680	1.4530	0.0000
Sr-94	1.2550 m	0.53	9.0614E+22	2.2544E+10	1.4270	0.8350	0.0000
I-137	24.510 s	0.24	2.1846E+22	1.6698E+10	1.1400	1.9600	0.0000
Te-135	19.000 s	1.05	1.6761E+22	1.6526E+10	0.3843	2.4090	0.0000
Mo-103	1.1320 m	0.88	5.4805E+22	1.5116E+10	0.0000	0.0000	0.0000
Ba-144	11.500 s	1.74	8.3495E+21	1.3601E+10	0.4690	0.8533	0.0000
Xe-140	13.600 s	0.74	9.6705E+21	1.3321E+10	1.1500	1.2200	0.0000
Nb-100	1.5000 s	13.33	9.4231E+20	1.1769E+10	0.7117	2.5460	0.0000
Br-88	16.500 s	0.61	1.0106E+22	1.1474E+10	0.2244	0.0000	0.0000
Nb-101	7.1000 s	4.23	4.1479E+21	1.0944E+10	0.2700	1.8320	0.0000
Mo-104	1.0000 m	3.33	3.4191E+22	1.0675E+10	0.1470	0.6850	0.0000
Ce-147	57.000 s	3.51	3.2405E+22	1.0650E+10	0.2004	1.4990	0.0000
I-136	1.3900 m	1.20	4.7317E+22	1.0628E+10	2.4600	1.9700	0.0000
Br-87	55.700 s	0.36	3.0677E+22	1.0318E+10	3.1060	1.6790	0.0000
Zr-100	7.1000 s	5.63	3.5180E+21	9.2823E+09	0.2589	1.3410	0.0000
Xe-137	3.8180 m	0.34	1.0435E+23	8.5332E+09	0.1960	1.7030	0.0000
Mo-105	35.600 s	4.49	1.5663E+22	8.2424E+09	0.5511	1.9000	0.0000
Br-86	55.000 s	1.46	2.3603E+22	8.0396E+09	3.3060	1.9440	0.0000
Ce-148	56.000 s	1.79	2.3853E+22	7.9797E+09	0.3180	0.6330	0.0000
Kr-89	3.1500 m	1.27	7.8067E+22	7.7380E+09	1.8460	1.3780	0.0000
I-136m	46.900 s	2.13	1.8997E+22	7.5880E+09	2.1360	2.1900	0.0000
Kr-91	8.5700 s	0.47	3.3913E+21	7.4133E+09	1.7310	2.0880	0.0000
Se-85	31.700 s	2.84	1.2531E+22	7.4051E+09	2.0540	1.9310	0.0000
Te-136	17.500 s	1.14	6.2274E+21	6.6664E+09	2.1700	1.2200	0.0000
Tc-103	54.200 s	1.48	1.8958E+22	6.5527E+09	0.2486	0.9830	0.0000
Se-86	15.300 s	5.88	5.2420E+21	6.4185E+09	2.2690	1.4390	0.0000
Rb-90	2.6330 m	3.17	4.6816E+22	5.5516E+09	1.8500	1.9800	0.0000
Nb-99m	2.6000 m	7.69	4.4955E+22	5.3985E+09	0.7550	1.4700	0.0000
Sr-93	7.4230 m	0.32	1.2782E+23	5.3764E+09	2.2200	0.7870	0.0000
Ce-145	2.9500 m	2.03	4.8353E+22	5.1177E+09	0.7740	0.6910	0.0000
Tc-106	36.000 s	2.78	9.1825E+21	4.7784E+09	2.1870	1.8980	0.0000
Sb-133	2.5000 m	4.00	3.4612E+22	4.3228E+09	4.3440	0.0000	0.0000
Sb-132	2.7900 m	1.79	3.6574E+22	4.0929E+09	2.6100	1.2400	0.0000
Y-96m	9.6200 s	1.56	2.0935E+21	4.0767E+09	3.9700	0.0049	0.0000
Y-96	5.3400 s	0.94	1.0549E+21	3.7008E+09	0.0010	0.1490	0.0000
Sn-131	56.000 s	0.89	1.0710E+22	3.5829E+09	0.0000	0.0000	0.0000
Ba-142	10.600 m	1.89	1.1897E+23	3.5042E+09	1.0400	0.3780	0.0000
Sn-131m	58.400 s	0.86	1.0415E+22	3.3408E+09	0.0000	0.0000	0.0000
Rb-93	5.8000 s	0.69	1.0178E+21	3.2873E+09	1.4200	2.7100	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 1041
Total activity (Ci) = 7.56357E+11

Total number of decays = 3.93672E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 24.266
Average chain length = 3.5476

Average gamma E (MeV) = 1.0653
Average beta E (MeV) = 1.4466
Average alpha E (MeV) = 4.36323E-24

Composite Exposure Rate Conversion Factor = 18.6319237 R/hr per Ci/m2
Composite ECF per FGR table = 2.89166880 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.3160667 Rem/hr per Ci/m2

Fission Product Source

Point in time = 46.5667229 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-98	2.8600 s 2.10	4.9237E+21	3.2251E+10	0.5110	1.7770	0.0000	0.0000
Zr-98	30.700 s 1.30	4.7931E+22	2.9249E+10	0.0019	0.9070	0.0000	0.0000
La-144	40.800 s 0.98	6.0589E+22	2.7820E+10	2.1700	1.6100	0.0000	0.0000
Sr-95	23.900 s 0.59	3.0676E+22	2.4045E+10	1.0200	2.3000	0.0000	0.0000
Cs-140	1.0620 m 0.47	8.1557E+22	2.3978E+10	2.2600	1.7500	0.0000	0.0000
Rb-91	58.400 s 0.68	7.0159E+22	2.2506E+10	2.3400	1.5800	0.0000	0.0000
Kr-90	32.320 s 0.28	3.7988E+22	2.2019E+10	1.3230	1.3600	0.0000	0.0000
Cs-141	24.940 s 0.24	2.7916E+22	2.0969E+10	1.0100	1.8800	0.0000	0.0000
Sr-94	1.2550 m 0.53	8.3196E+22	2.0698E+10	1.4270	0.8350	0.0000	0.0000
Xe-139	39.680 s 0.35	4.3188E+22	2.0390E+10	0.8940	1.7800	0.0000	0.0000
La-145	24.800 s 8.06	2.5958E+22	1.9608E+10	0.6430	1.4800	0.0000	0.0000
Ba-143	14.500 s 2.07	1.2180E+22	1.5737E+10	0.2310	1.7200	0.0000	0.0000
Nb-99	15.000 s 1.33	1.2057E+22	1.5058E+10	0.1680	1.4530	0.0000	0.0000
Mo-103	1.1320 m 0.88	4.9852E+22	1.3750E+10	0.0000	0.0000	0.0000	0.0000
I-137	24.510 s 0.24	1.6803E+22	1.2843E+10	1.1400	1.9600	0.0000	0.0000
Te-135	19.000 s 1.05	1.1947E+22	1.1779E+10	0.3843	2.4090	0.0000	0.0000
I-136	1.3900 m 1.20	4.5643E+22	1.0253E+10	2.4600	1.9700	0.0000	0.0000
Mo-104	1.0000 m 3.33	3.0768E+22	9.6066E+09	0.1470	0.6850	0.0000	0.0000
Ce-147	57.000 s 3.51	2.8987E+22	9.5270E+09	0.2004	1.4990	0.0000	0.0000
Br-87	55.700 s 0.36	2.7410E+22	9.2190E+09	3.1060	1.6790	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.0612E+23	8.6786E+09	0.1960	1.7030	0.0000	0.0000
Xe-140	13.600 s 0.74	6.0260E+21	8.3006E+09	1.1500	1.2200	0.0000	0.0000
Ba-144	11.500 s 1.74	4.7723E+21	7.7741E+09	0.4690	0.8533	0.0000	0.0000
Br-88	16.500 s 0.61	6.8430E+21	7.7694E+09	0.2244	0.0000	0.0000	0.0000
Br-86	55.000 s 1.46	2.2689E+22	7.7282E+09	3.3060	1.9440	0.0000	0.0000
Kr-89	3.1500 m 1.27	7.5514E+22	7.4850E+09	1.8460	1.3780	0.0000	0.0000
Tc-103	54.200 s 1.48	2.1502E+22	7.4320E+09	0.2486	0.9830	0.0000	0.0000
Ce-148	56.000 s 1.79	2.1265E+22	7.1137E+09	0.3180	0.6330	0.0000	0.0000
Mo-105	35.600 s 4.49	1.3075E+22	6.8804E+09	0.5511	1.9000	0.0000	0.0000
I-136m	46.900 s 2.13	1.6562E+22	6.6155E+09	2.1360	2.1900	0.0000	0.0000
Rb-90	2.6330 m 3.17	5.2083E+22	6.1761E+09	1.8500	1.9800	0.0000	0.0000
Se-85	31.700 s 2.84	1.0229E+22	6.0451E+09	2.0540	1.9310	0.0000	0.0000
Ce-145	2.9500 m 2.03	5.4159E+22	5.7322E+09	0.7740	0.6910	0.0000	0.0000
Sr-93	7.4230 m 0.32	1.2665E+23	5.3274E+09	2.2200	0.7870	0.0000	0.0000
Nb-99m	2.6000 m 7.69	4.3139E+22	5.1805E+09	0.7550	1.4700	0.0000	0.0000
Nb-100	1.5000 s 13.33	3.8081E+20	4.7560E+09	0.7117	2.5460	0.0000	0.0000
Te-136	17.500 s 1.14	4.3119E+21	4.6158E+09	2.1700	1.2200	0.0000	0.0000
Nb-101	7.1000 s 4.23	1.6768E+21	4.4244E+09	0.2700	1.8320	0.0000	0.0000
Se-86	15.300 s 5.88	3.4427E+21	4.2154E+09	2.2690	1.4390	0.0000	0.0000
Tc-106	36.000 s 2.78	8.0622E+21	4.1954E+09	2.1870	1.8980	0.0000	0.0000
Sb-133	2.5000 m 4.00	3.3159E+22	4.1413E+09	4.3440	0.0000	0.0000	0.0000
Sb-132	2.7900 m 1.79	3.5936E+22	4.0216E+09	2.6100	1.2400	0.0000	0.0000
Zr-100	7.1000 s 5.63	1.4217E+21	3.7512E+09	0.2589	1.3410	0.0000	0.0000
Kr-91	8.5700 s 0.47	1.6010E+21	3.4996E+09	1.7310	2.0880	0.0000	0.0000
Ba-142	10.600 m 1.89	1.1777E+23	3.4690E+09	1.0400	0.3780	0.0000	0.0000
Y-95	10.300 m 0.97	1.0929E+23	3.3129E+09	1.2910	1.3520	0.0000	0.0000
Sn-131	56.000 s 0.89	9.5479E+21	3.1941E+09	0.0000	0.0000	0.0000	0.0000
Cs-139	9.2700 m 0.54	9.4733E+22	3.1908E+09	0.3290	1.6500	0.0000	0.0000
Sn-131m	58.400 s 0.86	9.3284E+21	2.9924E+09	0.0000	0.0000	0.0000	0.0000
Xe-138	14.080 m 0.57	1.3069E+23	2.8982E+09	1.1300	0.6390	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 1030
Total activity (Ci) = 6.07146E+11

Total number of decays = 4.16891E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 25.697
Average chain length = 3.5476

Average gamma E (MeV) = 1.1121
Average beta E (MeV) = 1.4184
Average alpha E (MeV) = 5.43553E-24

Composite Exposure Rate Conversion Factor = 19.4064293 R/hr per Ci/m2
Composite ECF per FGR table = 3.08292317 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.9012403 Rem/hr per Ci/m2

Fission Product Source

Point in time = 58.1572990 sec

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Nb-98	2.8600 s	2.10	3.7902E+21	2.4827E+10	0.5110	1.7770	0.0000
La-144	40.800 s	0.98	5.1913E+22	2.3836E+10	2.1700	1.6100	0.0000
Zr-98	30.700 s	1.30	3.6895E+22	2.2514E+10	0.0019	0.9070	0.0000
Cs-140	1.0620 m	0.47	7.4406E+22	2.1875E+10	2.2600	1.7500	0.0000
Rb-91	58.400 s	0.68	6.2043E+22	1.9902E+10	2.3400	1.5800	0.0000
Sr-94	1.2550 m	0.53	7.4777E+22	1.8604E+10	1.4270	0.8350	0.0000
Sr-95	23.900 s	0.59	2.1919E+22	1.7181E+10	1.0200	2.3000	0.0000
Kr-90	32.320 s	0.28	2.9628E+22	1.7173E+10	1.3230	1.3600	0.0000
Xe-139	39.680 s	0.35	3.5272E+22	1.6653E+10	0.8940	1.7800	0.0000
Cs-141	24.940 s	0.24	2.0228E+22	1.5194E+10	1.0100	1.8800	0.0000
La-145	24.800 s	8.06	1.8796E+22	1.4199E+10	0.6430	1.4800	0.0000
Mo-103	1.1320 m	0.88	4.4291E+22	1.2216E+10	0.0000	0.0000	0.0000
I-136	1.3900 m	1.20	4.2959E+22	9.6497E+09	2.4600	1.9700	0.0000
I-137	24.510 s	0.24	1.2107E+22	9.2538E+09	1.1400	1.9600	0.0000
Ba-143	14.500 s	2.07	6.9989E+21	9.0424E+09	0.2310	1.7200	0.0000
Nb-99	15.000 s	1.33	7.0905E+21	8.8554E+09	0.1680	1.4530	0.0000
Xe-137	3.8180 m	0.34	1.0679E+23	8.7327E+09	0.1960	1.7030	0.0000
Mo-104	1.0000 m	3.33	2.6927E+22	8.4075E+09	0.1470	0.6850	0.0000
Ce-147	57.000 s	3.51	2.5185E+22	8.2774E+09	0.2004	1.4990	0.0000
Tc-103	54.200 s	1.48	2.3701E+22	8.1921E+09	0.2486	0.9830	0.0000
Br-87	55.700 s	0.36	2.3754E+22	7.9894E+09	3.1060	1.6790	0.0000
Te-135	19.000 s	1.05	7.8274E+21	7.7177E+09	0.3843	2.4090	0.0000
Kr-89	3.1500 m	1.27	7.2386E+22	7.1750E+09	1.8460	1.3780	0.0000
Br-86	55.000 s	1.46	2.0906E+22	7.1207E+09	3.3060	1.9440	0.0000
Rb-90	2.6330 m	3.17	5.6595E+22	6.7112E+09	1.8500	1.9800	0.0000
Ce-145	2.9500 m	2.03	5.8774E+22	6.2207E+09	0.7740	0.6910	0.0000
Ce-148	56.000 s	1.79	1.8423E+22	6.1630E+09	0.3180	0.6330	0.0000
I-136m	46.900 s	2.13	1.3955E+22	5.5740E+09	2.1360	2.1900	0.0000
Mo-105	35.600 s	4.49	1.0434E+22	5.4905E+09	0.5511	1.9000	0.0000
Sr-93	7.4230 m	0.32	1.2464E+23	5.2425E+09	2.2200	0.7870	0.0000
Nb-99m	2.6000 m	7.69	4.0974E+22	4.9205E+09	0.7550	1.4700	0.0000
Br-88	16.500 s	0.61	4.2052E+21	4.7745E+09	0.2244	0.0000	0.0000
Se-85	31.700 s	2.84	7.9391E+21	4.6918E+09	2.0540	1.9310	0.0000
Xe-140	13.600 s	0.74	3.3379E+21	4.5979E+09	1.1500	1.2200	0.0000
Sb-133	2.5000 m	4.00	3.1430E+22	3.9253E+09	4.3440	0.0000	0.0000
Sb-132	2.7900 m	1.79	3.5020E+22	3.9190E+09	2.6100	1.2400	0.0000
Ba-144	11.500 s	1.74	2.3731E+21	3.8659E+09	0.4690	0.8533	0.0000
Y-95	10.300 m	0.97	1.1658E+23	3.5338E+09	1.2910	1.3520	0.0000
Tc-106	36.000 s	2.78	6.6550E+21	3.4632E+09	2.1870	1.8980	0.0000
Ba-142	10.600 m	1.89	1.1629E+23	3.4254E+09	1.0400	0.3780	0.0000
Cs-139	9.2700 m	0.54	1.0123E+23	3.4097E+09	0.3290	1.6500	0.0000
Te-136	17.500 s	1.14	2.7245E+21	2.9166E+09	2.1700	1.2200	0.0000
Xe-138	14.080 m	0.57	1.2961E+23	2.8742E+09	1.1300	0.6390	0.0000
Sn-131	56.000 s	0.89	8.2719E+21	2.7672E+09	0.0000	0.0000	0.0000
Tc-102	5.2800 s	2.84	7.5929E+20	2.6940E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	9.6876E+22	2.6768E+09	0.0189	0.3510	0.0000
Sn-131m	58.400 s	0.86	8.1294E+21	2.6078E+09	0.0000	0.0000	0.0000
Pr-149	2.2600 m	3.10	1.8865E+22	2.6063E+09	0.1800	0.9439	0.0000
La-143	14.140 m	1.13	1.1610E+23	2.5636E+09	0.2515	1.5000	0.0000
Se-86	15.300 s	5.88	2.0364E+21	2.4934E+09	2.2690	1.4390	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 1004
Total activity (Ci) = 4.87177E+11

Total number of decays = 4.40172E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 27.132
Average chain length = 3.5476

Average gamma E (MeV) = 1.1561
Average beta E (MeV) = 1.3899
Average alpha E (MeV) = 6.77405E-24

Composite Exposure Rate Conversion Factor = 20.1251049 R/hr per Ci/m2
Composite ECF per FGR table = 3.20044994 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.4506788 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.21054566 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
La-144	40.800 s 0.98	4.1798E+22	1.9192E+10	2.1700	1.6100	0.0000	0.0000
Cs-140	1.0620 m 0.47	6.5161E+22	1.9157E+10	2.2600	1.7500	0.0000	0.0000
Nb-98	2.8600 s 2.10	2.7335E+21	1.7905E+10	0.5110	1.7770	0.0000	0.0000
Rb-91	58.400 s 0.68	5.2639E+22	1.6886E+10	2.3400	1.5800	0.0000	0.0000
Sr-94	1.2550 m 0.53	6.5449E+22	1.6283E+10	1.4270	0.8350	0.0000	0.0000
Zr-98	30.700 s 1.30	2.6609E+22	1.6237E+10	0.0019	0.9070	0.0000	0.0000
Xe-139	39.680 s 0.35	2.7392E+22	1.2932E+10	0.8940	1.7800	0.0000	0.0000
Kr-90	32.320 s 0.28	2.1721E+22	1.2590E+10	1.3230	1.3600	0.0000	0.0000
Sr-95	23.900 s 0.59	1.4404E+22	1.1291E+10	1.0200	2.3000	0.0000	0.0000
Mo-103	1.1320 m 0.88	3.8208E+22	1.0539E+10	0.0000	0.0000	0.0000	0.0000
Cs-141	24.940 s 0.24	1.3528E+22	1.0161E+10	1.0100	1.8800	0.0000	0.0000
La-145	24.800 s 8.06	1.2545E+22	9.4767E+09	0.6430	1.4800	0.0000	0.0000
I-136	1.3900 m 1.20	3.9204E+22	8.8061E+09	2.4600	1.9700	0.0000	0.0000
Tc-103	54.200 s 1.48	2.5236E+22	8.7225E+09	0.2486	0.9830	0.0000	0.0000
Xe-137	3.8180 m 0.34	1.0593E+23	8.6625E+09	0.1960	1.7030	0.0000	0.0000
Mo-104	1.0000 m 3.33	2.2784E+22	7.1138E+09	0.1470	0.6850	0.0000	0.0000
Rb-90	2.6330 m 3.17	5.9782E+22	7.0892E+09	1.8500	1.9800	0.0000	0.0000
Ce-147	57.000 s 3.51	2.1121E+22	6.9418E+09	0.2004	1.4990	0.0000	0.0000
Kr-89	3.1500 m 1.27	6.8646E+22	6.8042E+09	1.8460	1.3780	0.0000	0.0000
Br-87	55.700 s 0.36	1.9845E+22	6.6744E+09	3.1060	1.6790	0.0000	0.0000
Ce-145	2.9500 m 2.03	6.1605E+22	6.5203E+09	0.7740	0.6910	0.0000	0.0000
Br-86	55.000 s 1.46	1.8306E+22	6.2352E+09	3.3060	1.9440	0.0000	0.0000
I-137	24.510 s 0.24	8.0399E+21	6.1451E+09	1.1400	1.9600	0.0000	0.0000
Ce-148	56.000 s 1.79	1.5401E+22	5.1520E+09	0.3180	0.6330	0.0000	0.0000
Sr-93	7.4230 m 0.32	1.2193E+23	5.1285E+09	2.2200	0.7870	0.0000	0.0000
Nb-99m	2.6000 m 7.69	3.8421E+22	4.6140E+09	0.7550	1.4700	0.0000	0.0000
Nb-99	15.000 s 1.33	3.6693E+21	4.5827E+09	0.1680	1.4530	0.0000	0.0000
Te-135	19.000 s 1.05	4.6161E+21	4.5514E+09	0.3843	2.4090	0.0000	0.0000
Ba-143	14.500 s 2.07	3.5035E+21	4.5265E+09	0.2310	1.7200	0.0000	0.0000
I-136m	46.900 s 2.13	1.1267E+22	4.5004E+09	2.1360	2.1900	0.0000	0.0000
Mo-105	35.600 s 4.49	7.8711E+21	4.1420E+09	0.5511	1.9000	0.0000	0.0000
Sb-132	2.7900 m 1.79	3.3742E+22	3.7761E+09	2.6100	1.2400	0.0000	0.0000
Y-95	10.300 m 0.97	1.2215E+23	3.7027E+09	1.2910	1.3520	0.0000	0.0000
Sb-133	2.5000 m 4.00	2.9396E+22	3.6713E+09	4.3440	0.0000	0.0000	0.0000
Cs-139	9.2700 m 0.54	1.0723E+23	3.6117E+09	0.3290	1.6500	0.0000	0.0000
Se-85	31.700 s 2.84	5.7851E+21	3.4188E+09	2.0540	1.9310	0.0000	0.0000
Ba-142	10.600 m 1.89	1.1447E+23	3.3718E+09	1.0400	0.3780	0.0000	0.0000
Xe-138	14.080 m 0.57	1.2813E+23	2.8414E+09	1.1300	0.6390	0.0000	0.0000
Tc-106	36.000 s 2.78	5.1259E+21	2.6674E+09	2.1870	1.8980	0.0000	0.0000
Tc-102	5.2800 s 2.84	7.4904E+20	2.6576E+09	0.0786	1.9400	0.0000	0.0000
Mo-102	11.300 m 1.77	9.5455E+22	2.6375E+09	0.0189	0.3510	0.0000	0.0000
La-143	14.140 m 1.13	1.1820E+23	2.6101E+09	0.2515	1.5000	0.0000	0.0000
Br-88	16.500 s 0.61	2.2893E+21	2.5992E+09	0.2244	0.0000	0.0000	0.0000
Pr-148	2.2900 m 0.87	1.8527E+22	2.5260E+09	0.8870	1.7900	0.0000	0.0000
Pr-149	2.2600 m 3.10	1.7529E+22	2.4216E+09	0.1800	0.9439	0.0000	0.0000
Mo-101	14.610 m 0.21	1.1217E+23	2.3971E+09	1.5100	0.5120	0.0000	0.0000
Br-85	2.9000 m 2.07	2.1784E+22	2.3454E+09	0.0614	1.0410	0.0000	0.0000
Sn-131	56.000 s 0.89	6.9150E+21	2.3133E+09	0.0000	0.0000	0.0000	0.0000
Xe-140	13.600 s 0.74	1.5961E+21	2.1986E+09	1.1500	1.2200	0.0000	0.0000
Sn-131m	58.400 s 0.86	6.8461E+21	2.1961E+09	0.0000	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 995
Total activity (Ci) = 3.89037E+11

Total number of decays = 4.63454E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 28.567
Average chain length = 3.5476

Average gamma E (MeV) = 1.1940
Average beta E (MeV) = 1.3578
Average alpha E (MeV) = 8.48291E-24

Composite Exposure Rate Conversion Factor = 20.7338428 R/hr per Ci/m2
Composite ECF per FGR table = 3.25911069 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.9244728 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.51185203 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-140	1.0620 m	0.47	5.4388E+22	1.5990E+10	2.2600	1.7500	0.0000
La-144	40.800 s	0.98	3.1296E+22	1.4370E+10	2.1700	1.6100	0.0000
Sr-94	1.2550 m	0.53	5.5415E+22	1.3787E+10	1.4270	0.8350	0.0000
Rb-91	58.400 s	0.68	4.2605E+22	1.3667E+10	2.3400	1.5800	0.0000
Nb-98	2.8600 s	2.10	1.8174E+21	1.1905E+10	0.5110	1.7770	0.0000
Zr-98	30.700 s	1.30	1.7691E+22	1.0796E+10	0.0019	0.9070	0.0000
Xe-139	39.680 s	0.35	1.9974E+22	9.4301E+09	0.8940	1.7800	0.0000
Tc-103	54.200 s	1.48	2.5754E+22	8.9015E+09	0.2486	0.9830	0.0000
Mo-103	1.1320 m	0.88	3.1771E+22	8.7631E+09	0.0000	0.0000	0.0000
Kr-90	32.320 s	0.28	1.4740E+22	8.5436E+09	1.3230	1.3600	0.0000
Xe-137	3.8180 m	0.34	1.0321E+23	8.4403E+09	0.1960	1.7030	0.0000
I-136	1.3900 m	1.20	3.4457E+22	7.7399E+09	2.4600	1.9700	0.0000
Rb-90	2.6330 m	3.17	6.1069E+22	7.2417E+09	1.8500	1.9800	0.0000
Sr-95	23.900 s	0.59	8.5268E+21	6.6836E+09	1.0200	2.3000	0.0000
Ce-145	2.9500 m	2.03	6.2184E+22	6.5816E+09	0.7740	0.6910	0.0000
Kr-89	3.1500 m	1.27	6.4243E+22	6.3678E+09	1.8460	1.3780	0.0000
Cs-141	24.940 s	0.24	8.1850E+21	6.1482E+09	1.0100	1.8800	0.0000
Mo-104	1.0000 m	3.33	1.8490E+22	5.7731E+09	0.1470	0.6850	0.0000
La-145	24.800 s	8.06	7.5694E+21	5.7179E+09	0.6430	1.4800	0.0000
Ce-147	57.000 s	3.51	1.6953E+22	5.5718E+09	0.2004	1.4990	0.0000
Br-87	55.700 s	0.36	1.5848E+22	5.3300E+09	3.1060	1.6790	0.0000
Br-86	55.000 s	1.46	1.5097E+22	5.1421E+09	3.3060	1.9440	0.0000
Sr-93	7.4230 m	0.32	1.1856E+23	4.9868E+09	2.2200	0.7870	0.0000
Nb-99m	2.6000 m	7.69	3.5456E+22	4.2578E+09	0.7550	1.4700	0.0000
Ce-148	56.000 s	1.79	1.2313E+22	4.1191E+09	0.3180	0.6330	0.0000
Y-95	10.300 m	0.97	1.2551E+23	3.8046E+09	1.2910	1.3520	0.0000
Cs-139	9.2700 m	0.54	1.1217E+23	3.7781E+09	0.3290	1.6500	0.0000
I-137	24.510 s	0.24	4.8219E+21	3.6855E+09	1.1400	1.9600	0.0000
Sb-132	2.7900 m	1.79	3.2018E+22	3.5831E+09	2.6100	1.2400	0.0000
I-136m	46.900 s	2.13	8.6252E+21	3.4452E+09	2.1360	2.1900	0.0000
Sb-133	2.5000 m	4.00	2.7040E+22	3.3771E+09	4.3440	0.0000	0.0000
Ba-142	10.600 m	1.89	1.1224E+23	3.3060E+09	1.0400	0.3780	0.0000
Mo-105	35.600 s	4.49	5.5356E+21	2.9130E+09	0.5511	1.9000	0.0000
Xe-138	14.080 m	0.57	1.2626E+23	2.7998E+09	1.1300	0.6390	0.0000
Pr-148	2.2900 m	0.87	1.9858E+22	2.7075E+09	0.8870	1.7900	0.0000
La-143	14.140 m	1.13	1.1848E+23	2.6162E+09	0.2515	1.5000	0.0000
Tc-102	5.2800 s	2.84	7.3546E+20	2.6095E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	9.3707E+22	2.5892E+09	0.0189	0.3510	0.0000
Br-85	2.9000 m	2.07	2.2089E+22	2.3782E+09	0.0614	1.0410	0.0000
Mo-101	14.610 m	0.21	1.1068E+23	2.3654E+09	1.5100	0.5120	0.0000
Te-135	19.000 s	1.05	2.3870E+21	2.3535E+09	0.3843	2.4090	0.0000
Se-85	31.700 s	2.84	3.8961E+21	2.3025E+09	2.0540	1.9310	0.0000
Pr-149	2.2600 m	3.10	1.5983E+22	2.2081E+09	0.1800	0.9439	0.0000
Ba-141	18.270 m	0.38	1.2029E+23	2.0556E+09	0.8470	0.9670	0.0000
Nb-99	15.000 s	1.33	1.6314E+21	2.0374E+09	0.1680	1.4530	0.0000
Sb-132m	4.1000 m	1.71	2.6688E+22	2.0324E+09	2.5900	1.3400	0.0000
Ba-143	14.500 s	2.07	1.4763E+21	1.9074E+09	0.2310	1.7200	0.0000
Tc-106	36.000 s	2.78	3.6493E+21	1.8990E+09	2.1870	1.8980	0.0000
Sn-131	56.000 s	0.89	5.5285E+21	1.8495E+09	0.0000	0.0000	0.0000
Sn-131m	58.400 s	0.86	5.5241E+21	1.7720E+09	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867390D+24

Total number of nuclides = 969
Total activity (Ci) = 3.08291E+11

Total number of decays = 4.86587E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 29.993
Average chain length = 3.5476

Average gamma E (MeV) = 1.2225
Average beta E (MeV) = 1.3205
Average alpha E (MeV) = 1.07047E-23

Composite Exposure Rate Conversion Factor = 21.1808548 R/hr per Ci/m2
Composite ECF per FGR table = 3.29565454 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.2809582 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.88815582 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-140	1.0620 m	0.47	4.2920E+22	1.2618E+10	2.2600	1.7500	0.0000
Sr-94	1.2550 m	0.53	4.5016E+22	1.1199E+10	1.4270	0.8350	0.0000
Rb-91	58.400 s	0.68	3.2622E+22	1.0464E+10	2.3400	1.5800	0.0000
La-144	40.800 s	0.98	2.1523E+22	9.8825E+09	2.1700	1.6100	0.0000
Tc-103	54.200 s	1.48	2.4942E+22	8.6211E+09	0.2486	0.9830	0.0000
Xe-137	3.8180 m	0.34	9.8444E+22	8.0506E+09	0.1960	1.7030	0.0000
Nb-98	2.8600 s	2.10	1.0916E+21	7.1503E+09	0.5110	1.7770	0.0000
Rb-90	2.6330 m	3.17	6.0005E+22	7.1155E+09	1.8500	1.9800	0.0000
Mo-103	1.1320 m	0.88	2.5233E+22	6.9597E+09	0.0000	0.0000	0.0000
I-136	1.3900 m	1.20	2.8960E+22	6.5052E+09	2.4600	1.9700	0.0000
Zr-98	30.700 s	1.30	1.0626E+22	6.4841E+09	0.0019	0.9070	0.0000
Ce-145	2.9500 m	2.03	6.0297E+22	6.3818E+09	0.7740	0.6910	0.0000
Xe-139	39.680 s	0.35	1.3464E+22	6.3567E+09	0.8940	1.7800	0.0000
Kr-89	3.1500 m	1.27	5.9138E+22	5.8617E+09	1.8460	1.3780	0.0000
Kr-90	32.320 s	0.28	9.0823E+21	5.2644E+09	1.3230	1.3600	0.0000
Sr-93	7.4230 m	0.32	1.1446E+23	4.8146E+09	2.2200	0.7870	0.0000
Mo-104	1.0000 m	3.33	1.4245E+22	4.4477E+09	0.1470	0.6850	0.0000
Ce-147	57.000 s	3.51	1.2883E+22	4.2340E+09	0.2004	1.4990	0.0000
Br-87	55.700 s	0.36	1.1966E+22	4.0245E+09	3.1060	1.6790	0.0000
Br-86	55.000 s	1.46	1.1612E+22	3.9551E+09	3.3060	1.9440	0.0000
Cs-139	9.2700 m	0.54	1.1547E+23	3.8893E+09	0.3290	1.6500	0.0000
Nb-99m	2.6000 m	7.69	3.2072E+22	3.8514E+09	0.7550	1.4700	0.0000
Y-95	10.300 m	0.97	1.2641E+23	3.8319E+09	1.2910	1.3520	0.0000
Sr-95	23.900 s	0.59	4.4300E+21	3.4724E+09	1.0200	2.3000	0.0000
Sb-132	2.7900 m	1.79	2.9776E+22	3.3323E+09	2.6100	1.2400	0.0000
Cs-141	24.940 s	0.24	4.3702E+21	3.2827E+09	1.0100	1.8800	0.0000
Ba-142	10.600 m	1.89	1.0951E+23	3.2257E+09	1.0400	0.3780	0.0000
Ce-148	56.000 s	1.79	9.3109E+21	3.1148E+09	0.3180	0.6330	0.0000
Sb-133	2.5000 m	4.00	2.4361E+22	3.0425E+09	4.3440	0.0000	0.0000
La-145	24.800 s	8.06	4.0272E+21	3.0421E+09	0.6430	1.4800	0.0000
Pr-148	2.2900 m	0.87	2.0550E+22	2.8019E+09	0.8870	1.7900	0.0000
Xe-138	14.080 m	0.57	1.2394E+23	2.7484E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	1.1728E+23	2.5897E+09	0.2515	1.5000	0.0000
Tc-102	5.2800 s	2.84	7.1870E+20	2.5500E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	9.1569E+22	2.5301E+09	0.0189	0.3510	0.0000
I-136m	46.900 s	2.13	6.1780E+21	2.4677E+09	2.1360	2.1900	0.0000
Br-85	2.9000 m	2.07	2.1635E+22	2.3294E+09	0.0614	1.0410	0.0000
Mo-101	14.610 m	0.21	1.0874E+23	2.3240E+09	1.5100	0.5120	0.0000
Ba-141	18.270 m	0.38	1.2237E+23	2.0912E+09	0.8470	0.9670	0.0000
Pr-149	2.2600 m	3.10	1.4241E+22	1.9674E+09	0.1800	0.9439	0.0000
I-137	24.510 s	0.24	2.5463E+21	1.9462E+09	1.1400	1.9600	0.0000
Sb-132m	4.1000 m	1.71	2.5043E+22	1.9071E+09	2.5900	1.3400	0.0000
Mo-105	35.600 s	4.49	3.5665E+21	1.8768E+09	0.5511	1.9000	0.0000
Te-133	12.450 m	2.41	6.3403E+22	1.5900E+09	0.9540	0.7970	0.0000
Rb-90m	4.3000 m	1.55	2.1283E+22	1.5454E+09	3.3000	1.4030	0.0000
Y-94	18.700 m	0.53	9.1543E+22	1.5285E+09	0.7780	1.8130	0.0000
Se-84	3.1000 m	3.23	1.4141E+22	1.4242E+09	0.4082	0.5404	0.0000
Sn-130m	1.7000 m	5.88	7.7313E+21	1.4200E+09	0.7926	1.4440	0.0000
Ce-146	13.520 m	0.96	6.1400E+22	1.4180E+09	0.2890	0.0431	0.0000
Se-85	31.700 s	2.84	2.3781E+21	1.4054E+09	2.0540	1.9310	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 958
Total activity (Ci) = 2.42477E+11

Total number of decays = 5.09394E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 31.399
Average chain length = 3.5476

Average gamma E (MeV) = 1.2380
Average beta E (MeV) = 1.2786
Average alpha E (MeV) = 1.36103E-23

Composite Exposure Rate Conversion Factor = 21.4152489 R/hr per Ci/m2
Composite ECF per FGR table = 3.37088251 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.4754238 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.35812044 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-140	1.0620 m	0.47	3.1710E+22	9.3227E+09	2.2600	1.7500	0.0000
Sr-94	1.2550 m	0.53	3.4725E+22	8.6391E+09	1.4270	0.8350	0.0000
Tc-103	54.200 s	1.48	2.2643E+22	7.8263E+09	0.2486	0.9830	0.0000
Xe-137	3.8180 m	0.34	9.1640E+22	7.4941E+09	0.1960	1.7030	0.0000
Rb-91	58.400 s	0.68	2.3348E+22	7.4897E+09	2.3400	1.5800	0.0000
Rb-90	2.6330 m	3.17	5.6409E+22	6.6891E+09	1.8500	1.9800	0.0000
La-144	40.800 s	0.98	1.3383E+22	6.1448E+09	2.1700	1.6100	0.0000
Ce-145	2.9500 m	2.03	5.6057E+22	5.9331E+09	0.7740	0.6910	0.0000
Kr-89	3.1500 m	1.27	5.3327E+22	5.2858E+09	1.8460	1.3780	0.0000
Mo-103	1.1320 m	0.88	1.8923E+22	5.2193E+09	0.0000	0.0000	0.0000
I-136	1.3900 m	1.20	2.3090E+22	5.1866E+09	2.4600	1.9700	0.0000
Sr-93	7.4230 m	0.32	1.0955E+23	4.6079E+09	2.2200	0.7870	0.0000
Cs-139	9.2700 m	0.54	1.1662E+23	3.9280E+09	0.3290	1.6500	0.0000
Xe-139	39.680 s	0.35	8.2273E+21	3.8843E+09	0.8940	1.7800	0.0000
Y-95	10.300 m	0.97	1.2491E+23	3.7863E+09	1.2910	1.3520	0.0000
Nb-98	2.8600 s	2.10	5.7752E+20	3.7829E+09	0.5110	1.7770	0.0000
Zr-98	30.700 s	1.30	5.6218E+21	3.4305E+09	0.0019	0.9070	0.0000
Nb-99m	2.6000 m	7.69	2.8295E+22	3.3979E+09	0.7550	1.4700	0.0000
Mo-104	1.0000 m	3.33	1.0285E+22	3.2111E+09	0.1470	0.6850	0.0000
Ba-142	10.600 m	1.89	1.0620E+23	3.1280E+09	1.0400	0.3780	0.0000
Sb-132	2.7900 m	1.79	2.6985E+22	3.0198E+09	2.6100	1.2400	0.0000
Ce-147	57.000 s	3.51	9.1430E+21	3.0049E+09	0.2004	1.4990	0.0000
Kr-90	32.320 s	0.28	4.9609E+21	2.8755E+09	1.3230	1.3600	0.0000
Br-87	55.700 s	0.36	8.4245E+21	2.8334E+09	3.1060	1.6790	0.0000
Br-86	55.000 s	1.46	8.2367E+21	2.8055E+09	3.3060	1.9440	0.0000
Pr-148	2.2900 m	0.87	2.0372E+22	2.7776E+09	0.8870	1.7900	0.0000
Xe-138	14.080 m	0.57	1.2111E+23	2.6856E+09	1.1300	0.6390	0.0000
Sb-133	2.5000 m	4.00	2.1385E+22	2.6708E+09	4.3440	0.0000	0.0000
La-143	14.140 m	1.13	1.1498E+23	2.5388E+09	0.2515	1.5000	0.0000
Tc-102	5.2800 s	2.84	6.9827E+20	2.4775E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	8.8967E+22	2.4582E+09	0.0189	0.3510	0.0000
Mo-101	14.610 m	0.21	1.0635E+23	2.2728E+09	1.5100	0.5120	0.0000
Ce-148	56.000 s	1.79	6.5677E+21	2.1971E+09	0.3180	0.6330	0.0000
Br-85	2.9000 m	2.07	2.0366E+22	2.1927E+09	0.0614	1.0410	0.0000
Ba-141	18.270 m	0.38	1.2255E+23	2.0944E+09	0.8470	0.9670	0.0000
Sb-132m	4.1000 m	1.71	2.3130E+22	1.7614E+09	2.5900	1.3400	0.0000
Pr-149	2.2600 m	3.10	1.2329E+22	1.7033E+09	0.1800	0.9439	0.0000
Y-94	18.700 m	0.53	1.0016E+23	1.6724E+09	0.7780	1.8130	0.0000
I-136m	46.900 s	2.13	4.0725E+21	1.6267E+09	2.1360	2.1900	0.0000
Te-133	12.450 m	2.41	6.4244E+22	1.6111E+09	0.9540	0.7970	0.0000
Sr-95	23.900 s	0.59	1.9554E+21	1.5327E+09	1.0200	2.3000	0.0000
Cs-141	24.940 s	0.24	1.9959E+21	1.4992E+09	1.0100	1.8800	0.0000
Rb-90m	4.3000 m	1.55	2.0247E+22	1.4702E+09	3.3000	1.4030	0.0000
Ce-146	13.520 m	0.96	5.9944E+22	1.3843E+09	0.2890	0.0431	0.0000
La-145	24.800 s	8.06	1.8312E+21	1.3832E+09	0.6430	1.4800	0.0000
Se-84	3.1000 m	3.23	1.2730E+22	1.2822E+09	0.4082	0.5404	0.0000
Sn-130m	1.7000 m	5.88	6.3831E+21	1.1724E+09	0.7926	1.4440	0.0000
Y-93m	0.82000 s	4.88	5.0557E+19	1.1550E+09	0.8600	0.0790	0.0000
Mo-105	35.600 s	4.49	2.0597E+21	1.0839E+09	0.5511	1.9000	0.0000
Tc-105	7.6000 m	1.32	2.5878E+22	1.0631E+09	0.5390	1.4300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 948
Total activity (Ci) = 1.89825E+11

Total number of decays = 5.31737E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 32.776
Average chain length = 3.5476

Average gamma E (MeV) = 1.2380
Average beta E (MeV) = 1.2351
Average alpha E (MeV) = 1.73854E-23

Composite Exposure Rate Conversion Factor = 21.4048519 R/hr per Ci/m2
Composite ECF per FGR table = 3.56917071 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.4748669 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.94506025 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-137	3.8180 m	0.34	8.3013E+22	6.7887E+09	0.1960	1.7030	0.0000
Tc-103	54.200 s	1.48	1.8970E+22	6.5569E+09	0.2486	0.9830	0.0000
Cs-140	1.0620 m	0.47	2.1650E+22	6.3650E+09	2.2600	1.7500	0.0000
Sr-94	1.2550 m	0.53	2.5110E+22	6.2471E+09	1.4270	0.8350	0.0000
Rb-90	2.6330 m	3.17	5.0475E+22	5.9855E+09	1.8500	1.9800	0.0000
Ce-145	2.9500 m	2.03	4.9895E+22	5.2809E+09	0.7740	0.6910	0.0000
Rb-91	58.400 s	0.68	1.5372E+22	4.9312E+09	2.3400	1.5800	0.0000
Kr-89	3.1500 m	1.27	4.6866E+22	4.6454E+09	1.8460	1.3780	0.0000
Sr-93	7.4230 m	0.32	1.0371E+23	4.3622E+09	2.2200	0.7870	0.0000
I-136	1.3900 m	1.20	1.7294E+22	3.8848E+09	2.4600	1.9700	0.0000
Cs-139	9.2700 m	0.54	1.1531E+23	3.8837E+09	0.3290	1.6500	0.0000
Y-95	10.300 m	0.97	1.2129E+23	3.6767E+09	1.2910	1.3520	0.0000
Mo-103	1.1320 m	0.88	1.3210E+22	3.6436E+09	0.0000	0.0000	0.0000
La-144	40.800 s	0.98	7.3665E+21	3.3824E+09	2.1700	1.6100	0.0000
Ba-142	10.600 m	1.89	1.0220E+23	3.0103E+09	1.0400	0.3780	0.0000
Nb-99m	2.6000 m	7.69	2.4196E+22	2.9057E+09	0.7550	1.4700	0.0000
Sb-132	2.7900 m	1.79	2.3671E+22	2.6490E+09	2.6100	1.2400	0.0000
Pr-148	2.2900 m	0.87	1.9168E+22	2.6135E+09	0.8870	1.7900	0.0000
Xe-138	14.080 m	0.57	1.1766E+23	2.6091E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	1.1182E+23	2.4691E+09	0.2515	1.5000	0.0000
Tc-102	5.2800 s	2.84	6.7358E+20	2.3899E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	8.5820E+22	2.3713E+09	0.0189	0.3510	0.0000
Sb-133	2.5000 m	4.00	1.8173E+22	2.2697E+09	4.3440	0.0000	0.0000
Mo-101	14.610 m	0.21	1.0343E+23	2.2104E+09	1.5100	0.5120	0.0000
Mo-104	1.0000 m	3.33	6.8470E+21	2.1378E+09	0.1470	0.6850	0.0000
Xe-139	39.680 s	0.35	4.4472E+21	2.0996E+09	0.8940	1.7800	0.0000
Ba-141	18.270 m	0.38	1.2109E+23	2.0693E+09	0.8470	0.9670	0.0000
Br-85	2.9000 m	2.07	1.8338E+22	1.9743E+09	0.0614	1.0410	0.0000
Ce-147	57.000 s	3.51	5.9580E+21	1.9582E+09	0.2004	1.4990	0.0000
Br-87	55.700 s	0.36	5.4352E+21	1.8280E+09	3.1060	1.6790	0.0000
Br-86	55.000 s	1.46	5.3129E+21	1.8096E+09	3.3060	1.9440	0.0000
Y-94	18.700 m	0.53	1.0751E+23	1.7951E+09	0.7780	1.8130	0.0000
Nb-98	2.8600 s	2.10	2.6077E+20	1.7081E+09	0.5110	1.7770	0.0000
Te-133	12.450 m	2.41	6.4853E+22	1.6264E+09	0.9540	0.7970	0.0000
Sb-132m	4.1000 m	1.71	2.0945E+22	1.5950E+09	2.5900	1.3400	0.0000
Zr-98	30.700 s	1.30	2.5384E+21	1.5490E+09	0.0019	0.9070	0.0000
Pr-149	2.2600 m	3.10	1.0298E+22	1.4227E+09	0.1800	0.9439	0.0000
Ce-148	56.000 s	1.79	4.2472E+21	1.4208E+09	0.3180	0.6330	0.0000
Rb-90m	4.3000 m	1.55	1.8746E+22	1.3612E+09	3.3000	1.4030	0.0000
Kr-90	32.320 s	0.28	2.3310E+21	1.3511E+09	1.3230	1.3600	0.0000
Ce-146	13.520 m	0.96	5.8168E+22	1.3433E+09	0.2890	0.0431	0.0000
Se-84	3.1000 m	3.23	1.1164E+22	1.1245E+09	0.4082	0.5404	0.0000
Y-93m	0.82000 s	4.88	4.7861E+19	1.0934E+09	0.8600	0.0790	0.0000
Te-134	41.800 m	1.91	1.4067E+23	1.0508E+09	0.8580	0.2430	0.0000
Tc-105	7.6000 m	1.32	2.5521E+22	1.0485E+09	0.5390	1.4300	0.0000
I-136m	46.900 s	2.13	2.4200E+21	9.6665E+08	2.1360	2.1900	0.0000
Rb-89	15.400 m	1.30	4.6621E+22	9.4522E+08	2.0700	1.0200	0.0000
Sn-130m	1.7000 m	5.88	5.0246E+21	9.2284E+08	0.7926	1.4440	0.0000
Pr-147	13.400 m	2.98	3.9017E+22	9.0913E+08	0.8640	0.7810	0.0000
Sb-131	23.030 m	0.17	5.8598E+22	7.9444E+08	1.8100	0.5820	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 921
Total activity (Ci) = 1.48528E+11

Total number of decays = 5.53568E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 34.122
Average chain length = 3.5476

Average gamma E (MeV) = 1.2224
Average beta E (MeV) = 1.1939
Average alpha E (MeV) = 2.22193E-23

Composite Exposure Rate Conversion Factor = 21.1615009 R/hr per Ci/m2
Composite ECF per FGR table = 3.98335028 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.2801132 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.67809343 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-137	3.8180 m	0.34	7.2930E+22	5.9641E+09	0.1960	1.7030	0.0000
Rb-90	2.6330 m	3.17	4.2775E+22	5.0724E+09	1.8500	1.9800	0.0000
Tc-103	54.200 s	1.48	1.4387E+22	4.9728E+09	0.2486	0.9830	0.0000
Ce-145	2.9500 m	2.03	4.2438E+22	4.4916E+09	0.7740	0.6910	0.0000
Sr-94	1.2550 m	0.53	1.6750E+22	4.1673E+09	1.4270	0.8350	0.0000
Sr-93	7.4230 m	0.32	9.6846E+22	4.0736E+09	2.2200	0.7870	0.0000
Kr-89	3.1500 m	1.27	3.9885E+22	3.9534E+09	1.8460	1.3780	0.0000
Cs-140	1.0620 m	0.47	1.3423E+22	3.9462E+09	2.2600	1.7500	0.0000
Cs-139	9.2700 m	0.54	1.1147E+23	3.7544E+09	0.3290	1.6500	0.0000
Y-95	10.300 m	0.97	1.1595E+23	3.5147E+09	1.2910	1.3520	0.0000
Rb-91	58.400 s	0.68	9.1208E+21	2.9258E+09	2.3400	1.5800	0.0000
Ba-142	10.600 m	1.89	9.7414E+22	2.8694E+09	1.0400	0.3780	0.0000
I-136	1.3900 m	1.20	1.2016E+22	2.6990E+09	2.4600	1.9700	0.0000
Xe-138	14.080 m	0.57	1.1349E+23	2.5166E+09	1.1300	0.6390	0.0000
Nb-99m	2.6000 m	7.69	1.9901E+22	2.3899E+09	0.7550	1.4700	0.0000
La-143	14.140 m	1.13	1.0789E+23	2.3824E+09	0.2515	1.5000	0.0000
Mo-103	1.1320 m	0.88	8.4327E+21	2.3259E+09	0.0000	0.0000	0.0000
Pr-148	2.2900 m	0.87	1.6937E+22	2.3093E+09	0.8870	1.7900	0.0000
Tc-102	5.2800 s	2.84	6.4397E+20	2.2848E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	8.2047E+22	2.2670E+09	0.0189	0.3510	0.0000
Sb-132	2.7900 m	1.79	1.9944E+22	2.2319E+09	2.6100	1.2400	0.0000
Mo-101	14.610 m	0.21	9.9894E+22	2.1348E+09	1.5100	0.5120	0.0000
Ba-141	18.270 m	0.38	1.1828E+23	2.0214E+09	0.8470	0.9670	0.0000
Y-94	18.700 m	0.53	1.1287E+23	1.8845E+09	0.7780	1.8130	0.0000
Sb-133	2.5000 m	4.00	1.4831E+22	1.8523E+09	4.3440	0.0000	0.0000
Br-85	2.9000 m	2.07	1.5723E+22	1.6928E+09	0.0614	1.0410	0.0000
Te-133	12.450 m	2.41	6.5044E+22	1.6312E+09	0.9540	0.7970	0.0000
La-144	40.800 s	0.98	3.4905E+21	1.6027E+09	2.1700	1.6100	0.0000
Sb-132m	4.1000 m	1.71	1.8504E+22	1.4091E+09	2.5900	1.3400	0.0000
Ce-146	13.520 m	0.96	5.6022E+22	1.2938E+09	0.2890	0.0431	0.0000
Mo-104	1.0000 m	3.33	4.1194E+21	1.2862E+09	0.1470	0.6850	0.0000
Rb-90m	4.3000 m	1.55	1.6831E+22	1.2221E+09	3.3000	1.4030	0.0000
Ce-147	57.000 s	3.51	3.4900E+21	1.1470E+09	0.2004	1.4990	0.0000
Pr-149	2.2600 m	3.10	8.2246E+21	1.1363E+09	0.1800	0.9439	0.0000
Br-87	55.700 s	0.36	3.1443E+21	1.0575E+09	3.1060	1.6790	0.0000
Rb-89	15.400 m	1.30	5.1972E+22	1.0537E+09	2.0700	1.0200	0.0000
Br-86	55.000 s	1.46	3.0579E+21	1.0416E+09	3.3060	1.9440	0.0000
Te-134	41.800 m	1.91	1.3897E+23	1.0381E+09	0.8580	0.2430	0.0000
Y-93m	0.82000 s	4.88	4.4694E+19	1.0211E+09	0.8600	0.0790	0.0000
Tc-105	7.6000 m	1.32	2.4445E+22	1.0043E+09	0.5390	1.4300	0.0000
Xe-139	39.680 s	0.35	2.0626E+21	9.7381E+08	0.8940	1.7800	0.0000
Se-84	3.1000 m	3.23	9.4766E+21	9.5447E+08	0.4082	0.5404	0.0000
Pr-147	13.400 m	2.98	3.9983E+22	9.3164E+08	0.8640	0.7810	0.0000
Ce-148	56.000 s	1.79	2.4642E+21	8.2436E+08	0.3180	0.6330	0.0000
Sb-131	23.030 m	0.17	5.8910E+22	7.9867E+08	1.8100	0.5820	0.0000
Tc-104	18.300 m	1.64	4.3587E+22	7.4366E+08	2.0000	1.6100	0.0000
Sn-130m	1.7000 m	5.88	3.7265E+21	6.8442E+08	0.7926	1.4440	0.0000
Sn-130	3.7200 m	1.08	7.9047E+21	6.6346E+08	0.9650	0.4750	0.0000
Nb-98	2.8600 s	2.10	9.6602E+19	6.3277E+08	0.5110	1.7770	0.0000
Sn-129	2.2300 m	1.79	4.4898E+21	6.2863E+08	1.0080	1.2940	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 909
Total activity (Ci) = 1.16636E+11

Total number of decays = 5.74934E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 35.439
Average chain length = 3.5476

Average gamma E (MeV) = 1.1950
Average beta E (MeV) = 1.1572
Average alpha E (MeV) = 2.82951E-23

Composite Exposure Rate Conversion Factor = 20.7512093 R/hr per Ci/m2
Composite ECF per FGR table = 4.68150949 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.9371500 Rem/hr per Ci/m2

Fission Product Source

Point in time = 4.59357548 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-137	3.8180 m	0.34	6.1844E+22	5.0575E+09	0.1960	1.7030	0.0000
Rb-90	2.6330 m	3.17	3.4142E+22	4.0486E+09	1.8500	1.9800	0.0000
Sr-93	7.4230 m	0.32	8.8911E+22	3.7398E+09	2.2200	0.7870	0.0000
Ce-145	2.9500 m	2.03	3.4362E+22	3.6369E+09	0.7740	0.6910	0.0000
Cs-139	9.2700 m	0.54	1.0532E+23	3.5472E+09	0.3290	1.6500	0.0000
Tc-103	54.200 s	1.48	9.6428E+21	3.3329E+09	0.2486	0.9830	0.0000
Y-95	10.300 m	0.97	1.0917E+23	3.3093E+09	1.2910	1.3520	0.0000
Kr-89	3.1500 m	1.27	3.2608E+22	3.2321E+09	1.8460	1.3780	0.0000
Ba-142	10.600 m	1.89	9.1753E+22	2.7026E+09	1.0400	0.3780	0.0000
Sr-94	1.2550 m	0.53	1.0103E+22	2.5134E+09	1.4270	0.8350	0.0000
Xe-138	14.080 m	0.57	1.0849E+23	2.4057E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	1.0316E+23	2.2779E+09	0.2515	1.5000	0.0000
Cs-140	1.0620 m	0.47	7.3853E+21	2.1713E+09	2.2600	1.7500	0.0000
Tc-102	5.2800 s	2.84	6.0880E+20	2.1601E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	7.7567E+22	2.1432E+09	0.0189	0.3510	0.0000
Mo-101	14.610 m	0.21	9.5648E+22	2.0441E+09	1.5100	0.5120	0.0000
Ba-141	18.270 m	0.38	1.1442E+23	1.9553E+09	0.8470	0.9670	0.0000
Y-94	18.700 m	0.53	1.1563E+23	1.9306E+09	0.7780	1.8130	0.0000
Pr-148	2.2900 m	0.87	1.3883E+22	1.8929E+09	0.8870	1.7900	0.0000
Nb-99m	2.6000 m	7.69	1.5591E+22	1.8723E+09	0.7550	1.4700	0.0000
Sb-132	2.7900 m	1.79	1.5998E+22	1.7903E+09	2.6100	1.2400	0.0000
I-136	1.3900 m	1.20	7.6146E+21	1.7104E+09	2.4600	1.9700	0.0000
Te-133	12.450 m	2.41	6.4587E+22	1.6197E+09	0.9540	0.7970	0.0000
Rb-91	58.400 s	0.68	4.7522E+21	1.5244E+09	2.3400	1.5800	0.0000
Sb-133	2.5000 m	4.00	1.1506E+22	1.4370E+09	4.3440	0.0000	0.0000
Br-85	2.9000 m	2.07	1.2772E+22	1.3751E+09	0.0614	1.0410	0.0000
Mo-103	1.1320 m	0.88	4.8141E+21	1.3278E+09	0.0000	0.0000	0.0000
Ce-146	13.520 m	0.96	5.3454E+22	1.2344E+09	0.2890	0.0431	0.0000
Sb-132m	4.1000 m	1.71	1.5851E+22	1.2071E+09	2.5900	1.3400	0.0000
Rb-89	15.400 m	1.30	5.6999E+22	1.1556E+09	2.0700	1.0200	0.0000
Rb-90m	4.3000 m	1.55	1.4597E+22	1.0599E+09	3.3000	1.4030	0.0000
Te-134	41.800 m	1.91	1.3688E+23	1.0224E+09	0.8580	0.2430	0.0000
Y-93m	0.82000 s	4.88	4.1032E+19	9.3743E+08	0.8600	0.0790	0.0000
Tc-105	7.6000 m	1.32	2.2763E+22	9.3516E+08	0.5390	1.4300	0.0000
Pr-147	13.400 m	2.98	3.9791E+22	9.2715E+08	0.8640	0.7810	0.0000
Pr-149	2.2600 m	3.10	6.2111E+21	8.5810E+08	0.1800	0.9439	0.0000
Sb-131	23.030 m	0.17	5.8404E+22	7.9181E+08	1.8100	0.5820	0.0000
Se-84	3.1000 m	3.23	7.7224E+21	7.7779E+08	0.4082	0.5404	0.0000
Tc-104	18.300 m	1.64	4.4000E+22	7.5071E+08	2.0000	1.6100	0.0000
Mo-104	1.0000 m	3.33	2.1840E+21	6.8190E+08	0.1470	0.6850	0.0000
La-144	40.800 s	0.98	1.3729E+21	6.3037E+08	2.1700	1.6100	0.0000
Ce-147	57.000 s	3.51	1.7895E+21	5.8814E+08	0.2004	1.4990	0.0000
Sn-130	3.7200 m	1.08	6.6650E+21	5.5941E+08	0.9650	0.4750	0.0000
Br-87	55.700 s	0.36	1.5873E+21	5.3386E+08	3.1060	1.6790	0.0000
Br-86	55.000 s	1.46	1.5311E+21	5.2150E+08	3.3060	1.9440	0.0000
Sn-129	2.2300 m	1.79	3.3779E+21	4.7295E+08	1.0080	1.2940	0.0000
Sn-130m	1.7000 m	5.88	2.5656E+21	4.7121E+08	0.7926	1.4440	0.0000
Tc-101	14.200 m	0.70	1.9832E+22	4.3608E+08	0.3387	0.4770	0.0000
Ce-148	56.000 s	1.79	1.2486E+21	4.1768E+08	0.3180	0.6330	0.0000
Sb-130m	6.3000 m	3.17	8.1796E+21	4.0538E+08	2.6500	1.0100	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 894
Total activity (Ci) = 9.22343E+10

Total number of decays = 5.95956E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 36.735
Average chain length = 3.5476

Average gamma E (MeV) = 1.1620
Average beta E (MeV) = 1.1253
Average alpha E (MeV) = 3.57811E-23

Composite Exposure Rate Conversion Factor = 20.2753181 R/hr per Ci/m2
Composite ECF per FGR table = 5.67445469 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.5251179 Rem/hr per Ci/m2

Fission Product Source

Point in time = 5.73692894 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-137	3.8180 m	0.34	5.0269E+22	4.1109E+09	0.1960	1.7030	0.0000
Sr-93	7.4230 m	0.32	7.9908E+22	3.3611E+09	2.2200	0.7870	0.0000
Cs-139	9.2700 m	0.54	9.7211E+22	3.2742E+09	0.3290	1.6500	0.0000
Y-95	10.300 m	0.97	1.0112E+23	3.0652E+09	1.2910	1.3520	0.0000
Rb-90	2.6330 m	3.17	2.5478E+22	3.0213E+09	1.8500	1.9800	0.0000
Ce-145	2.9500 m	2.03	2.6297E+22	2.7833E+09	0.7740	0.6910	0.0000
Kr-89	3.1500 m	1.27	2.5354E+22	2.5131E+09	1.8460	1.3780	0.0000
Ba-142	10.600 m	1.89	8.5143E+22	2.5079E+09	1.0400	0.3780	0.0000
Xe-138	14.080 m	0.57	1.0255E+23	2.2740E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	9.7538E+22	2.1538E+09	0.2515	1.5000	0.0000
Tc-102	5.2800 s	2.84	5.6756E+20	2.0137E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	7.2313E+22	1.9981E+09	0.0189	0.3510	0.0000
Mo-101	14.610 m	0.21	9.0598E+22	1.9361E+09	1.5100	0.5120	0.0000
Y-94	18.700 m	0.53	1.1545E+23	1.9277E+09	0.7780	1.8130	0.0000
Tc-103	54.200 s	1.48	5.5440E+21	1.9162E+09	0.2486	0.9830	0.0000
Ba-141	18.270 m	0.38	1.0960E+23	1.8730E+09	0.8470	0.9670	0.0000
Te-133	12.450 m	2.41	6.3224E+22	1.5856E+09	0.9540	0.7970	0.0000
Pr-148	2.2900 m	0.87	1.0411E+22	1.4195E+09	0.8870	1.7900	0.0000
Nb-99m	2.6000 m	7.69	1.1495E+22	1.3804E+09	0.7550	1.4700	0.0000
Sb-132	2.7900 m	1.79	1.2089E+22	1.3529E+09	2.6100	1.2400	0.0000
Sr-94	1.2550 m	0.53	5.3726E+21	1.3366E+09	1.4270	0.8350	0.0000
Rb-89	15.400 m	1.30	6.1202E+22	1.2408E+09	2.0700	1.0200	0.0000
Ce-146	13.520 m	0.96	5.0410E+22	1.1642E+09	0.2890	0.0431	0.0000
Br-85	2.9000 m	2.07	9.7631E+21	1.0511E+09	0.0614	1.0410	0.0000
Sb-133	2.5000 m	4.00	8.3803E+21	1.0466E+09	4.3440	0.0000	0.0000
Cs-140	1.0620 m	0.47	3.5017E+21	1.0295E+09	2.2600	1.7500	0.0000
Te-134	41.800 m	1.91	1.3431E+23	1.0032E+09	0.8580	0.2430	0.0000
Sb-132m	4.1000 m	1.71	1.3065E+22	9.9492E+08	2.5900	1.3400	0.0000
I-136	1.3900 m	1.20	4.3059E+21	9.6721E+08	2.4600	1.9700	0.0000
Pr-147	13.400 m	2.98	3.8485E+22	8.9672E+08	0.8640	0.7810	0.0000
Rb-90m	4.3000 m	1.55	1.2165E+22	8.8332E+08	3.3000	1.4030	0.0000
Tc-105	7.6000 m	1.32	2.0613E+22	8.4686E+08	0.5390	1.4300	0.0000
Y-93m	0.8200 s	4.88	3.6877E+19	8.4250E+08	0.8600	0.0790	0.0000
Sb-131	23.030 m	0.17	5.7079E+22	7.7385E+08	1.8100	0.5820	0.0000
Tc-104	18.300 m	1.64	4.3302E+22	7.3880E+08	2.0000	1.6100	0.0000
Rb-91	58.400 s	0.68	2.1051E+21	6.7529E+08	2.3400	1.5800	0.0000
Mo-103	1.1320 m	0.88	2.3904E+21	6.5931E+08	0.0000	0.0000	0.0000
Pr-149	2.2600 m	3.10	4.3740E+21	6.0429E+08	0.1800	0.9439	0.0000
Se-84	3.1000 m	3.23	5.9803E+21	6.0233E+08	0.4082	0.5404	0.0000
Tc-101	14.200 m	0.70	2.3667E+22	5.2038E+08	0.3387	0.4770	0.0000
Sn-130	3.7200 m	1.08	5.3861E+21	4.5207E+08	0.9650	0.4750	0.0000
Cs-138	33.420 m	0.54	4.3444E+22	4.0588E+08	2.3600	1.2400	0.0000
Sb-130m	6.3000 m	3.17	7.6597E+21	3.7961E+08	2.6500	1.0100	0.0000
Sn-129	2.2300 m	1.79	2.3676E+21	3.3149E+08	1.0080	1.2940	0.0000
Mo-104	1.0000 m	3.33	9.8870E+20	3.0870E+08	0.1470	0.6850	0.0000
Ru-107	3.7500 m	1.33	3.6037E+21	3.0004E+08	0.2060	1.2300	0.0000
Sn-130m	1.7000 m	5.88	1.6096E+21	2.9563E+08	0.7926	1.4440	0.0000
Te-133m	55.400 m	0.72	4.9238E+22	2.7750E+08	1.6960	0.6000	0.0000
Ce-147	57.000 s	3.51	7.7702E+20	2.5538E+08	0.2004	1.4990	0.0000
I-134m	3.6000 m	2.78	2.8708E+21	2.4898E+08	0.2860	0.0901	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 876
Total activity (Ci) = 7.36286E+10

Total number of decays = 6.16812E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 38.020
Average chain length = 3.5476

Average gamma E (MeV) = 1.1298
Average beta E (MeV) = 1.0963
Average alpha E (MeV) = 4.48234E-23

Composite Exposure Rate Conversion Factor = 19.8271255 R/hr per Ci/m2
Composite ECF per FGR table = 6.91025162 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.1222296 Rem/hr per Ci/m2

Fission Product Source

Point in time = 7.16485834 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-137	3.8180 m	0.34	3.8793E+22	3.1724E+09	0.1960	1.7030	0.0000
Cs-139	9.2700 m	0.54	8.7540E+22	2.9485E+09	0.3290	1.6500	0.0000
Sr-93	7.4230 m	0.32	6.9933E+22	2.9415E+09	2.2200	0.7870	0.0000
Y-95	10.300 m	0.97	9.1857E+22	2.7845E+09	1.2910	1.3520	0.0000
Ba-142	10.600 m	1.89	7.7553E+22	2.2844E+09	1.0400	0.3780	0.0000
Xe-138	14.080 m	0.57	9.5587E+22	2.1197E+09	1.1300	0.6390	0.0000
Rb-90	2.6330 m	3.17	1.7586E+22	2.0854E+09	1.8500	1.9800	0.0000
La-143	14.140 m	1.13	9.0944E+22	2.0082E+09	0.2515	1.5000	0.0000
Ce-145	2.9500 m	2.03	1.8807E+22	1.9905E+09	0.7740	0.6910	0.0000
Y-94	18.700 m	0.53	1.1235E+23	1.8758E+09	0.7780	1.8130	0.0000
Tc-102	5.2800 s	2.84	5.1997E+20	1.8449E+09	0.0786	1.9400	0.0000
Kr-89	3.1500 m	1.27	1.8518E+22	1.8355E+09	1.8460	1.3780	0.0000
Mo-102	11.300 m	1.77	6.6248E+22	1.8305E+09	0.0189	0.3510	0.0000
Mo-101	14.610 m	0.21	8.4663E+22	1.8093E+09	1.5100	0.5120	0.0000
Ba-141	18.270 m	0.38	1.0383E+23	1.7743E+09	0.8470	0.9670	0.0000
Te-133	12.450 m	2.41	6.0712E+22	1.5226E+09	0.9540	0.7970	0.0000
Rb-89	15.400 m	1.30	6.4002E+22	1.2976E+09	2.0700	1.0200	0.0000
Ce-146	13.520 m	0.96	4.6852E+22	1.0820E+09	0.2890	0.0431	0.0000
Te-134	41.800 m	1.91	1.3117E+23	9.7976E+08	0.8580	0.2430	0.0000
Pr-148	2.2900 m	0.87	7.0306E+21	9.5858E+08	0.8870	1.7900	0.0000
Sb-132	2.7900 m	1.79	8.4933E+21	9.5048E+08	2.6100	1.2400	0.0000
Nb-99m	2.6000 m	7.69	7.8556E+21	9.4336E+08	0.7550	1.4700	0.0000
Tc-103	54.200 s	1.48	2.6355E+21	9.1094E+08	0.2486	0.9830	0.0000
Pr-147	13.400 m	2.98	3.6226E+22	8.4409E+08	0.8640	0.7810	0.0000
Sb-132m	4.1000 m	1.71	1.0263E+22	7.8153E+08	2.5900	1.3400	0.0000
Br-85	2.9000 m	2.07	6.9504E+21	7.4832E+08	0.0614	1.0410	0.0000
Sb-131	23.030 m	0.17	5.5000E+22	7.4567E+08	1.8100	0.5820	0.0000
Tc-105	7.6000 m	1.32	1.8126E+22	7.4467E+08	0.5390	1.4300	0.0000
Y-93m	0.82000 s	4.88	3.2274E+19	7.3733E+08	0.8600	0.0790	0.0000
Tc-104	18.300 m	1.64	4.1624E+22	7.1017E+08	2.0000	1.6100	0.0000
Sb-133	2.5000 m	4.00	5.6406E+21	7.0446E+08	4.3440	0.0000	0.0000
Rb-90m	4.3000 m	1.55	9.6699E+21	7.0215E+08	3.3000	1.4030	0.0000
Tc-101	14.200 m	0.70	2.7803E+22	6.1133E+08	0.3387	0.4770	0.0000
Sr-94	1.2550 m	0.53	2.4416E+21	6.0744E+08	1.4270	0.8350	0.0000
I-136	1.3900 m	1.20	2.1126E+21	4.7455E+08	2.4600	1.9700	0.0000
Cs-138	33.420 m	0.54	4.9203E+22	4.5968E+08	2.3600	1.2400	0.0000
Se-84	3.1000 m	3.23	4.3457E+21	4.3770E+08	0.4082	0.5404	0.0000
Cs-140	1.0620 m	0.47	1.3789E+21	4.0539E+08	2.2600	1.7500	0.0000
Pr-149	2.2600 m	3.10	2.8228E+21	3.8998E+08	0.1800	0.9439	0.0000
Sn-130	3.7200 m	1.08	4.1279E+21	3.4646E+08	0.9650	0.4750	0.0000
Sb-130m	6.3000 m	3.17	6.8723E+21	3.4059E+08	2.6500	1.0100	0.0000
Te-133m	55.400 m	0.72	4.8835E+22	2.7523E+08	1.6960	0.6000	0.0000
Mo-103	1.1320 m	0.88	9.9710E+20	2.7502E+08	0.0000	0.0000	0.0000
Sr-92	2.7100 h	0.37	1.2748E+23	2.4480E+08	1.3410	0.1770	0.0000
Rb-91	58.400 s	0.68	7.6147E+20	2.4427E+08	2.3400	1.5800	0.0000
Pr-146	24.150 m	0.75	1.8268E+22	2.3618E+08	1.0200	1.3000	0.0000
Ru-107	3.7500 m	1.33	2.7678E+21	2.3045E+08	0.2060	1.2300	0.0000
Kr-87	1.2720 h	0.79	5.3834E+22	2.2024E+08	0.7960	1.3380	0.0000
I-134	52.500 m	0.38	3.6800E+22	2.1886E+08	2.6100	0.0618	0.0000
Sn-129	2.2300 m	1.79	1.5190E+21	2.1267E+08	1.0080	1.2940	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 861
Total activity (Ci) = 5.93997E+10

Total number of decays = 6.37714E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 39.309
Average chain length = 3.5476

Average gamma E (MeV) = 1.1019
Average beta E (MeV) = 1.0679
Average alpha E (MeV) = 5.55618E-23

Composite Exposure Rate Conversion Factor = 19.4538937 R/hr per Ci/m2
Composite ECF per FGR table = 8.30086136 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.7733755 Rem/hr per Ci/m2

Fission Product Source

Point in time = 8.94820118 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-139	9.2700 m	0.54	7.6653E+22	2.5818E+09	0.3290	1.6500	0.0000
Sr-93	7.4230 m	0.32	5.9205E+22	2.4903E+09	2.2200	0.7870	0.0000
Y-95	10.300 m	0.97	8.1469E+22	2.4696E+09	1.2910	1.3520	0.0000
Xe-137	3.8180 m	0.34	2.8064E+22	2.2950E+09	0.1960	1.7030	0.0000
Ba-142	10.600 m	1.89	6.9017E+22	2.0329E+09	1.0400	0.3780	0.0000
Xe-138	14.080 m	0.57	8.7553E+22	1.9415E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	8.3331E+22	1.8401E+09	0.2515	1.5000	0.0000
Y-94	18.700 m	0.53	1.0663E+23	1.7804E+09	0.7780	1.8130	0.0000
Mo-101	14.610 m	0.21	7.7795E+22	1.6625E+09	1.5100	0.5120	0.0000
Ba-141	18.270 m	0.38	9.7034E+22	1.6583E+09	0.8470	0.9670	0.0000
Tc-102	5.2800 s	2.84	4.6609E+20	1.6537E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	5.9384E+22	1.6408E+09	0.0189	0.3510	0.0000
Tc-133	12.450 m	2.41	5.6880E+22	1.4265E+09	0.9540	0.7970	0.0000
Rb-89	15.400 m	1.30	6.4826E+22	1.3143E+09	2.0700	1.0200	0.0000
Rb-90	2.6330 m	3.17	1.1053E+22	1.3106E+09	1.8500	1.9800	0.0000
Ce-145	2.9500 m	2.03	1.2369E+22	1.3092E+09	0.7740	0.6910	0.0000
Kr-89	3.1500 m	1.27	1.2507E+22	1.2397E+09	1.8460	1.3780	0.0000
Ce-146	13.520 m	0.96	4.2758E+22	9.8745E+08	0.2890	0.0431	0.0000
Te-134	41.800 m	1.91	1.2734E+23	9.5121E+08	0.8580	0.2430	0.0000
Pr-147	13.400 m	2.98	3.3223E+22	7.7411E+08	0.8640	0.7810	0.0000
Sb-131	23.030 m	0.17	5.2254E+22	7.0843E+08	1.8100	0.5820	0.0000
Tc-101	14.200 m	0.70	3.2059E+22	7.0491E+08	0.3387	0.4770	0.0000
Tc-104	18.300 m	1.64	3.9156E+22	6.6806E+08	2.0000	1.6100	0.0000
Tc-105	7.6000 m	1.32	1.5411E+22	6.3313E+08	0.5390	1.4300	0.0000
Y-93m	0.82000 s	4.88	2.7323E+19	6.2422E+08	0.8600	0.0790	0.0000
Sb-132	2.7900 m	1.79	5.4567E+21	6.1066E+08	2.6100	1.2400	0.0000
Nb-99m	2.6000 m	7.69	4.8832E+21	5.8641E+08	0.7550	1.4700	0.0000
Sb-132m	4.1000 m	1.71	7.5914E+21	5.7811E+08	2.5900	1.3400	0.0000
Pr-148	2.2900 m	0.87	4.1969E+21	5.7222E+08	0.8870	1.7900	0.0000
Rb-90m	4.3000 m	1.55	7.2550E+21	5.2679E+08	3.3000	1.4030	0.0000
Cs-138	33.420 m	0.54	5.5445E+22	5.1799E+08	2.3600	1.2400	0.0000
Br-85	2.9000 m	2.07	4.5399E+21	4.8879E+08	0.0614	1.0410	0.0000
Sb-133	2.5000 m	4.00	3.4402E+21	4.2965E+08	4.3440	0.0000	0.0000
Tc-103	54.200 s	1.48	9.8998E+20	3.4218E+08	0.2486	0.9830	0.0000
Se-84	3.1000 m	3.23	2.9167E+21	2.9377E+08	0.4082	0.5404	0.0000
Sb-130m	6.3000 m	3.17	5.8564E+21	2.9024E+08	2.6500	1.0100	0.0000
Pr-146	24.150 m	0.75	2.1345E+22	2.7597E+08	1.0200	1.3000	0.0000
Te-133m	55.400 m	0.72	4.8133E+22	2.7127E+08	1.6960	0.6000	0.0000
Sn-130	3.7200 m	1.08	2.9608E+21	2.4851E+08	0.9650	0.4750	0.0000
Sr-92	2.7100 h	0.37	1.2652E+23	2.4294E+08	1.3410	0.1770	0.0000
I-134	52.500 m	0.38	4.0332E+22	2.3987E+08	2.6100	0.0618	0.0000
Ba-139	1.3840 h	0.34	6.3710E+22	2.3955E+08	0.0454	0.8990	0.0000
Sr-94	1.2550 m	0.53	9.1183E+20	2.2685E+08	1.4270	0.8350	0.0000
Pr-149	2.2600 m	3.10	1.6336E+21	2.2569E+08	0.1800	0.9439	0.0000
Kr-87	1.2720 h	0.79	5.3134E+22	2.1737E+08	0.7960	1.3380	0.0000
I-136	1.3900 m	1.20	8.6818E+20	1.9501E+08	2.4600	1.9700	0.0000
La-142	1.5180 h	0.55	5.3589E+22	1.8371E+08	2.4900	0.8420	0.0000
Sb-130	39.500 m	2.03	2.2241E+22	1.7581E+08	3.2700	0.7030	0.0000
Te-131	25.000 m	0.40	1.3419E+22	1.6759E+08	0.4220	0.7210	0.0000
Ru-107	3.7500 m	1.33	1.9906E+21	1.6574E+08	0.2060	1.2300	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867388D+24

Total number of nuclides = 840
Total activity (Ci) = 4.83812E+10

Total number of decays = 6.58880E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 40.613
Average chain length = 3.5476

Average gamma E (MeV) = 1.0790
Average beta E (MeV) = 1.0389
Average alpha E (MeV) = 6.82178E-23

Composite Exposure Rate Conversion Factor = 19.1585064 R/hr per Ci/m2
Composite ECF per FGR table = 9.75950241 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.4876871 Rem/hr per Ci/m2

Fission Product Source

Point in time = 11.1754322 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-139	9.2700 m	0.54	6.4900E+22	2.1859E+09	0.3290	1.6500	0.0000
Y-95	10.300 m	0.97	7.0129E+22	2.1259E+09	1.2910	1.3520	0.0000
Sr-93	7.4230 m	0.32	4.8088E+22	2.0227E+09	2.2200	0.7870	0.0000
Ba-142	10.600 m	1.89	5.9663E+22	1.7574E+09	1.0400	0.3780	0.0000
Xe-138	14.080 m	0.57	7.8461E+22	1.7399E+09	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	7.4712E+22	1.6497E+09	0.2515	1.5000	0.0000
Y-94	18.700 m	0.53	9.8796E+22	1.6496E+09	0.7780	1.8130	0.0000
Xe-137	3.8180 m	0.34	1.8730E+22	1.5317E+09	0.1960	1.7030	0.0000
Ba-141	18.270 m	0.38	8.9171E+22	1.5239E+09	0.8470	0.9670	0.0000
Mo-101	14.610 m	0.21	6.9994E+22	1.4958E+09	1.5100	0.5120	0.0000
Tc-102	5.2800 s	2.84	4.0657E+20	1.4425E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	5.1801E+22	1.4313E+09	0.0189	0.3510	0.0000
Te-133	12.450 m	2.41	5.1690E+22	1.2963E+09	0.9540	0.7970	0.0000
Rb-89	15.400 m	1.30	6.3235E+22	1.2821E+09	2.0700	1.0200	0.0000
Te-134	41.800 m	1.91	1.2273E+23	9.1672E+08	0.8580	0.2430	0.0000
Ce-146	13.520 m	0.96	3.8144E+22	8.8090E+08	0.2890	0.0431	0.0000
Tc-101	14.200 m	0.70	3.6141E+22	7.9467E+08	0.3387	0.4770	0.0000
Ce-145	2.9500 m	2.03	7.3294E+21	7.7575E+08	0.7740	0.6910	0.0000
Kr-89	3.1500 m	1.27	7.6617E+21	7.5943E+08	1.8460	1.3780	0.0000
Rb-90	2.6330 m	3.17	6.1921E+21	7.3428E+08	1.8500	1.9800	0.0000
Pr-147	13.400 m	2.98	2.9663E+22	6.9117E+08	0.8640	0.7810	0.0000
Sb-131	23.030 m	0.17	4.8904E+22	6.6302E+08	1.8100	0.5820	0.0000
Tc-104	18.300 m	1.64	3.6068E+22	6.1537E+08	2.0000	1.6100	0.0000
Cs-138	33.420 m	0.54	6.1934E+22	5.7862E+08	2.3600	1.2400	0.0000
Tc-105	7.6000 m	1.32	1.2579E+22	5.1677E+08	0.5390	1.4300	0.0000
Y-93m	0.82000 s	4.88	2.2193E+19	5.0701E+08	0.8600	0.0790	0.0000
Sb-132m	4.1000 m	1.71	5.2095E+21	3.9672E+08	2.5900	1.3400	0.0000
Rb-90m	4.3000 m	1.55	5.0667E+21	3.6790E+08	3.3000	1.4030	0.0000
Sb-132	2.7900 m	1.79	3.1383E+21	3.5120E+08	2.6100	1.2400	0.0000
Nb-99m	2.6000 m	7.69	2.6967E+21	3.2384E+08	0.7550	1.4700	0.0000
Pr-146	24.150 m	0.75	2.4490E+22	3.1663E+08	1.0200	1.3000	0.0000
Pr-148	2.2900 m	0.87	2.1651E+21	2.9520E+08	0.8870	1.7900	0.0000
Br-85	2.9000 m	2.07	2.6661E+21	2.8705E+08	0.0614	1.0410	0.0000
Ba-139	1.3840 h	0.34	7.4185E+22	2.7893E+08	0.0454	0.8990	0.0000
Te-133m	55.400 m	0.72	4.7080E+22	2.6534E+08	1.6960	0.6000	0.0000
I-134	52.500 m	0.38	4.4232E+22	2.6306E+08	2.6100	0.0618	0.0000
Sr-92	2.7100 h	0.37	1.2532E+23	2.4065E+08	1.3410	0.1770	0.0000
Sb-130m	6.3000 m	3.17	4.6965E+21	2.3276E+08	2.6500	1.0100	0.0000
Sb-133	2.5000 m	4.00	1.8552E+21	2.3170E+08	4.3440	0.0000	0.0000
Kr-87	1.2720 h	0.79	5.2118E+22	2.1322E+08	0.7960	1.3380	0.0000
La-142	1.5180 h	0.55	6.1962E+22	2.1241E+08	2.4900	0.8420	0.0000
Te-131	25.000 m	0.40	1.5639E+22	1.9532E+08	0.4220	0.7210	0.0000
Se-84	3.1000 m	3.23	1.7726E+21	1.7853E+08	0.4082	0.5404	0.0000
Sb-130	39.500 m	2.03	2.2501E+22	1.7786E+08	3.2700	0.7030	0.0000
Br-84	31.800 m	0.25	1.6838E+22	1.6533E+08	1.7680	1.2360	0.0000
Sn-130	3.7200 m	1.08	1.9552E+21	1.6410E+08	0.9650	0.4750	0.0000
Nd-151	12.440 m	0.56	5.4570E+21	1.3696E+08	0.9170	0.6200	0.0000
Kr-88	2.8390 h	1.06	7.2880E+22	1.3359E+08	1.9550	0.3616	0.0000
Pr-149	2.2600 m	3.10	8.2504E+20	1.1398E+08	0.1800	0.9439	0.0000
I-135	6.5690 h	0.30	1.4098E+23	1.1168E+08	1.6500	0.3770	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 822
Total activity (Ci) = 3.96520E+10

Total number of decays = 6.80485E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 41.945
Average chain length = 3.5476

Average gamma E (MeV) = 1.0612
Average beta E (MeV) = 1.0094
Average alpha E (MeV) = 8.32400E-23

Composite Exposure Rate Conversion Factor = 18.9350414 R/hr per Ci/m2
Composite ECF per FGR table = 11.2224331 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.2645493 Rem/hr per Ci/m2

Fission Product Source

Point in time = 13.9570141 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-139	9.2700 m	0.54	5.2714E+22	1.7755E+09	0.3290	1.6500	0.0000
Y-95	10.300 m	0.97	5.8157E+22	1.7630E+09	1.2910	1.3520	0.0000
Sr-93	7.4230 m	0.32	3.7088E+22	1.5600E+09	2.2200	0.7870	0.0000
Xe-138	14.080 m	0.57	6.8420E+22	1.5172E+09	1.1300	0.6390	0.0000
Y-94	18.700 m	0.53	8.9314E+22	1.4912E+09	0.7780	1.8130	0.0000
Ba-142	10.600 m	1.89	4.9740E+22	1.4651E+09	1.0400	0.3780	0.0000
La-143	14.140 m	1.13	6.5189E+22	1.4394E+09	0.2515	1.5000	0.0000
Ba-141	18.270 m	0.38	8.0240E+22	1.3713E+09	0.8470	0.9670	0.0000
Mo-101	14.610 m	0.21	6.1340E+22	1.3109E+09	1.5100	0.5120	0.0000
Tc-102	5.2800 s	2.84	3.4279E+20	1.2163E+09	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	4.3675E+22	1.2068E+09	0.0189	0.3510	0.0000
Rb-89	15.400 m	1.30	5.9069E+22	1.1976E+09	2.0700	1.0200	0.0000
Te-133	12.450 m	2.41	4.5292E+22	1.1359E+09	0.9540	0.7970	0.0000
Xe-137	3.8180 m	0.34	1.1304E+22	9.2441E+08	0.1960	1.7030	0.0000
Te-134	41.800 m	1.91	1.1720E+23	8.7540E+08	0.8580	0.2430	0.0000
Tc-101	14.200 m	0.70	3.9632E+22	8.7143E+08	0.3387	0.4770	0.0000
Ce-146	13.520 m	0.96	3.3075E+22	7.6382E+08	0.2890	0.0431	0.0000
Cs-138	33.420 m	0.54	6.8289E+22	6.3799E+08	2.3600	1.2400	0.0000
Sb-131	23.030 m	0.17	4.4985E+22	6.0988E+08	1.8100	0.5820	0.0000
Pr-147	13.400 m	2.98	2.5700E+22	5.9882E+08	0.8640	0.7810	0.0000
Tc-104	18.300 m	1.64	3.2479E+22	5.5415E+08	2.0000	1.6100	0.0000
Kr-89	3.1500 m	1.27	4.1543E+21	4.1178E+08	1.8460	1.3780	0.0000
Ce-145	2.9500 m	2.03	3.8126E+21	4.0353E+08	0.7740	0.6910	0.0000
Tc-105	7.6000 m	1.32	9.7604E+21	4.0098E+08	0.5390	1.4300	0.0000
Y-93m	0.82000 s	4.88	1.7116E+19	3.9103E+08	0.8600	0.0790	0.0000
Rb-90	2.6330 m	3.17	3.0102E+21	3.5695E+08	1.8500	1.9800	0.0000
Pr-146	24.150 m	0.75	2.7479E+22	3.5527E+08	1.0200	1.3000	0.0000
Ba-139	1.3840 h	0.34	8.4524E+22	3.1781E+08	0.0454	0.8990	0.0000
I-134	52.500 m	0.38	4.8469E+22	2.8825E+08	2.6100	0.0618	0.0000
Te-133m	55.400 m	0.72	4.5639E+22	2.5722E+08	1.6960	0.6000	0.0000
Sb-132m	4.1000 m	1.71	3.2551E+21	2.4789E+08	2.5900	1.3400	0.0000
La-142	1.5180 h	0.55	7.0479E+22	2.4161E+08	2.4900	0.8420	0.0000
Sr-92	2.7100 h	0.37	1.2385E+23	2.3781E+08	1.3410	0.1770	0.0000
Rb-90m	4.3000 m	1.55	3.2359E+21	2.3496E+08	3.3000	1.4030	0.0000
Te-131	25.000 m	0.40	1.7955E+22	2.2425E+08	0.4220	0.7210	0.0000
Kr-87	1.2720 h	0.79	5.0828E+22	2.0794E+08	0.7960	1.3380	0.0000
Sb-132	2.7900 m	1.79	1.5725E+21	1.7598E+08	2.6100	1.2400	0.0000
Sb-130	39.500 m	2.03	2.2257E+22	1.7593E+08	3.2700	0.7030	0.0000
Sb-130m	6.3000 m	3.17	3.5081E+21	1.7386E+08	2.6500	1.0100	0.0000
Br-84	31.800 m	0.25	1.6642E+22	1.6340E+08	1.7680	1.2360	0.0000
Nb-99m	2.6000 m	7.69	1.2846E+21	1.5427E+08	0.7550	1.4700	0.0000
Br-85	2.9000 m	2.07	1.3713E+21	1.4764E+08	0.0614	1.0410	0.0000
Kr-88	2.8390 h	1.06	7.2059E+22	1.3208E+08	1.9550	0.3616	0.0000
Pr-148	2.2900 m	0.87	9.3772E+20	1.2785E+08	0.8870	1.7900	0.0000
Nd-151	12.440 m	0.56	4.6735E+21	1.1730E+08	0.9170	0.6200	0.0000
I-135	6.5690 h	0.30	1.4029E+23	1.1113E+08	1.6500	0.3770	0.0000
Sb-133	2.5000 m	4.00	8.5796E+20	1.0715E+08	4.3440	0.0000	0.0000
Sn-130	3.7200 m	1.08	1.1644E+21	9.7729E+07	0.9650	0.4750	0.0000
Se-84	3.1000 m	3.23	9.5170E+20	9.5854E+07	0.4082	0.5404	0.0000
Pm-152	4.1200 m	1.94	1.2359E+21	9.3660E+07	0.2800	1.3100	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867386D+24

Total number of nuclides = 811
Total activity (Ci) = 3.25512E+10

Total number of decays = 7.02627E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 43.310
Average chain length = 3.5476

Average gamma E (MeV) = 1.0492
Average beta E (MeV) = 0.98054
Average alpha E (MeV) = 1.01407E-22

Composite Exposure Rate Conversion Factor = 18.7948704 R/hr per Ci/m2
Composite ECF per FGR table = 12.6455784 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.1149769 Rem/hr per Ci/m2

Fission Product Source

Point in time = 17.4309502 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Y-95	10.300	m	0.97	4.6034E+22	1.3954E+09	1.2910	1.3520	0.0000
Cs-139	9.2700	m	0.54	4.0655E+22	1.3693E+09	0.3290	1.6500	0.0000
Y-94	18.700	m	0.53	7.8568E+22	1.3118E+09	0.7780	1.8130	0.0000
Xe-138	14.080	m	0.57	5.7665E+22	1.2787E+09	1.1300	0.6390	0.0000
La-143	14.140	m	1.13	5.4981E+22	1.2141E+09	0.2515	1.5000	0.0000
Ba-141	18.270	m	0.38	7.0332E+22	1.2020E+09	0.8470	0.9670	0.0000
Ba-142	10.600	m	1.89	3.9633E+22	1.1674E+09	1.0400	0.3780	0.0000
Sr-93	7.4230	m	0.32	2.6813E+22	1.1278E+09	2.2200	0.7870	0.0000
Mo-101	14.610	m	0.21	5.2020E+22	1.1117E+09	1.5100	0.5120	0.0000
Rb-89	15.400	m	1.30	5.2554E+22	1.0655E+09	2.0700	1.0200	0.0000
Tc-102	5.2800	s	2.84	2.7701E+20	9.8283E+08	0.0786	1.9400	0.0000
Mo-102	11.300	m	1.77	3.5293E+22	9.7518E+08	0.0189	0.3510	0.0000
Te-133	12.450	m	2.41	3.8029E+22	9.5372E+08	0.9540	0.7970	0.0000
Tc-101	14.200	m	0.70	4.2004E+22	9.2358E+08	0.3387	0.4770	0.0000
Te-134	41.800	m	1.91	1.1063E+23	8.2640E+08	0.8580	0.2430	0.0000
Cs-138	33.420	m	0.54	7.3953E+22	6.9091E+08	2.3600	1.2400	0.0000
Ce-146	13.520	m	0.96	2.7679E+22	6.3921E+08	0.2890	0.0431	0.0000
Sb-131	23.030	m	0.17	4.0520E+22	5.4935E+08	1.8100	0.5820	0.0000
Pr-147	13.400	m	2.98	2.1474E+22	5.0036E+08	0.8640	0.7810	0.0000
Xe-137	3.8180	m	0.34	6.0162E+21	4.9199E+08	0.1960	1.7030	0.0000
Tc-104	18.300	m	1.64	2.8477E+22	4.8587E+08	2.0000	1.6100	0.0000
Pr-146	24.150	m	0.75	2.9999E+22	3.8785E+08	1.0200	1.3000	0.0000
Ba-139	1.3840	h	0.34	9.3987E+22	3.5339E+08	0.0454	0.8990	0.0000
I-134	52.500	m	0.38	5.2981E+22	3.1509E+08	2.6100	0.0618	0.0000
Tc-105	7.6000	m	1.32	7.1100E+21	2.9210E+08	0.5390	1.4300	0.0000
Y-93m	0.82000	s	4.88	1.2374E+19	2.8271E+08	0.8600	0.0790	0.0000
La-142	1.5180	h	0.55	7.8611E+22	2.6948E+08	2.4900	0.8420	0.0000
Te-131	25.000	m	0.40	2.0222E+22	2.5255E+08	0.4220	0.7210	0.0000
Te-133m	55.400	m	0.72	4.3787E+22	2.4678E+08	1.6960	0.6000	0.0000
Sr-92	2.7100	h	0.37	1.2202E+23	2.3432E+08	1.3410	0.1770	0.0000
Kr-87	1.2720	h	0.79	4.9250E+22	2.0148E+08	0.7960	1.3380	0.0000
Kr-89	3.1500	m	1.27	1.9343E+21	1.9172E+08	1.8460	1.3780	0.0000
Ce-145	2.9500	m	2.03	1.6855E+21	1.7839E+08	0.7740	0.6910	0.0000
Sb-130	39.500	m	2.03	2.1498E+22	1.6993E+08	3.2700	0.7030	0.0000
Br-84	31.800	m	0.25	1.5921E+22	1.5632E+08	1.7680	1.2360	0.0000
Rb-90	2.6330	m	3.17	1.2289E+21	1.4572E+08	1.8500	1.9800	0.0000
Sb-132m	4.1000	m	1.71	1.8093E+21	1.3778E+08	2.5900	1.3400	0.0000
Rb-90m	4.3000	m	1.55	1.8484E+21	1.3421E+08	3.3000	1.4030	0.0000
Kr-88	2.8390	h	1.06	7.1048E+22	1.3023E+08	1.9550	0.3616	0.0000
Sb-130m	6.3000	m	3.17	2.4107E+21	1.1947E+08	2.6500	1.0100	0.0000
I-135	6.5690	h	0.30	1.3943E+23	1.1046E+08	1.6500	0.3770	0.0000
Nd-151	12.440	m	0.56	3.8510E+21	9.6656E+07	0.9170	0.6200	0.0000
Rh-107	21.700	m	1.84	6.0649E+21	8.7264E+07	0.3125	0.4370	0.0000
Pm-152	4.1200	m	1.94	1.0903E+21	8.2625E+07	0.2800	1.3100	0.0000
La-141	3.9190	h	0.77	6.2034E+22	8.2371E+07	1.4500	0.9626	0.0000
Rb-88	17.800	m	0.56	4.3666E+21	7.6594E+07	0.6370	2.0700	0.0000
Sb-132	2.7900	m	1.79	6.6338E+20	7.4239E+07	2.6100	1.2400	0.0000
Pr-145	5.9830	h	0.17	8.2257E+22	7.1544E+07	0.0159	0.6770	0.0000
Sr-91	9.6310	h	0.52	1.2538E+23	6.7747E+07	1.0480	0.6670	0.0000
Nd-149	1.7280	h	0.06	2.2315E+22	6.7201E+07	0.3850	0.5040	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 806
Total activity (Ci) = 2.66463E+10

Total number of decays = 7.25303E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 44.708
Average chain length = 3.5476

Average gamma E (MeV) = 1.0448
Average beta E (MeV) = 0.95345
Average alpha E (MeV) = 1.23895E-22

Composite Exposure Rate Conversion Factor = 18.7614517 R/hr per Ci/m2
Composite ECF per FGR table = 13.9935198 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.0596886 Rem/hr per Ci/m2

Fission Product Source

Point in time = 21.7695389 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Y-94	18.700 m	0.53	6.6903E+22	1.1171E+09	0.7780	1.8130	0.0000
Y-95	10.300 m	0.97	3.4378E+22	1.0421E+09	1.2910	1.3520	0.0000
Xe-138	14.080 m	0.57	4.6575E+22	1.0328E+09	1.1300	0.6390	0.0000
Ba-141	18.270 m	0.38	5.9658E+22	1.0195E+09	0.8470	0.9670	0.0000
Cs-139	9.2700 m	0.54	2.9392E+22	9.8996E+08	0.3290	1.6500	0.0000
La-143	14.140 m	1.13	4.4448E+22	9.8146E+08	0.2515	1.5000	0.0000
Tc-101	14.200 m	0.70	4.2677E+22	9.3838E+08	0.3387	0.4770	0.0000
Mo-101	14.610 m	0.21	4.2342E+22	9.0489E+08	1.5100	0.5120	0.0000
Rb-89	15.400 m	1.30	4.4296E+22	8.9807E+08	2.0700	1.0200	0.0000
Ba-142	10.600 m	1.89	2.9843E+22	8.7904E+08	1.0400	0.3780	0.0000
Te-134	41.800 m	1.91	1.0295E+23	7.6903E+08	0.8580	0.2430	0.0000
Te-133	12.450 m	2.41	3.0392E+22	7.6220E+08	0.9540	0.7970	0.0000
Tc-102	5.2800 s	2.84	2.1228E+20	7.5318E+08	0.0786	1.9400	0.0000
Sr-93	7.4230 m	0.32	1.7882E+22	7.5214E+08	2.2200	0.7870	0.0000
Mo-102	11.300 m	1.77	2.7046E+22	7.4732E+08	0.0189	0.3510	0.0000
Cs-138	33.420 m	0.54	7.8200E+22	7.3059E+08	2.3600	1.2400	0.0000
Ce-146	13.520 m	0.96	2.2159E+22	5.1173E+08	0.2890	0.0431	0.0000
Sb-131	23.030 m	0.17	3.5560E+22	4.8210E+08	1.8100	0.5820	0.0000
Tc-104	18.300 m	1.64	2.4162E+22	4.1225E+08	2.0000	1.6100	0.0000
Pr-146	24.150 m	0.75	3.1665E+22	4.0939E+08	1.0200	1.3000	0.0000
Pr-147	13.400 m	2.98	1.7157E+22	3.9978E+08	0.8640	0.7810	0.0000
Ba-139	1.3840 h	0.34	1.0170E+23	3.8237E+08	0.0454	0.8990	0.0000
I-134	52.500 m	0.38	5.7654E+22	3.4288E+08	2.6100	0.0618	0.0000
La-142	1.5180 h	0.55	8.5680E+22	2.9372E+08	2.4900	0.8420	0.0000
Te-131	25.000 m	0.40	2.2226E+22	2.7758E+08	0.4220	0.7210	0.0000
Te-133m	55.400 m	0.72	4.1512E+22	2.3396E+08	1.6960	0.6000	0.0000
Sr-92	2.7100 h	0.37	1.1979E+23	2.3002E+08	1.3410	0.1770	0.0000
Xe-137	3.8180 m	0.34	2.7368E+21	2.2381E+08	0.1960	1.7030	0.0000
Tc-105	7.6000 m	1.32	4.7865E+21	1.9664E+08	0.5390	1.4300	0.0000
Kr-87	1.2720 h	0.79	4.7347E+22	1.9370E+08	0.7960	1.3380	0.0000
Y-93m	0.82000 s	4.88	8.2524E+18	1.8853E+08	0.8600	0.0790	0.0000
Sb-130	39.500 m	2.03	2.0251E+22	1.6007E+08	3.2700	0.7030	0.0000
Br-84	31.800 m	0.25	1.4742E+22	1.4474E+08	1.7680	1.2360	0.0000
Kr-88	2.8390 h	1.06	6.9805E+22	1.2795E+08	1.9550	0.3616	0.0000
I-135	6.5690 h	0.30	1.3837E+23	1.0962E+08	1.6500	0.3770	0.0000
La-141	3.9190 h	0.77	7.1850E+22	9.5405E+07	1.4500	0.9626	0.0000
Rb-88	17.800 m	0.56	4.8315E+21	8.4749E+07	0.6370	2.0700	0.0000
Rh-107	21.700 m	1.84	5.4918E+21	7.9018E+07	0.3125	0.4370	0.0000
Nd-151	12.440 m	0.56	3.0241E+21	7.5900E+07	0.9170	0.6200	0.0000
Sb-130m	6.3000 m	3.17	1.4999E+21	7.4334E+07	2.6500	1.0100	0.0000
Kr-89	3.1500 m	1.27	7.4456E+20	7.3800E+07	1.8460	1.3780	0.0000
Pr-145	5.9830 h	0.17	8.2643E+22	7.1880E+07	0.0159	0.6770	0.0000
Pm-152	4.1200 m	1.94	8.9421E+20	6.7767E+07	0.2800	1.3100	0.0000
Sr-91	9.6310 h	0.52	1.2473E+23	6.7396E+07	1.0480	0.6670	0.0000
Rb-90m	4.3000 m	1.55	9.1847E+20	6.6691E+07	3.3000	1.4030	0.0000
Sb-132m	4.1000 m	1.71	8.6887E+20	6.6167E+07	2.5900	1.3400	0.0000
Nd-149	1.7280 h	0.06	2.1765E+22	6.5543E+07	0.3850	0.5040	0.0000
Ce-145	2.9500 m	2.03	6.0814E+20	6.4366E+07	0.7740	0.6910	0.0000
Y-93	10.180 h	0.79	1.1997E+23	6.1327E+07	0.0919	1.1720	0.0000
Sn-128	59.100 m	0.85	9.1781E+21	4.8488E+07	0.6020	0.2520	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 791
Total activity (Ci) = 2.16534E+10

Total number of decays = 7.48410E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 46.132
Average chain length = 3.5476

Average gamma E (MeV) = 1.0493
Average beta E (MeV) = 0.92852
Average alpha E (MeV) = 1.52495E-22

Composite Exposure Rate Conversion Factor = 18.8541317 R/hr per Ci/m2
Composite ECF per FGR table = 15.2456980 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.1163177 Rem/hr per Ci/m2

Fission Product Source

Point in time = 27.1880074 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Y-94	18.700 m	0.53	5.4730E+22	9.1381E+08	0.7780	1.8130	0.0000
Tc-101	14.200 m	0.70	4.1145E+22	9.0469E+08	0.3387	0.4770	0.0000
Ba-141	18.270 m	0.38	4.8572E+22	8.3009E+08	0.8470	0.9670	0.0000
Xe-138	14.080 m	0.57	3.5670E+22	7.9100E+08	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	3.4080E+22	7.5252E+08	0.2515	1.5000	0.0000
Cs-138	33.420 m	0.54	8.0185E+22	7.4914E+08	2.3600	1.2400	0.0000
Y-95	10.300 m	0.97	2.3873E+22	7.2368E+08	1.2910	1.3520	0.0000
Rb-89	15.400 m	1.30	3.5158E+22	7.1282E+08	2.0700	1.0200	0.0000
Te-134	41.800 m	1.91	9.4108E+22	7.0294E+08	0.8580	0.2430	0.0000
Mo-101	14.610 m	0.21	3.2744E+22	6.9977E+08	1.5100	0.5120	0.0000
Cs-139	9.2700 m	0.54	1.9600E+22	6.6018E+08	0.3290	1.6500	0.0000
Ba-142	10.600 m	1.89	2.0939E+22	6.1678E+08	1.0400	0.3780	0.0000
Te-133	12.450 m	2.41	2.2941E+22	5.7532E+08	0.9540	0.7970	0.0000
Tc-102	5.2800 s	2.84	1.5225E+20	5.4020E+08	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	1.9398E+22	5.3599E+08	0.0189	0.3510	0.0000
Sr-93	7.4230 m	0.32	1.0781E+22	4.5348E+08	2.2200	0.7870	0.0000
Pr-146	24.150 m	0.75	3.2064E+22	4.1454E+08	1.0200	1.3000	0.0000
Sb-131	23.030 m	0.17	3.0209E+22	4.0955E+08	1.8100	0.5820	0.0000
Ba-139	1.3840 h	0.34	1.0676E+23	4.0140E+08	0.0454	0.8990	0.0000
Ce-146	13.520 m	0.96	1.6784E+22	3.8761E+08	0.2890	0.0431	0.0000
I-134	52.500 m	0.38	6.2287E+22	3.7043E+08	2.6100	0.0618	0.0000
Tc-104	18.300 m	1.64	1.9679E+22	3.3576E+08	2.0000	1.6100	0.0000
La-142	1.5180 h	0.55	9.0930E+22	3.1172E+08	2.4900	0.8420	0.0000
Pr-147	13.400 m	2.98	1.2964E+22	3.0206E+08	0.8640	0.7810	0.0000
Te-131	25.000 m	0.40	2.3690E+22	2.9587E+08	0.4220	0.7210	0.0000
Sr-92	2.7100 h	0.37	1.1705E+23	2.2477E+08	1.3410	0.1770	0.0000
Te-133m	55.400 m	0.72	3.8804E+22	2.1869E+08	1.6960	0.6000	0.0000
Kr-87	1.2720 h	0.79	4.5074E+22	1.8440E+08	0.7960	1.3380	0.0000
Sb-130	39.500 m	2.03	1.8578E+22	1.4685E+08	3.2700	0.7030	0.0000
Br-84	31.800 m	0.25	1.3208E+22	1.2968E+08	1.7680	1.2360	0.0000
Kr-88	2.8390 h	1.06	6.8282E+22	1.2516E+08	1.9550	0.3616	0.0000
Tc-105	7.6000 m	1.32	2.9201E+21	1.1997E+08	0.5390	1.4300	0.0000
Y-93m	0.8200 s	4.88	4.9755E+18	1.1367E+08	0.8600	0.0790	0.0000
I-135	6.5690 h	0.30	1.3706E+23	1.0858E+08	1.6500	0.3770	0.0000
La-141	3.9190 h	0.77	8.1706E+22	1.0849E+08	1.4500	0.9626	0.0000
Rb-88	17.800 m	0.56	5.2843E+21	9.2691E+07	0.6370	2.0700	0.0000
Xe-137	3.8180 m	0.34	1.0234E+21	8.3688E+07	0.1960	1.7030	0.0000
Pr-145	5.9830 h	0.17	8.2218E+22	7.1510E+07	0.0159	0.6770	0.0000
Rh-107	21.700 m	1.84	4.7256E+21	6.7994E+07	0.3125	0.4370	0.0000
Sr-91	9.6310 h	0.52	1.2393E+23	6.6959E+07	1.0480	0.6670	0.0000
Y-93	10.180 h	0.79	1.2632E+23	6.4570E+07	0.0919	1.1720	0.0000
Nd-149	1.7280 h	0.06	2.1016E+22	6.3288E+07	0.3850	0.5040	0.0000
Nd-151	12.440 m	0.56	2.2360E+21	5.6121E+07	0.9170	0.6200	0.0000
Pm-152	4.1200 m	1.94	6.7356E+20	5.1045E+07	0.2800	1.3100	0.0000
Sn-128	59.100 m	0.85	8.6129E+21	4.5503E+07	0.6020	0.2520	0.0000
Zr-97	16.740 h	0.07	1.3463E+23	4.1852E+07	0.1800	0.7020	0.0000
Sb-130m	6.3000 m	3.17	8.2703E+20	4.0988E+07	2.6500	1.0100	0.0000
Se-83	22.300 m	1.35	2.9203E+21	4.0888E+07	2.4290	0.4976	0.0000
Nb-97m	52.700 s	3.42	1.1200E+20	3.9814E+07	0.7278	0.0156	0.0000
Xe-135m	15.290 m	0.33	1.9250E+21	3.9310E+07	0.4320	0.0984	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867373D+24
Difference in atom count = 1.13E+10
Fractional difference = 2.47E-15

Total number of nuclides = 777
Total activity (Ci) = 1.73796E+10

Total number of decays = 7.71726E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 47.569
Average chain length = 3.5476

Average gamma E (MeV) = 1.0636
Average beta E (MeV) = 0.90484
Average alpha E (MeV) = 1.90061E-22

Composite Exposure Rate Conversion Factor = 19.0840511 R/hr per Ci/m2
Composite ECF per FGR table = 16.4129829 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.2946072 Rem/hr per Ci/m2

Fission Product Source

Point in time = 33.9551735 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Tc-101	14.200 m	0.70	3.7161E+22	8.1709E+08	0.3387	0.4770	0.0000
Cs-138	33.420 m	0.54	7.9080E+22	7.3881E+08	2.3600	1.2400	0.0000
Y-94	18.700 m	0.53	4.2588E+22	7.1108E+08	0.7780	1.8130	0.0000
Ba-141	18.270 m	0.38	3.7574E+22	6.4213E+08	0.8470	0.9670	0.0000
Te-134	41.800 m	1.91	8.4118E+22	6.2833E+08	0.8580	0.2430	0.0000
Xe-138	14.080 m	0.57	2.5564E+22	5.6688E+08	1.1300	0.6390	0.0000
La-143	14.140 m	1.13	2.4458E+22	5.4007E+08	0.2515	1.5000	0.0000
Rb-89	15.400 m	1.30	2.6072E+22	5.2860E+08	2.0700	1.0200	0.0000
Mo-101	14.610 m	0.21	2.3752E+22	5.0760E+08	1.5100	0.5120	0.0000
Y-95	10.300 m	0.97	1.5140E+22	4.5895E+08	1.2910	1.3520	0.0000
Ba-139	1.3840 h	0.34	1.0844E+23	4.0774E+08	0.0454	0.8990	0.0000
Te-133	12.450 m	2.41	1.6209E+22	4.0651E+08	0.9540	0.7970	0.0000
Pr-146	24.150 m	0.75	3.0851E+22	3.9886E+08	1.0200	1.3000	0.0000
Cs-139	9.2700 m	0.54	1.1817E+22	3.9802E+08	0.3290	1.6500	0.0000
Ba-142	10.600 m	1.89	1.3452E+22	3.9623E+08	1.0400	0.3780	0.0000
I-134	52.500 m	0.38	6.6543E+22	3.9574E+08	2.6100	0.0618	0.0000
Tc-102	5.2800 s	2.84	1.0053E+20	3.5668E+08	0.0786	1.9400	0.0000
Mo-102	11.300 m	1.77	1.2808E+22	3.5390E+08	0.0189	0.3510	0.0000
Sb-131	23.030 m	0.17	2.4642E+22	3.3408E+08	1.8100	0.5820	0.0000
La-142	1.5180 h	0.55	9.3650E+22	3.2104E+08	2.4900	0.8420	0.0000
Te-131	25.000 m	0.40	2.4296E+22	3.0343E+08	0.4220	0.7210	0.0000
Ce-146	13.520 m	0.96	1.1864E+22	2.7398E+08	0.2890	0.0431	0.0000
Tc-104	18.300 m	1.64	1.5230E+22	2.5984E+08	2.0000	1.6100	0.0000
Sr-93	7.4230 m	0.32	5.7311E+21	2.4106E+08	2.2200	0.7870	0.0000
Sr-92	2.7100 h	0.37	1.1373E+23	2.1838E+08	1.3410	0.1770	0.0000
Pr-147	13.400 m	2.98	9.1349E+21	2.1285E+08	0.8640	0.7810	0.0000
Te-133m	55.400 m	0.72	3.5657E+22	2.0096E+08	1.6960	0.6000	0.0000
Kr-87	1.2720 h	0.79	4.2387E+22	1.7341E+08	0.7960	1.3380	0.0000
Sb-130	39.500 m	2.03	1.6564E+22	1.3093E+08	3.2700	0.7030	0.0000
Kr-88	2.8390 h	1.06	6.6428E+22	1.2176E+08	1.9550	0.3616	0.0000
La-141	3.9190 h	0.77	9.0977E+22	1.2080E+08	1.4500	0.9626	0.0000
Br-84	31.800 m	0.25	1.1432E+22	1.1224E+08	1.7680	1.2360	0.0000
I-135	6.5690 h	0.30	1.3544E+23	1.0729E+08	1.6500	0.3770	0.0000
Rb-88	17.800 m	0.56	5.6895E+21	9.9800E+07	0.6370	2.0700	0.0000
Pr-145	5.9830 h	0.17	8.1285E+22	7.0699E+07	0.0159	0.6770	0.0000
Y-93	10.180 h	0.79	1.3038E+23	6.6648E+07	0.0919	1.1720	0.0000
Sr-91	9.6310 h	0.52	1.2292E+23	6.6418E+07	1.0480	0.6670	0.0000
Tc-105	7.6000 m	1.32	1.5753E+21	6.4716E+07	0.5390	1.4300	0.0000
Nd-149	1.7280 h	0.06	2.0091E+22	6.0504E+07	0.3850	0.5040	0.0000
Y-93m	0.8200 s	4.88	2.6449E+18	6.0425E+07	0.8600	0.0790	0.0000
Rh-107	21.700 m	1.84	3.8499E+21	5.5394E+07	0.3125	0.4370	0.0000
Sn-128	59.100 m	0.85	7.9558E+21	4.2031E+07	0.6020	0.2520	0.0000
Zr-97	16.740 h	0.07	1.3400E+23	4.1657E+07	0.1800	0.7020	0.0000
Nb-97m	52.700 s	3.42	1.1148E+20	3.9628E+07	0.7278	0.0156	0.0000
Nd-151	12.440 m	0.56	1.5336E+21	3.8492E+07	0.9170	0.6200	0.0000
Pm-152	4.1200 m	1.94	4.5950E+20	3.4823E+07	0.2800	1.3100	0.0000
Kr-85m	4.4810 h	0.18	2.9862E+22	3.4679E+07	0.1570	0.2282	0.0000
Ru-105	4.4390 h	0.45	2.8721E+22	3.3670E+07	0.7380	0.4104	0.0000
Xe-135m	15.290 m	0.33	1.6469E+21	3.3631E+07	0.4320	0.0984	0.0000
Se-83	22.300 m	1.35	2.3663E+21	3.3132E+07	2.4290	0.4976	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 767
Total activity (Ci) = 1.37136E+10

Total number of decays = 7.94908E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 48.998
Average chain length = 3.5476

Average gamma E (MeV) = 1.0879
Average beta E (MeV) = 0.88055
Average alpha E (MeV) = 2.41005E-22

Composite Exposure Rate Conversion Factor = 19.4588566 R/hr per Ci/m2
Composite ECF per FGR table = 17.5319691 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.5991907 Rem/hr per Ci/m2

Fission Product Source

Point in time = 42.4066658 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-138	33.420 m	0.54	7.4299E+22	6.9414E+08	2.3600	1.2400	0.0000
Tc-101	14.200 m	0.70	3.0940E+22	6.8031E+08	0.3387	0.4770	0.0000
Te-134	41.800 m	1.91	7.3118E+22	5.4616E+08	0.8580	0.2430	0.0000
Y-94	18.700 m	0.53	3.1134E+22	5.1984E+08	0.7780	1.8130	0.0000
Ba-141	18.270 m	0.38	2.7267E+22	4.6598E+08	0.8470	0.9670	0.0000
I-134	52.500 m	0.38	6.9921E+22	4.1584E+08	2.6100	0.0618	0.0000
Ba-139	1.3840 h	0.34	1.0638E+23	3.9999E+08	0.0454	0.8990	0.0000
Xe-138	14.080 m	0.57	1.6863E+22	3.7394E+08	1.1300	0.6390	0.0000
Rb-89	15.400 m	1.30	1.7857E+22	3.6203E+08	2.0700	1.0200	0.0000
Pr-146	24.150 m	0.75	2.7878E+22	3.6042E+08	1.0200	1.3000	0.0000
La-143	14.140 m	1.13	1.6162E+22	3.5688E+08	0.2515	1.5000	0.0000
Mo-101	14.610 m	0.21	1.5906E+22	3.3992E+08	1.5100	0.5120	0.0000
La-142	1.5180 h	0.55	9.3332E+22	3.1995E+08	2.4900	0.8420	0.0000
Te-131	25.000 m	0.40	2.3742E+22	2.9652E+08	0.4220	0.7210	0.0000
Te-133	12.450 m	2.41	1.0625E+22	2.6645E+08	0.9540	0.7970	0.0000
Y-95	10.300 m	0.97	8.5729E+21	2.5988E+08	1.2910	1.3520	0.0000
Sb-131	23.030 m	0.17	1.9108E+22	2.5905E+08	1.8100	0.5820	0.0000
Ba-142	10.600 m	1.89	7.7404E+21	2.2800E+08	1.0400	0.3780	0.0000
Tc-102	5.2800 s	2.84	5.9860E+19	2.1239E+08	0.0786	1.9400	0.0000
Cs-139	9.2700 m	0.54	6.2815E+21	2.1157E+08	0.3290	1.6500	0.0000
Mo-102	11.300 m	1.77	7.6268E+21	2.1073E+08	0.0189	0.3510	0.0000
Sr-92	2.7100 h	0.37	1.0970E+23	2.1065E+08	1.3410	0.1770	0.0000
Tc-104	18.300 m	1.64	1.1058E+22	1.8866E+08	2.0000	1.6100	0.0000
Te-133m	55.400 m	0.72	3.2079E+22	1.8080E+08	1.6960	0.6000	0.0000
Ce-146	13.520 m	0.96	7.6922E+21	1.7764E+08	0.2890	0.0431	0.0000
Kr-87	1.2720 h	0.79	3.9255E+22	1.6059E+08	0.7960	1.3380	0.0000
Pr-147	13.400 m	2.98	5.8999E+21	1.3747E+08	0.8640	0.7810	0.0000
La-141	3.9190 h	0.77	9.8912E+22	1.3134E+08	1.4500	0.9626	0.0000
Kr-88	2.8390 h	1.06	6.4182E+22	1.1764E+08	1.9550	0.3616	0.0000
Sb-130	39.500 m	2.03	1.4301E+22	1.1305E+08	3.2700	0.7030	0.0000
Sr-93	7.4230 m	0.32	2.6031E+21	1.0949E+08	2.2200	0.7870	0.0000
I-135	6.5690 h	0.30	1.3344E+23	1.0571E+08	1.6500	0.3770	0.0000
Rb-88	17.800 m	0.56	6.0057E+21	1.0535E+08	0.6370	2.0700	0.0000
Br-84	31.800 m	0.25	9.5167E+21	9.3439E+07	1.7680	1.2360	0.0000
Pr-145	5.9830 h	0.17	7.9999E+22	6.9580E+07	0.0159	0.6770	0.0000
Y-93	10.180 h	0.79	1.3225E+23	6.7603E+07	0.0919	1.1720	0.0000
Sr-91	9.6310 h	0.52	1.2168E+23	6.5748E+07	1.0480	0.6670	0.0000
Nd-149	1.7280 h	0.06	1.8988E+22	5.7182E+07	0.3850	0.5040	0.0000
Rh-107	21.700 m	1.84	2.9521E+21	4.2477E+07	0.3125	0.4370	0.0000
Zr-97	16.740 h	0.07	1.3322E+23	4.1414E+07	0.1800	0.7020	0.0000
Nb-97m	52.700 s	3.42	1.1083E+20	3.9398E+07	0.7278	0.0156	0.0000
Sn-128	59.100 m	0.85	7.2050E+21	3.8064E+07	0.6020	0.2520	0.0000
Kr-85m	4.4810 h	0.18	2.9229E+22	3.3943E+07	0.1570	0.2282	0.0000
Ru-105	4.4390 h	0.45	2.8933E+22	3.3918E+07	0.7380	0.4104	0.0000
Tc-105	7.6000 m	1.32	7.2878E+20	2.9940E+07	0.5390	1.4300	0.0000
Y-92	3.5390 h	0.57	2.0289E+22	2.9833E+07	0.2570	1.4300	0.0000
Xe-135m	15.290 m	0.33	1.3967E+21	2.8521E+07	0.4320	0.0984	0.0000
Y-93m	0.82000 s	4.88	1.2013E+18	2.7446E+07	0.8600	0.0790	0.0000
I-133	20.800 h	0.48	1.0881E+23	2.7222E+07	0.6080	0.4100	0.0000
Se-83	22.300 m	1.35	1.8197E+21	2.5478E+07	2.4290	0.4976	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 757
Total activity (Ci) = 1.06153E+10

Total number of decays = 8.17536E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 50.393
Average chain length = 3.5476

Average gamma E (MeV) = 1.1221
Average beta E (MeV) = 0.85362
Average alpha E (MeV) = 3.11637E-22

Composite Exposure Rate Conversion Factor = 19.9782543 R/hr per Ci/m2
Composite ECF per FGR table = 18.6309204 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.0266972 Rem/hr per Ci/m2

Fission Product Source

Point in time = 52.9617386 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Cs-138	33.420 m 0.54	6.5770E+22	6.1446E+08	2.3600	1.2400	0.0000	0.0000
Tc-101	14.200 m 0.70	2.3275E+22	5.1177E+08	0.3387	0.4770	0.0000	0.0000
Te-134	41.800 m 1.91	6.1378E+22	4.5847E+08	0.8580	0.2430	0.0000	0.0000
I-134	52.500 m 0.38	7.1764E+22	4.2680E+08	2.6100	0.0618	0.0000	0.0000
Ba-139	1.3840 h 0.34	1.0067E+23	3.7853E+08	0.0454	0.8990	0.0000	0.0000
Y-94	18.700 m 0.53	2.1054E+22	3.5152E+08	0.7780	1.8130	0.0000	0.0000
Ba-141	18.270 m 0.38	1.8269E+22	3.1222E+08	0.8470	0.9670	0.0000	0.0000
La-142	1.5180 h 0.55	8.9819E+22	3.0790E+08	2.4900	0.8420	0.0000	0.0000
Pr-146	24.150 m 0.75	2.3327E+22	3.0159E+08	1.0200	1.3000	0.0000	0.0000
Te-131	25.000 m 0.40	2.1841E+22	2.7277E+08	0.4220	0.7210	0.0000	0.0000
Rb-89	15.400 m 1.30	1.1109E+22	2.2523E+08	2.0700	1.0200	0.0000	0.0000
Xe-138	14.080 m 0.57	1.0029E+22	2.2240E+08	1.1300	0.6390	0.0000	0.0000
La-143	14.140 m 1.13	9.6337E+21	2.1272E+08	0.2515	1.5000	0.0000	0.0000
Mo-101	14.610 m 0.21	9.6400E+21	2.0602E+08	1.5100	0.5120	0.0000	0.0000
Sr-92	2.7100 h 0.37	1.0487E+23	2.0138E+08	1.3410	0.1770	0.0000	0.0000
Sb-131	23.030 m 0.17	1.3907E+22	1.8855E+08	1.8100	0.5820	0.0000	0.0000
Te-133	12.450 m 2.41	6.4254E+21	1.6114E+08	0.9540	0.7970	0.0000	0.0000
Te-133m	55.400 m 0.72	2.8111E+22	1.5843E+08	1.6960	0.6000	0.0000	0.0000
Kr-87	1.2720 h 0.79	3.5667E+22	1.4591E+08	0.7960	1.3380	0.0000	0.0000
La-141	3.9190 h 0.77	1.0473E+23	1.3907E+08	1.4500	0.9626	0.0000	0.0000
Y-95	10.300 m 0.97	4.2135E+21	1.2773E+08	1.2910	1.3520	0.0000	0.0000
Tc-104	18.300 m 1.64	7.4137E+21	1.2649E+08	2.0000	1.6100	0.0000	0.0000
Ba-142	10.600 m 1.89	3.8816E+21	1.1433E+08	1.0400	0.3780	0.0000	0.0000
Kr-88	2.8390 h 1.06	6.1484E+22	1.1270E+08	1.9550	0.3616	0.0000	0.0000
Tc-102	5.2800 s 2.84	3.1330E+19	1.1116E+08	0.0786	1.9400	0.0000	0.0000
Mo-102	11.300 m 1.77	3.9917E+21	1.1029E+08	0.0189	0.3510	0.0000	0.0000
Rb-88	17.800 m 0.56	6.1909E+21	1.0859E+08	0.6370	2.0700	0.0000	0.0000
I-135	6.5690 h 0.30	1.3099E+23	1.0377E+08	1.6500	0.3770	0.0000	0.0000
Ce-146	13.520 m 0.96	4.4775E+21	1.0340E+08	0.2890	0.0431	0.0000	0.0000
Cs-139	9.2700 m 0.54	2.8530E+21	9.6094E+07	0.3290	1.6500	0.0000	0.0000
Sb-130	39.500 m 2.03	1.1888E+22	9.3967E+07	3.2700	0.7030	0.0000	0.0000
Pr-147	13.400 m 2.98	3.4176E+21	7.9632E+07	0.8640	0.7810	0.0000	0.0000
Br-84	31.800 m 0.25	7.5621E+21	7.4248E+07	1.7680	1.2360	0.0000	0.0000
Pr-145	5.9830 h 0.17	7.8389E+22	6.8180E+07	0.0159	0.6770	0.0000	0.0000
Y-93	10.180 h 0.79	1.3230E+23	6.7627E+07	0.0919	1.1720	0.0000	0.0000
Sr-91	9.6310 h 0.52	1.2015E+23	6.4921E+07	1.0480	0.6670	0.0000	0.0000
Nd-149	1.7280 h 0.06	1.7694E+22	5.3286E+07	0.3850	0.5040	0.0000	0.0000
Zr-97	16.740 h 0.07	1.3226E+23	4.1114E+07	0.1800	0.7020	0.0000	0.0000
Sr-93	7.4230 m 0.32	9.7151E+20	4.0864E+07	2.2200	0.7870	0.0000	0.0000
Nb-97m	52.700 s 3.42	1.1003E+20	3.9112E+07	0.7278	0.0156	0.0000	0.0000
Y-92	3.5390 h 0.57	2.4345E+22	3.5798E+07	0.2570	1.4300	0.0000	0.0000
Sn-128	59.100 m 0.85	6.3661E+21	3.3632E+07	0.6020	0.2520	0.0000	0.0000
Ru-105	4.4390 h 0.45	2.8592E+22	3.3518E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810 h 0.18	2.8445E+22	3.3034E+07	0.1570	0.2282	0.0000	0.0000
Rh-107	21.700 m 1.84	2.1101E+21	3.0361E+07	0.3125	0.4370	0.0000	0.0000
I-133	20.800 h 0.48	1.1632E+23	2.9100E+07	0.6080	0.4100	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.1873E+21	2.4246E+07	0.4320	0.0984	0.0000	0.0000
Br-83	2.4000 h 0.83	9.7996E+21	2.1248E+07	0.0065	0.3249	0.0000	0.0000
Y-91m	49.720 m 0.08	3.2088E+21	2.0150E+07	0.5283	0.0279	0.0000	0.0000
Sb-129	4.3610 h 0.69	1.6659E+22	1.9878E+07	1.3600	0.3940	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 744
Total activity (Ci) = 8.07754E+09

Total number of decays = 8.39218E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 51.729
Average chain length = 3.5476

Average gamma E (MeV) = 1.1639
Average beta E (MeV) = 0.82260
Average alpha E (MeV) = 4.10171E-22

Composite Exposure Rate Conversion Factor = 20.6114578 R/hr per Ci/m2
Composite ECF per FGR table = 19.6925678 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.5492392 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.10240090 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Cs-138	33.420	m	0.54	5.4165E+22	5.0604E+08	2.3600	1.2400	0.0000
I-134	52.500	m	0.38	7.1327E+22	4.2420E+08	2.6100	0.0618	0.0000
Te-134	41.800	m	1.91	4.9326E+22	3.6844E+08	0.8580	0.2430	0.0000
Ba-139	1.3840	h	0.34	9.1861E+22	3.4540E+08	0.0454	0.8990	0.0000
Tc-101	14.200	m	0.70	1.5427E+22	3.3921E+08	0.3387	0.4770	0.0000
La-142	1.5180	h	0.55	8.3363E+22	2.8578E+08	2.4900	0.8420	0.0000
Te-131	25.000	m	0.40	1.8630E+22	2.3268E+08	0.4220	0.7210	0.0000
Pr-146	24.150	m	0.75	1.7772E+22	2.2977E+08	1.0200	1.3000	0.0000
Y-94	18.700	m	0.53	1.2916E+22	2.1565E+08	0.7780	1.8130	0.0000
Sr-92	2.7100	h	0.37	9.9143E+22	1.9038E+08	1.3410	0.1770	0.0000
Ba-141	18.270	m	0.38	1.1080E+22	1.8935E+08	0.8470	0.9670	0.0000
La-141	3.9190	h	0.77	1.0778E+23	1.4311E+08	1.4500	0.9626	0.0000
Te-133m	55.400	m	0.72	2.3836E+22	1.3434E+08	1.6960	0.6000	0.0000
Kr-87	1.2720	h	0.79	3.1642E+22	1.2945E+08	0.7960	1.3380	0.0000
Sb-131	23.030	m	0.17	9.3526E+21	1.2680E+08	1.8100	0.5820	0.0000
Rb-89	15.400	m	1.30	6.1381E+21	1.2445E+08	2.0700	1.0200	0.0000
Xe-138	14.080	m	0.57	5.2411E+21	1.1622E+08	1.1300	0.6390	0.0000
La-143	14.140	m	1.13	5.0484E+21	1.1147E+08	0.2515	1.5000	0.0000
Mo-101	14.610	m	0.21	5.1578E+21	1.1023E+08	1.5100	0.5120	0.0000
Rb-88	17.800	m	0.56	6.2111E+21	1.0895E+08	0.6370	2.0700	0.0000
Kr-88	2.8390	h	1.06	5.8273E+22	1.0681E+08	1.9550	0.3616	0.0000
I-135	6.5690	h	0.30	1.2799E+23	1.0139E+08	1.6500	0.3770	0.0000
Te-133	12.450	m	2.41	3.6090E+21	9.0509E+07	0.9540	0.7970	0.0000
Tc-104	18.300	m	1.64	4.4997E+21	7.6773E+07	2.0000	1.6100	0.0000
Sb-130	39.500	m	2.03	9.4334E+21	7.4566E+07	3.2700	0.7030	0.0000
Y-93	10.180	h	0.79	1.3101E+23	6.6971E+07	0.0919	1.1720	0.0000
Pr-145	5.9830	h	0.17	7.6420E+22	6.6467E+07	0.0159	0.6770	0.0000
Sr-91	9.6310	h	0.52	1.1827E+23	6.3902E+07	1.0480	0.6670	0.0000
Br-84	31.800	m	0.25	5.6736E+21	5.5707E+07	1.7680	1.2360	0.0000
Ce-146	13.520	m	0.96	2.2778E+21	5.2604E+07	0.2890	0.0431	0.0000
Y-95	10.300	m	0.97	1.7353E+21	5.2603E+07	1.2910	1.3520	0.0000
Tc-102	5.2800	s	2.84	1.3957E+19	4.9519E+07	0.0786	1.9400	0.0000
Mo-102	11.300	m	1.77	1.7782E+21	4.9133E+07	0.0189	0.3510	0.0000
Nd-149	1.7280	h	0.06	1.6202E+22	4.8791E+07	0.3850	0.5040	0.0000
Ba-142	10.600	m	1.89	1.6393E+21	4.8285E+07	1.0400	0.3780	0.0000
Y-92	3.5390	h	0.57	2.8928E+22	4.2536E+07	0.2570	1.4300	0.0000
Zr-97	16.740	h	0.07	1.3106E+23	4.0741E+07	0.1800	0.7020	0.0000
Pr-147	13.400	m	2.98	1.7282E+21	4.0267E+07	0.8640	0.7810	0.0000
Nb-97m	52.700	s	3.42	1.0903E+20	3.8758E+07	0.7278	0.0156	0.0000
Cs-139	9.2700	m	0.54	1.0647E+21	3.5861E+07	0.3290	1.6500	0.0000
Ru-105	4.4390	h	0.45	2.7819E+22	3.2612E+07	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	2.7495E+22	3.1930E+07	0.1570	0.2282	0.0000
I-133	20.800	h	0.48	1.2253E+23	3.0655E+07	0.6080	0.4100	0.0000
Sn-128	59.100	m	0.85	5.4541E+21	2.8814E+07	0.6020	0.2520	0.0000
Y-91m	49.720	m	0.08	3.6830E+21	2.3128E+07	0.5283	0.0279	0.0000
Xe-135m	15.290	m	0.33	1.0258E+21	2.0948E+07	0.4320	0.0984	0.0000
Br-83	2.4000	h	0.83	9.6231E+21	2.0865E+07	0.0065	0.3249	0.0000
Nb-97	1.2020	h	0.97	4.6182E+21	1.9993E+07	0.6670	0.4671	0.0000
Rh-107	21.700	m	1.84	1.3853E+21	1.9933E+07	0.3125	0.4370	0.0000
Sb-129	4.3610	h	0.69	1.6122E+22	1.9237E+07	1.3600	0.3940	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 733
Total activity (Ci) = 6.08143E+09

Total number of decays = 8.59701E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 52.992
Average chain length = 3.5476

Average gamma E (MeV) = 1.2074
Average beta E (MeV) = 0.78720
Average alpha E (MeV) = 5.46166E-22

Composite Exposure Rate Conversion Factor = 21.2675953 R/hr per Ci/m2
Composite ECF per FGR table = 20.6331787 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.0921593 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.37679005 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
I-134	52.500	m	0.38	6.7932E+22	4.0401E+08	2.6100	0.0618	0.0000
Cs-138	33.420	m	0.54	4.0907E+22	3.8217E+08	2.3600	1.2400	0.0000
Ba-139	1.3840	h	0.34	8.0761E+22	3.0366E+08	0.0454	0.8990	0.0000
Te-134	41.800	m	1.91	3.7542E+22	2.8042E+08	0.8580	0.2430	0.0000
La-142	1.5180	h	0.55	7.4551E+22	2.5557E+08	2.4900	0.8420	0.0000
Tc-101	14.200	m	0.70	8.7309E+21	1.9197E+08	0.3387	0.4770	0.0000
Te-131	25.000	m	0.40	1.4462E+22	1.8062E+08	0.4220	0.7210	0.0000
Sr-92	2.7100	h	0.37	9.2424E+22	1.7747E+08	1.3410	0.1770	0.0000
Pr-146	24.150	m	0.75	1.2081E+22	1.5619E+08	1.0200	1.3000	0.0000
La-141	3.9190	h	0.77	1.0769E+23	1.4299E+08	1.4500	0.9626	0.0000
Y-94	18.700	m	0.53	7.0161E+21	1.1715E+08	0.7780	1.8130	0.0000
Kr-87	1.2720	h	0.79	2.7248E+22	1.1147E+08	0.7960	1.3380	0.0000
Te-133m	55.400	m	0.72	1.9399E+22	1.0933E+08	1.6960	0.6000	0.0000
Rb-88	17.800	m	0.56	6.0492E+21	1.0611E+08	0.6370	2.0700	0.0000
Ba-141	18.270	m	0.38	5.9328E+21	1.0139E+08	0.8470	0.9670	0.0000
Kr-88	2.8390	h	1.06	5.4497E+22	9.9891E+07	1.9550	0.3616	0.0000
I-135	6.5690	h	0.30	1.2433E+23	9.8495E+07	1.6500	0.3770	0.0000
Sb-131	23.030	m	0.17	5.6982E+21	7.7253E+07	1.8100	0.5820	0.0000
Y-93	10.180	h	0.79	1.2881E+23	6.5844E+07	0.0919	1.1720	0.0000
Pr-145	5.9830	h	0.17	7.4029E+22	6.4387E+07	0.0159	0.6770	0.0000
Sr-91	9.6310	h	0.52	1.1595E+23	6.2653E+07	1.0480	0.6670	0.0000
Rb-89	15.400	m	1.30	2.9256E+21	5.9316E+07	2.0700	1.0200	0.0000
Sb-130	39.500	m	2.03	7.0665E+21	5.5857E+07	3.2700	0.7030	0.0000
Xe-138	14.080	m	0.57	2.3304E+21	5.1678E+07	1.1300	0.6390	0.0000
Mo-101	14.610	m	0.21	2.3618E+21	5.0474E+07	1.5100	0.5120	0.0000
Y-92	3.5390	h	0.57	3.3954E+22	4.9927E+07	0.2570	1.4300	0.0000
La-143	14.140	m	1.13	2.2525E+21	4.9737E+07	0.2515	1.5000	0.0000
Te-133	12.450	m	2.41	1.9437E+21	4.8746E+07	0.9540	0.7970	0.0000
Nd-149	1.7280	h	0.06	1.4513E+22	4.3706E+07	0.3850	0.5040	0.0000
Tc-104	18.300	m	1.64	2.4120E+21	4.1152E+07	2.0000	1.6100	0.0000
Zr-97	16.740	h	0.07	1.2958E+23	4.0281E+07	0.1800	0.7020	0.0000
Br-84	31.800	m	0.25	3.9629E+21	3.8910E+07	1.7680	1.2360	0.0000
Nb-97m	52.700	s	3.42	1.0780E+20	3.8320E+07	0.7278	0.0156	0.0000
I-133	20.800	h	0.48	1.2749E+23	3.1896E+07	0.6080	0.4100	0.0000
Ru-105	4.4390	h	0.45	2.6715E+22	3.1318E+07	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	2.6352E+22	3.0603E+07	0.1570	0.2282	0.0000
Y-91m	49.720	m	0.08	4.1431E+21	2.6018E+07	0.5283	0.0279	0.0000
Sn-128	59.100	m	0.85	4.4964E+21	2.3755E+07	0.6020	0.2520	0.0000
Nb-97	1.2020	h	0.97	5.3127E+21	2.3000E+07	0.6670	0.4671	0.0000
Ce-146	13.520	m	0.96	9.7939E+20	2.2618E+07	0.2890	0.0431	0.0000
Br-83	2.4000	h	0.83	9.2239E+21	2.0000E+07	0.0065	0.3249	0.0000
Ce-143	1.3800	d	0.15	1.2235E+23	1.9223E+07	0.2750	0.4390	0.0000
Xe-135m	15.290	m	0.33	9.1050E+20	1.8593E+07	0.4320	0.0984	0.0000
Sb-129	4.3610	h	0.69	1.5455E+22	1.8442E+07	1.3600	0.3940	0.0000
Tc-102	5.2800	s	2.84	5.0839E+18	1.8038E+07	0.0786	1.9400	0.0000
Mo-102	11.300	m	1.77	6.4774E+20	1.7898E+07	0.0189	0.3510	0.0000
Y-95	10.300	m	0.97	5.7308E+20	1.7372E+07	1.2910	1.3520	0.0000
Pr-147	13.400	m	2.98	7.3745E+20	1.7183E+07	0.8640	0.7810	0.0000
Ba-142	10.600	m	1.89	5.5860E+20	1.6454E+07	1.0400	0.3780	0.0000
Xe-135	9.1390	h	0.22	2.4146E+22	1.3749E+07	0.2490	0.3190	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 728
Total activity (Ci) = 4.57313E+09

Total number of decays = 8.78933E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 54.177
Average chain length = 3.5476

Average gamma E (MeV) = 1.2421
Average beta E (MeV) = 0.74881
Average alpha E (MeV) = 7.29267E-22

Composite Exposure Rate Conversion Factor = 21.7846584 R/hr per Ci/m2
Composite ECF per FGR table = 21.3020344 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.5260973 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.71947491 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
I-134	52.500 m 0.38	6.1208E+22	3.6402E+08	2.6100	0.0618	0.0000	0.0000
Cs-138	33.420 m 0.54	2.7870E+22	2.6038E+08	2.3600	1.2400	0.0000	0.0000
Ba-139	1.3840 h 0.34	6.8244E+22	2.5660E+08	0.0454	0.8990	0.0000	0.0000
La-142	1.5180 h 0.55	6.4128E+22	2.1984E+08	2.4900	0.8420	0.0000	0.0000
Te-134	41.800 m 1.91	2.6695E+22	1.9940E+08	0.8580	0.2430	0.0000	0.0000
Sr-92	2.7100 h 0.37	8.4668E+22	1.6258E+08	1.3410	0.1770	0.0000	0.0000
La-141	3.9190 h 0.77	1.0446E+23	1.3870E+08	1.4500	0.9626	0.0000	0.0000
Te-131	25.000 m 0.40	9.9813E+21	1.2466E+08	0.4220	0.7210	0.0000	0.0000
Rb-88	17.800 m 0.56	5.7096E+21	1.0015E+08	0.6370	2.0700	0.0000	0.0000
I-135	6.5690 h 0.30	1.1992E+23	9.4997E+07	1.6500	0.3770	0.0000	0.0000
Pr-146	24.150 m 0.75	7.1534E+21	9.2485E+07	1.0200	1.3000	0.0000	0.0000
Kr-87	1.2720 h 0.79	2.2607E+22	9.2484E+07	0.7960	1.3380	0.0000	0.0000
Kr-88	2.8390 h 1.06	5.0123E+22	9.1873E+07	1.9550	0.3616	0.0000	0.0000
Tc-101	14.200 m 0.70	4.0567E+21	8.9198E+07	0.3387	0.4770	0.0000	0.0000
Te-133m	55.400 m 0.72	1.4999E+22	8.4532E+07	1.6960	0.6000	0.0000	0.0000
Y-93	10.180 h 0.79	1.2589E+23	6.4352E+07	0.0919	1.1720	0.0000	0.0000
Pr-145	5.9830 h 0.17	7.1147E+22	6.1881E+07	0.0159	0.6770	0.0000	0.0000
Sr-91	9.6310 h 0.52	1.1313E+23	6.1126E+07	1.0480	0.6670	0.0000	0.0000
Y-92	3.5390 h 0.57	3.9248E+22	5.7711E+07	0.2570	1.4300	0.0000	0.0000
Y-94	18.700 m 0.53	3.2742E+21	5.4668E+07	0.7780	1.8130	0.0000	0.0000
Ba-141	18.270 m 0.38	2.7194E+21	4.6474E+07	0.8470	0.9670	0.0000	0.0000
Sb-131	23.030 m 0.17	3.0689E+21	4.1606E+07	1.8100	0.5820	0.0000	0.0000
Zr-97	16.740 h 0.07	1.2775E+23	3.9714E+07	0.1800	0.7020	0.0000	0.0000
Sb-130	39.500 m 2.03	4.9261E+21	3.8939E+07	3.2700	0.7030	0.0000	0.0000
Nd-149	1.7280 h 0.06	1.2649E+22	3.8093E+07	0.3850	0.5040	0.0000	0.0000
Nb-97m	52.700 s 3.42	1.0628E+20	3.7780E+07	0.7278	0.0156	0.0000	0.0000
I-133	20.800 h 0.48	1.3129E+23	3.2846E+07	0.6080	0.4100	0.0000	0.0000
Ru-105	4.4390 h 0.45	2.5338E+22	2.9704E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810 h 0.18	2.4992E+22	2.9023E+07	0.1570	0.2282	0.0000	0.0000
Y-91m	49.720 m 0.08	4.5549E+21	2.8603E+07	0.5283	0.0279	0.0000	0.0000
Te-133	12.450 m 2.41	1.0663E+21	2.6742E+07	0.9540	0.7970	0.0000	0.0000
Nb-97	1.2020 h 0.97	6.0176E+21	2.6052E+07	0.6670	0.4671	0.0000	0.0000
Br-84	31.800 m 0.25	2.5315E+21	2.4855E+07	1.7680	1.2360	0.0000	0.0000
Rb-89	15.400 m 1.30	1.1596E+21	2.3510E+07	2.0700	1.0200	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.2290E+23	1.9310E+07	0.2750	0.4390	0.0000	0.0000
Mo-101	14.610 m 0.21	8.9043E+20	1.9029E+07	1.5100	0.5120	0.0000	0.0000
Tc-104	18.300 m 1.64	1.1070E+21	1.8887E+07	2.0000	1.6100	0.0000	0.0000
Xe-138	14.080 m 0.57	8.4692E+20	1.8781E+07	1.1300	0.6390	0.0000	0.0000
Sn-128	59.100 m 0.85	3.5330E+21	1.8665E+07	0.6020	0.2520	0.0000	0.0000
Br-83	2.4000 h 0.83	8.5880E+21	1.8621E+07	0.0065	0.3249	0.0000	0.0000
La-143	14.140 m 1.13	8.2211E+20	1.8153E+07	0.2515	1.5000	0.0000	0.0000
Sb-129	4.3610 h 0.69	1.4648E+22	1.7479E+07	1.3600	0.3940	0.0000	0.0000
Xe-135m	15.290 m 0.33	8.3135E+20	1.6976E+07	0.4320	0.0984	0.0000	0.0000
Xe-135	9.1390 h 0.22	2.7958E+22	1.5920E+07	0.2490	0.3190	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.3367E+23	1.0547E+07	0.1450	0.4080	0.0000	0.0000
Te-129	1.1600 h 0.29	2.3094E+21	1.0360E+07	0.0631	0.5420	0.0000	0.0000
Kr-83m	1.8300 h 1.09	3.3137E+21	9.4228E+06	0.0026	0.0382	0.0000	0.0000
Rh-105m	40.000 s 0.00	1.8051E+19	8.4541E+06	0.0345	0.0948	0.0000	0.0000
Ce-146	13.520 m 0.96	3.4131E+20	7.8822E+06	0.2890	0.0431	0.0000	0.0000
Te-132	3.2040 d 0.41	1.0498E+23	7.1041E+06	0.2340	0.1020	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 718
Total activity (Ci) = 3.46767E+09

Total number of decays = 8.97056E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 55.294
Average chain length = 3.5476

Average gamma E (MeV) = 1.2555
Average beta E (MeV) = 0.71090
Average alpha E (MeV) = 9.68094E-22

Composite Exposure Rate Conversion Factor = 21.9634838 R/hr per Ci/m2
Composite ECF per FGR table = 21.5097256 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.6939631 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.14745688 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
I-134	52.500	m	0.38	5.1365E+22	3.0548E+08	2.6100	0.0618	0.0000
Ba-139	1.3840	h	0.34	5.5128E+22	2.0728E+08	0.0454	0.8990	0.0000
La-142	1.5180	h	0.55	5.2849E+22	1.8117E+08	2.4900	0.8420	0.0000
Cs-138	33.420	m	0.54	1.6808E+22	1.5703E+08	2.3600	1.2400	0.0000
Sr-92	2.7100	h	0.37	7.5889E+22	1.4572E+08	1.3410	0.1770	0.0000
La-141	3.9190	h	0.77	9.8464E+22	1.3074E+08	1.4500	0.9626	0.0000
Te-134	41.800	m	1.91	1.7438E+22	1.3026E+08	0.8580	0.2430	0.0000
Rb-88	17.800	m	0.56	5.2173E+21	9.1516E+07	0.6370	2.0700	0.0000
I-135	6.5690	h	0.30	1.1462E+23	9.0802E+07	1.6500	0.3770	0.0000
Kr-88	2.8390	h	1.06	4.5149E+22	8.2758E+07	1.9550	0.3616	0.0000
Te-131	25.000	m	0.40	5.9514E+21	7.4328E+07	0.4220	0.7210	0.0000
Kr-87	1.2720	h	0.79	1.7904E+22	7.3246E+07	0.7960	1.3380	0.0000
Y-92	3.5390	h	0.57	4.4507E+22	6.5444E+07	0.2570	1.4300	0.0000
Y-93	10.180	h	0.79	1.2228E+23	6.2508E+07	0.0919	1.1720	0.0000
Te-133m	55.400	m	0.72	1.0877E+22	6.1304E+07	1.6960	0.6000	0.0000
Sr-91	9.6310	h	0.52	1.0970E+23	5.9272E+07	1.0480	0.6670	0.0000
Pr-145	5.9830	h	0.17	6.7705E+22	5.8888E+07	0.0159	0.6770	0.0000
Pr-146	24.150	m	0.75	3.5864E+21	4.6367E+07	1.0200	1.3000	0.0000
Zr-97	16.740	h	0.07	1.2551E+23	3.9016E+07	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	1.0441E+20	3.7116E+07	0.7278	0.0156	0.0000
I-133	20.800	h	0.48	1.3396E+23	3.3514E+07	0.6080	0.4100	0.0000
Tc-101	14.200	m	0.70	1.4735E+21	3.2399E+07	0.3387	0.4770	0.0000
Nd-149	1.7280	h	0.06	1.0654E+22	3.2084E+07	0.3850	0.5040	0.0000
Y-91m	49.720	m	0.08	4.8799E+21	3.0644E+07	0.5283	0.0279	0.0000
Nb-97	1.2020	h	0.97	6.6910E+21	2.8967E+07	0.6670	0.4671	0.0000
Ru-105	4.4390	h	0.45	2.3703E+22	2.7787E+07	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	2.3391E+22	2.7164E+07	0.1570	0.2282	0.0000
Sb-130	39.500	m	2.03	3.1391E+21	2.4813E+07	3.2700	0.7030	0.0000
Y-94	18.700	m	0.53	1.2639E+21	2.1104E+07	0.7780	1.8130	0.0000
Ce-143	1.3800	d	0.15	1.2239E+23	1.9230E+07	0.2750	0.4390	0.0000
Sb-131	23.030	m	0.17	1.4168E+21	1.9209E+07	1.8100	0.5820	0.0000
Xe-135	9.1390	h	0.22	3.2326E+22	1.8406E+07	0.2490	0.3190	0.0000
Ba-141	18.270	m	0.38	1.0265E+21	1.7543E+07	0.8470	0.9670	0.0000
Br-83	2.4000	h	0.83	7.7306E+21	1.6762E+07	0.0065	0.3249	0.0000
Sb-129	4.3610	h	0.69	1.3691E+22	1.6337E+07	1.3600	0.3940	0.0000
Xe-135m	15.290	m	0.33	7.7385E+20	1.5802E+07	0.4320	0.0984	0.0000
Te-133	12.450	m	2.41	6.2491E+20	1.5672E+07	0.9540	0.7970	0.0000
Br-84	31.800	m	0.25	1.4464E+21	1.4202E+07	1.7680	1.2360	0.0000
Sn-128	59.100	m	0.85	2.6142E+21	1.3811E+07	0.6020	0.2520	0.0000
Te-129	1.1600	h	0.29	2.4976E+21	1.1204E+07	0.0631	0.5420	0.0000
Kr-83m	1.8300	h	1.09	3.7468E+21	1.0654E+07	0.0026	0.0382	0.0000
Mo-99	2.7480	d	0.02	1.3307E+23	1.0499E+07	0.1450	0.4080	0.0000
Rh-105m	40.000	s	0.00	1.6886E+19	7.9085E+06	0.0345	0.0948	0.0000
Rb-89	15.400	m	1.30	3.6505E+20	7.4011E+06	2.0700	1.0200	0.0000
Tc-104	18.300	m	1.64	4.1854E+20	7.1410E+06	2.0000	1.6100	0.0000
Te-132	3.2040	d	0.41	1.0457E+23	7.0768E+06	0.2340	0.1020	0.0000
Sn-127	2.1000	h	1.91	2.3500E+21	5.8232E+06	1.8600	0.5190	0.0000
Mo-101	14.610	m	0.21	2.6333E+20	5.6276E+06	1.5100	0.5120	0.0000
Xe-138	14.080	m	0.57	2.3924E+20	5.3052E+06	1.1300	0.6390	0.0000
La-143	14.140	m	1.13	2.3348E+20	5.1554E+06	0.2515	1.5000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 708
Total activity (Ci) = 2.66750E+09

Total number of decays = 9.14337E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 56.360
Average chain length = 3.5476

Average gamma E (MeV) = 1.2378
Average beta E (MeV) = 0.67868
Average alpha E (MeV) = 1.27177E-21

Composite Exposure Rate Conversion Factor = 21.6461143 R/hr per Ci/m2
Composite ECF per FGR table = 21.0949345 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 15.4719744 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.68196177 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
I-134	52.500 m 0.38	3.9389E+22	2.3426E+08	2.6100	0.0618	0.0000	0.0000
Ba-139	1.3840 h 0.34	4.2188E+22	1.5863E+08	0.0454	0.8990	0.0000	0.0000
La-142	1.5180 h 0.55	4.1424E+22	1.4201E+08	2.4900	0.8420	0.0000	0.0000
Sr-92	2.7100 h 0.37	6.6192E+22	1.2710E+08	1.3410	0.1770	0.0000	0.0000
La-141	3.9190 h 0.77	9.0265E+22	1.1986E+08	1.4500	0.9626	0.0000	0.0000
I-135	6.5690 h 0.30	1.0834E+23	8.5823E+07	1.6500	0.3770	0.0000	0.0000
Cs-138	33.420 m 0.54	8.7699E+21	8.1933E+07	2.3600	1.2400	0.0000	0.0000
Rb-88	17.800 m 0.56	4.6093E+21	8.0851E+07	0.6370	2.0700	0.0000	0.0000
Te-134	41.800 m 1.91	1.0246E+22	7.6532E+07	0.8580	0.2430	0.0000	0.0000
Kr-88	2.8390 h 1.06	3.9626E+22	7.2633E+07	1.9550	0.3616	0.0000	0.0000
Y-92	3.5390 h 0.57	4.9279E+22	7.2461E+07	0.2570	1.4300	0.0000	0.0000
Y-93	10.180 h 0.79	1.1791E+23	6.0274E+07	0.0919	1.1720	0.0000	0.0000
Sr-91	9.6310 h 0.52	1.0556E+23	5.7035E+07	1.0480	0.6670	0.0000	0.0000
Pr-145	5.9830 h 0.17	6.3640E+22	5.5352E+07	0.0159	0.6770	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.3380E+22	5.4738E+07	0.7960	1.3380	0.0000	0.0000
Te-133m	55.400 m 0.72	7.2822E+21	4.1042E+07	1.6960	0.6000	0.0000	0.0000
Zr-97	16.740 h 0.07	1.2276E+23	3.8162E+07	0.1800	0.7020	0.0000	0.0000
Te-131	25.000 m 0.40	2.9614E+21	3.6986E+07	0.4220	0.7210	0.0000	0.0000
Nb-97m	52.700 s 3.42	1.0213E+20	3.6304E+07	0.7278	0.0156	0.0000	0.0000
I-133	20.800 h 0.48	1.3539E+23	3.3873E+07	0.6080	0.4100	0.0000	0.0000
Y-91m	49.720 m 0.08	5.0820E+21	3.1913E+07	0.5283	0.0279	0.0000	0.0000
Nb-97	1.2020 h 0.97	7.2811E+21	3.1522E+07	0.6670	0.4671	0.0000	0.0000
Nd-149	1.7280 h 0.06	8.5979E+21	2.5892E+07	0.3850	0.5040	0.0000	0.0000
Ru-105	4.4390 h 0.45	2.1805E+22	2.5562E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810 h 0.18	2.1535E+22	2.5008E+07	0.1570	0.2282	0.0000	0.0000
Xe-135	9.1390 h 0.22	3.7243E+22	2.1206E+07	0.2490	0.3190	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.2121E+23	1.9044E+07	0.2750	0.4390	0.0000	0.0000
Pr-146	24.150 m 0.75	1.4712E+21	1.9021E+07	1.0200	1.3000	0.0000	0.0000
Sb-129	4.3610 h 0.69	1.2578E+22	1.5009E+07	1.3600	0.3940	0.0000	0.0000
Xe-135m	15.290 m 0.33	7.2424E+20	1.4789E+07	0.4320	0.0984	0.0000	0.0000
Br-83	2.4000 h 0.83	6.6963E+21	1.4519E+07	0.0065	0.3249	0.0000	0.0000
Sb-130	39.500 m 2.03	1.7881E+21	1.4134E+07	3.2700	0.7030	0.0000	0.0000
Te-129	1.1600 h 0.29	2.6101E+21	1.1709E+07	0.0631	0.5420	0.0000	0.0000
Kr-83m	1.8300 h 1.09	4.0639E+21	1.1556E+07	0.0026	0.0382	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.3232E+23	1.0440E+07	0.1450	0.4080	0.0000	0.0000
Te-133	12.450 m 2.41	3.8168E+20	9.5719E+06	0.9540	0.7970	0.0000	0.0000
Sn-128	59.100 m 0.85	1.7947E+21	9.4815E+06	0.6020	0.2520	0.0000	0.0000
Tc-101	14.200 m 0.70	3.9355E+20	8.6533E+06	0.3387	0.4770	0.0000	0.0000
Sb-131	23.030 m 0.17	5.3966E+20	7.3165E+06	1.8100	0.5820	0.0000	0.0000
Rh-105m	40.000 s 0.00	1.5534E+19	7.2753E+06	0.0345	0.0948	0.0000	0.0000
Br-84	31.800 m 0.25	7.1895E+20	7.0590E+06	1.7680	1.2360	0.0000	0.0000
Te-132	3.2040 d 0.41	1.0407E+23	7.0428E+06	0.2340	0.1020	0.0000	0.0000
Y-94	18.700 m 0.53	3.8500E+20	6.4283E+06	0.7780	1.8130	0.0000	0.0000
Sb-128	9.0110 h 0.33	9.1093E+21	5.2606E+06	3.1100	0.5060	0.0000	0.0000
Ba-141	18.270 m 0.38	3.0406E+20	5.1963E+06	0.8470	0.9670	0.0000	0.0000
Sn-127	2.1000 h 1.91	1.9699E+21	4.8814E+06	1.8600	0.5190	0.0000	0.0000
I-132	2.2950 h 0.57	2.0407E+21	4.6271E+06	2.2900	0.4940	0.0000	0.0000
Tc-99m	6.0110 h 0.17	2.8364E+21	2.4555E+06	0.1240	0.0142	0.0000	0.0000
Ba-140	12.770 d 0.12	1.3525E+23	2.2964E+06	0.1830	0.3100	0.0000	0.0000
Tc-104	18.300 m 1.64	1.2422E+20	2.1194E+06	2.0000	1.6100	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867381D+24

Total number of nuclides = 696
Total activity (Ci) = 2.08297E+09

Total number of decays = 9.31066E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 57.391
Average chain length = 3.5476

Average gamma E (MeV) = 1.1861
Average beta E (MeV) = 0.65702
Average alpha E (MeV) = 1.65587E-21

Composite Exposure Rate Conversion Factor = 20.7883053 R/hr per Ci/m2
Composite ECF per FGR table = 20.0057030 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 14.8257208 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.34950924 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
I-134	52.500	m	0.38	2.6963E+22	1.6035E+08	2.6100	0.0618	0.0000
Ba-139	1.3840	h	0.34	3.0199E+22	1.1355E+08	0.0454	0.8990	0.0000
Sr-92	2.7100	h	0.37	5.5802E+22	1.0715E+08	1.3410	0.1770	0.0000
La-141	3.9190	h	0.77	8.0433E+22	1.0680E+08	1.4500	0.9626	0.0000
La-142	1.5180	h	0.55	3.0543E+22	1.0470E+08	2.4900	0.8420	0.0000
I-135	6.5690	h	0.30	1.0097E+23	7.9986E+07	1.6500	0.3770	0.0000
Y-92	3.5390	h	0.57	5.2960E+22	7.7874E+07	0.2570	1.4300	0.0000
Rb-88	17.800	m	0.56	3.9254E+21	6.8856E+07	0.6370	2.0700	0.0000
Kr-88	2.8390	h	1.06	3.3666E+22	6.1709E+07	1.9550	0.3616	0.0000
Y-93	10.180	h	0.79	1.1267E+23	5.7596E+07	0.0919	1.1720	0.0000
Sr-91	9.6310	h	0.52	1.0061E+23	5.4360E+07	1.0480	0.6670	0.0000
Pr-145	5.9830	h	0.17	5.8904E+22	5.1233E+07	0.0159	0.6770	0.0000
Te-134	41.800	m	1.91	5.2735E+21	3.9391E+07	0.8580	0.2430	0.0000
Kr-87	1.2720	h	0.79	9.2998E+21	3.8046E+07	0.7960	1.3380	0.0000
Zr-97	16.740	h	0.07	1.1942E+23	3.7122E+07	0.1800	0.7020	0.0000
Cs-138	33.420	m	0.54	3.8466E+21	3.5937E+07	2.3600	1.2400	0.0000
Nb-97m	52.700	s	3.42	9.9343E+19	3.5314E+07	0.7278	0.0156	0.0000
I-133	20.800	h	0.48	1.3541E+23	3.3876E+07	0.6080	0.4100	0.0000
Nb-97	1.2020	h	0.97	7.7324E+21	3.3476E+07	0.6670	0.4671	0.0000
Y-91m	49.720	m	0.08	5.1351E+21	3.2247E+07	0.5283	0.0279	0.0000
Te-133m	55.400	m	0.72	4.4119E+21	2.4865E+07	1.6960	0.6000	0.0000
Xe-135	9.1390	h	0.22	4.2629E+22	2.4273E+07	0.2490	0.3190	0.0000
Ru-105	4.4390	h	0.45	1.9647E+22	2.3032E+07	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	1.9422E+22	2.2555E+07	0.1570	0.2282	0.0000
Nd-149	1.7280	h	0.06	6.5781E+21	1.9810E+07	0.3850	0.5040	0.0000
Ce-143	1.3800	d	0.15	1.1957E+23	1.8787E+07	0.2750	0.4390	0.0000
Te-131	25.000	m	0.40	1.1833E+21	1.4779E+07	0.4220	0.7210	0.0000
Xe-135m	15.290	m	0.33	6.7317E+20	1.3746E+07	0.4320	0.0984	0.0000
Sb-129	4.3610	h	0.69	1.1313E+22	1.3499E+07	1.3600	0.3940	0.0000
Br-83	2.4000	h	0.83	5.5512E+21	1.2036E+07	0.0065	0.3249	0.0000
Kr-83m	1.8300	h	1.09	4.1915E+21	1.1919E+07	0.0026	0.0382	0.0000
Te-129	1.1600	h	0.29	2.6204E+21	1.1755E+07	0.0631	0.5420	0.0000
Mo-99	2.7480	d	0.02	1.3140E+23	1.0367E+07	0.1450	0.4080	0.0000
Te-132	3.2040	d	0.41	1.0345E+23	7.0005E+06	0.2340	0.1020	0.0000
Sb-130	39.500	m	2.03	8.8544E+20	6.9989E+06	3.2700	0.7030	0.0000
Rh-105m	40.000	s	0.00	1.3996E+19	6.5551E+06	0.0345	0.0948	0.0000
Pr-146	24.150	m	0.75	4.7360E+20	6.1230E+06	1.0200	1.3000	0.0000
Sn-128	59.100	m	0.85	1.1220E+21	5.9274E+06	0.6020	0.2520	0.0000
Te-133	12.450	m	2.41	2.2513E+20	5.6458E+06	0.9540	0.7970	0.0000
Sb-128	9.0110	h	0.33	9.3078E+21	5.3752E+06	3.1100	0.5060	0.0000
I-132	2.2950	h	0.57	2.2555E+21	5.1143E+06	2.2900	0.4940	0.0000
Sn-127	2.1000	h	1.91	1.5803E+21	3.9161E+06	1.8600	0.5190	0.0000
Tc-99m	6.0110	h	0.17	3.4103E+21	2.9523E+06	0.1240	0.0142	0.0000
Br-84	31.800	m	0.25	3.0029E+20	2.9484E+06	1.7680	1.2360	0.0000
Ba-140	12.770	d	0.12	1.3504E+23	2.2929E+06	0.1830	0.3100	0.0000
Sb-131	23.030	m	0.17	1.6165E+20	2.1916E+06	1.8100	0.5820	0.0000
Rh-105	1.4730	d	0.17	1.2059E+22	1.7751E+06	0.0773	0.1521	0.0000
Te-131m	1.2500	d	0.64	1.0063E+22	1.7455E+06	1.4200	0.0523	0.0000
Pm-149	2.2120	d	0.09	1.7605E+22	1.7257E+06	0.0119	0.3670	0.0000
Pm-151	1.1830	d	0.14	9.2456E+21	1.6946E+06	0.3270	0.3050	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 685
Total activity (Ci) = 1.64576E+09

Total number of decays = 9.47482E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 58.403
Average chain length = 3.5476

Average gamma E (MeV) = 1.1055
Average beta E (MeV) = 0.64744
Average alpha E (MeV) = 2.15055E-21

Composite Exposure Rate Conversion Factor = 19.4704266 R/hr per Ci/m2
Composite ECF per FGR table = 18.3405514 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 13.8193731 Rem/hr per Ci/m2

Fission Product Source

Point in time = 4.18320704 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
I-134	52.500 m 0.38	1.6009E+22	9.5209E+07	2.6100	0.0618	0.0000	0.0000
La-141	3.9190 h 0.77	6.9457E+22	9.2228E+07	1.4500	0.9626	0.0000	0.0000
Sr-92	2.7100 h 0.37	4.5086E+22	8.6576E+07	1.3410	0.1770	0.0000	0.0000
Y-92	3.5390 h 0.57	5.4840E+22	8.0637E+07	0.2570	1.4300	0.0000	0.0000
Ba-139	1.3840 h 0.34	1.9891E+22	7.4791E+07	0.0454	0.8990	0.0000	0.0000
I-135	6.5690 h 0.30	9.2467E+22	7.3250E+07	1.6500	0.3770	0.0000	0.0000
La-142	1.5180 h 0.55	2.0873E+22	7.1555E+07	2.4900	0.8420	0.0000	0.0000
Rb-88	17.800 m 0.56	3.2046E+21	5.6211E+07	0.6370	2.0700	0.0000	0.0000
Y-93	10.180 h 0.79	1.0645E+23	5.4417E+07	0.0919	1.1720	0.0000	0.0000
Sr-91	9.6310 h 0.52	9.4748E+22	5.1194E+07	1.0480	0.6670	0.0000	0.0000
Kr-88	2.8390 h 1.06	2.7466E+22	5.0344E+07	1.9550	0.3616	0.0000	0.0000
Pr-145	5.9830 h 0.17	5.3481E+22	4.6516E+07	0.0159	0.6770	0.0000	0.0000
Zr-97	16.740 h 0.07	1.1536E+23	3.5862E+07	0.1800	0.7020	0.0000	0.0000
Nb-97	1.2020 h 0.97	7.9962E+21	3.4618E+07	0.6670	0.4671	0.0000	0.0000
Nb-97m	52.700 s 3.42	9.5972E+19	3.4116E+07	0.7278	0.0156	0.0000	0.0000
I-133	20.800 h 0.48	1.3382E+23	3.3480E+07	0.6080	0.4100	0.0000	0.0000
Y-91m	49.720 m 0.08	5.0304E+21	3.1590E+07	0.5283	0.0279	0.0000	0.0000
Xe-135	9.1390 h 0.22	4.8300E+22	2.7502E+07	0.2490	0.3190	0.0000	0.0000
Kr-87	1.2720 h 0.79	5.9043E+21	2.4155E+07	0.7960	1.3380	0.0000	0.0000
Ru-105	4.4390 h 0.45	1.7249E+22	2.0220E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.7072E+22	1.9826E+07	0.1570	0.2282	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.1751E+23	1.8463E+07	0.2750	0.4390	0.0000	0.0000
Te-134	41.800 m 1.91	2.3007E+21	1.7185E+07	0.8580	0.2430	0.0000	0.0000
Nd-149	1.7280 h 0.06	4.7083E+21	1.4179E+07	0.3850	0.5040	0.0000	0.0000
Te-133m	55.400 m 0.72	2.3595E+21	1.3298E+07	1.6960	0.6000	0.0000	0.0000
Cs-138	33.420 m 0.54	1.3662E+21	1.2764E+07	2.3600	1.2400	0.0000	0.0000
Xe-135m	15.290 m 0.33	6.1617E+20	1.2582E+07	0.4320	0.0984	0.0000	0.0000
Sb-129	4.3610 h 0.69	9.9088E+21	1.1824E+07	1.3600	0.3940	0.0000	0.0000
Kr-83m	1.8300 h 1.09	4.0691E+21	1.1571E+07	0.0026	0.0382	0.0000	0.0000
Te-129	1.1600 h 0.29	2.5107E+21	1.1263E+07	0.0631	0.5420	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.3025E+23	1.0277E+07	0.1450	0.4080	0.0000	0.0000
Br-83	2.4000 h 0.83	4.3723E+21	9.4802E+06	0.0065	0.3249	0.0000	0.0000
Te-132	3.2040 d 0.41	1.0267E+23	6.9481E+06	0.2340	0.1020	0.0000	0.0000
Rh-105m	40.000 s 0.00	1.2288E+19	5.7550E+06	0.0345	0.0948	0.0000	0.0000
I-132	2.2950 h 0.57	2.4565E+21	5.5700E+06	2.2900	0.4940	0.0000	0.0000
Sb-128	9.0110 h 0.33	9.2105E+21	5.3190E+06	3.1100	0.5060	0.0000	0.0000
Te-131	25.000 m 0.40	3.7017E+20	4.6231E+06	0.4220	0.7210	0.0000	0.0000
Tc-99m	6.0110 h 0.17	4.0600E+21	3.5148E+06	0.1240	0.0142	0.0000	0.0000
Sn-128	59.100 m 0.85	6.2400E+20	3.2967E+06	0.6020	0.2520	0.0000	0.0000
Te-133	12.450 m 2.41	1.1977E+20	3.0038E+06	0.9540	0.7970	0.0000	0.0000
Sn-127	2.1000 h 1.91	1.2002E+21	2.9740E+06	1.8600	0.5190	0.0000	0.0000
Sb-130	39.500 m 2.03	3.6808E+20	2.9095E+06	3.2700	0.7030	0.0000	0.0000
Ba-140	12.770 d 0.12	1.3479E+23	2.2886E+06	0.1830	0.3100	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.4244E+22	2.0967E+06	0.0773	0.1521	0.0000	0.0000
Pm-149	2.2120 d 0.09	1.9274E+22	1.8892E+06	0.0119	0.3670	0.0000	0.0000
Te-131m	1.2500 d 0.64	9.8809E+21	1.7140E+06	1.4200	0.0523	0.0000	0.0000
I-131	8.0230 d 0.02	6.3378E+22	1.7128E+06	0.3823	0.1920	0.0000	0.0000
Pm-151	1.1830 d 0.14	9.0594E+21	1.6604E+06	0.3270	0.3050	0.0000	0.0000
Pr-146	24.150 m 0.75	1.1352E+20	1.4677E+06	1.0200	1.3000	0.0000	0.0000
As-78	1.5120 h 0.22	3.5684E+20	1.2281E+06	1.2520	1.2530	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 673
Total activity (Ci) = 1.31134E+09

Total number of decays = 9.63752E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 59.406
Average chain length = 3.5476

Average gamma E (MeV) = 1.0071
Average beta E (MeV) = 0.64658
Average alpha E (MeV) = 2.80786E-21

Composite Exposure Rate Conversion Factor = 17.8620052 R/hr per Ci/m2
Composite ECF per FGR table = 16.3342304 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 12.5888748 Rem/hr per Ci/m2

Fission Product Source

Point in time = 5.22441292 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Y-92	3.5390	h	0.57	5.4216E+22	7.9720E+07	0.2570	1.4300	0.0000
La-141	3.9190	h	0.77	5.7783E+22	7.6727E+07	1.4500	0.9626	0.0000
Sr-92	2.7100	h	0.37	3.4545E+22	6.6334E+07	1.3410	0.1770	0.0000
I-135	6.5690	h	0.30	8.2846E+22	6.5629E+07	1.6500	0.3770	0.0000
Y-93	10.180	h	0.79	9.9169E+22	5.0693E+07	0.0919	1.1720	0.0000
Sr-91	9.6310	h	0.52	8.7908E+22	4.7498E+07	1.0480	0.6670	0.0000
I-134	52.500	m	0.38	7.9588E+21	4.7333E+07	2.6100	0.0618	0.0000
La-142	1.5180	h	0.55	1.2975E+22	4.4480E+07	2.4900	0.8420	0.0000
Ba-139	1.3840	h	0.34	1.1809E+22	4.4400E+07	0.0454	0.8990	0.0000
Rb-88	17.800	m	0.56	2.4855E+21	4.3599E+07	0.6370	2.0700	0.0000
Pr-145	5.9830	h	0.17	4.7403E+22	4.1230E+07	0.0159	0.6770	0.0000
Kr-88	2.8390	h	1.06	2.1301E+22	3.9043E+07	1.9550	0.3616	0.0000
Nb-97	1.2020	h	0.97	8.0417E+21	3.4815E+07	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	1.1050E+23	3.4349E+07	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	9.1922E+19	3.2676E+07	0.7278	0.0156	0.0000
I-133	20.800	h	0.48	1.3058E+23	3.2668E+07	0.6080	0.4100	0.0000
Xe-135	9.1390	h	0.22	5.3928E+22	3.0707E+07	0.2490	0.3190	0.0000
Y-91m	49.720	m	0.08	4.7782E+21	3.0006E+07	0.5283	0.0279	0.0000
Ce-143	1.3800	d	0.15	1.1498E+23	1.8065E+07	0.2750	0.4390	0.0000
Ru-105	4.4390	h	0.45	1.4660E+22	1.7186E+07	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	1.4532E+22	1.6877E+07	0.1570	0.2282	0.0000
Kr-87	1.2720	h	0.79	3.3478E+21	1.3696E+07	0.7960	1.3380	0.0000
Xe-135m	15.290	m	0.33	5.5203E+20	1.1273E+07	0.4320	0.0984	0.0000
Kr-83m	1.8300	h	1.09	3.6716E+21	1.0441E+07	0.0026	0.0382	0.0000
Te-129	1.1600	h	0.29	2.2797E+21	1.0227E+07	0.0631	0.5420	0.0000
Mo-99	2.7480	d	0.02	1.2883E+23	1.0165E+07	0.1450	0.4080	0.0000
Sb-129	4.3610	h	0.69	8.3975E+21	1.0020E+07	1.3600	0.3940	0.0000
Nd-149	1.7280	h	0.06	3.1008E+21	9.3380E+06	0.3850	0.5040	0.0000
Br-83	2.4000	h	0.83	3.2387E+21	7.0223E+06	0.0065	0.3249	0.0000
Te-132	3.2040	d	0.41	1.0171E+23	6.8832E+06	0.2340	0.1020	0.0000
Te-134	41.800	m	1.91	8.1649E+20	6.0989E+06	0.8580	0.2430	0.0000
Te-133m	55.400	m	0.72	1.0798E+21	6.0859E+06	1.6960	0.6000	0.0000
I-132	2.2950	h	0.57	2.6304E+21	5.9643E+06	2.2900	0.4940	0.0000
Sb-128	9.0110	h	0.33	8.8115E+21	5.0886E+06	3.1100	0.5060	0.0000
Rh-105m	40.000	s	0.00	1.0444E+19	4.8914E+06	0.0345	0.0948	0.0000
Tc-99m	6.0110	h	0.17	4.7768E+21	4.1353E+06	0.1240	0.0142	0.0000
Cs-138	33.420	m	0.54	3.7418E+20	3.4958E+06	2.3600	1.2400	0.0000
Rh-105	1.4730	d	0.17	1.6519E+22	2.4316E+06	0.0773	0.1521	0.0000
Ba-140	12.770	d	0.12	1.3447E+23	2.2832E+06	0.1830	0.3100	0.0000
Sn-127	2.1000	h	1.91	8.5111E+20	2.1091E+06	1.8600	0.5190	0.0000
Pm-149	2.2120	d	0.09	2.0609E+22	2.0202E+06	0.0119	0.3670	0.0000
I-131	8.0230	d	0.02	6.3674E+22	1.7208E+06	0.3823	0.1920	0.0000
Te-131m	1.2500	d	0.64	9.6485E+21	1.6736E+06	1.4200	0.0523	0.0000
Pm-151	1.1830	d	0.14	8.8320E+21	1.6188E+06	0.3270	0.3050	0.0000
Sn-128	59.100	m	0.85	2.9990E+20	1.5844E+06	0.6020	0.2520	0.0000
Te-133	12.450	m	2.41	5.4781E+19	1.3738E+06	0.9540	0.7970	0.0000
Te-131	25.000	m	0.40	9.9054E+19	1.2371E+06	0.4220	0.7210	0.0000
Sb-130	39.500	m	2.03	1.2298E+20	9.7210E+05	3.2700	0.7030	0.0000
Nd-147	10.980	d	0.09	4.8400E+22	9.5578E+05	0.1410	0.2690	0.0000
As-78	1.5120	h	0.22	2.7436E+20	9.4424E+05	1.2520	1.2530	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 660
Total activity (Ci) = 1.05223E+09

Total number of decays = 9.80001E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 60.407
Average chain length = 3.5476

Average gamma E (MeV) = 0.90479
Average beta E (MeV) = 0.64754
Average alpha E (MeV) = 3.71338E-21

Composite Exposure Rate Conversion Factor = 16.1810932 R/hr per Ci/m2
Composite ECF per FGR table = 14.3063669 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 11.3098497 Rem/hr per Ci/m2

Fission Product Source

Point in time = 6.52478266 hrs

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Y-92	3.5390 h 0.57	5.0594E+22	7.4394E+07	0.2570	1.4300	0.0000	0.0000
La-141	3.9190 h 0.77	4.5912E+22	6.0963E+07	1.4500	0.9626	0.0000	0.0000
I-135	6.5690 h 0.30	7.2224E+22	5.7214E+07	1.6500	0.3770	0.0000	0.0000
Sr-92	2.7100 h 0.37	2.4771E+22	4.7565E+07	1.3410	0.1770	0.0000	0.0000
Y-93	10.180 h 0.79	9.0766E+22	4.6398E+07	0.0919	1.1720	0.0000	0.0000
Sr-91	9.6310 h 0.52	8.0054E+22	4.3255E+07	1.0480	0.6670	0.0000	0.0000
Pr-145	5.9830 h 0.17	4.0774E+22	3.5464E+07	0.0159	0.6770	0.0000	0.0000
Nb-97	1.2020 h 0.97	7.8640E+21	3.4046E+07	0.6670	0.4671	0.0000	0.0000
Xe-135	9.1390 h 0.22	5.9024E+22	3.3609E+07	0.2490	0.3190	0.0000	0.0000
Zr-97	16.740 h 0.07	1.0470E+23	3.2548E+07	0.1800	0.7020	0.0000	0.0000
Rb-88	17.800 m 0.56	1.8094E+21	3.1739E+07	0.6370	2.0700	0.0000	0.0000
I-133	20.800 h 0.48	1.2573E+23	3.1455E+07	0.6080	0.4100	0.0000	0.0000
Nb-97m	52.700 s 3.42	8.7104E+19	3.0964E+07	0.7278	0.0156	0.0000	0.0000
Kr-88	2.8390 h 1.06	1.5506E+22	2.8423E+07	1.9550	0.3616	0.0000	0.0000
Y-91m	49.720 m 0.08	4.4037E+21	2.7654E+07	0.5283	0.0279	0.0000	0.0000
La-142	1.5180 h 0.55	7.1654E+21	2.4563E+07	2.4900	0.8420	0.0000	0.0000
Ba-139	1.3840 h 0.34	6.1568E+21	2.3149E+07	0.0454	0.8990	0.0000	0.0000
I-134	52.500 m 0.38	3.1725E+21	1.8868E+07	2.6100	0.0618	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.1189E+23	1.7580E+07	0.2750	0.4390	0.0000	0.0000
Ru-105	4.4390 h 0.45	1.1966E+22	1.4028E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810 h 0.18	1.1885E+22	1.3802E+07	0.1570	0.2282	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.2708E+23	1.0027E+07	0.1450	0.4080	0.0000	0.0000
Xe-135m	15.290 m 0.33	4.8125E+20	9.8273E+06	0.4320	0.0984	0.0000	0.0000
Te-129	1.1600 h 0.29	1.9472E+21	8.7353E+06	0.0631	0.5420	0.0000	0.0000
Kr-83m	1.8300 h 1.09	3.0315E+21	8.6204E+06	0.0026	0.0382	0.0000	0.0000
Sb-129	4.3610 h 0.69	6.8295E+21	8.1494E+06	1.3600	0.3940	0.0000	0.0000
Te-132	3.2040 d 0.41	1.0053E+23	6.8030E+06	0.2340	0.1020	0.0000	0.0000
Kr-87	1.2720 h 0.79	1.6482E+21	6.7429E+06	0.7960	1.3380	0.0000	0.0000
I-132	2.2950 h 0.57	2.7652E+21	6.2701E+06	2.2900	0.4940	0.0000	0.0000
Nd-149	1.7280 h 0.06	1.8405E+21	5.5427E+06	0.3850	0.5040	0.0000	0.0000
Br-83	2.4000 h 0.83	2.2250E+21	4.8243E+06	0.0065	0.3249	0.0000	0.0000
Tc-99m	6.0110 h 0.17	5.5414E+21	4.7973E+06	0.1240	0.0142	0.0000	0.0000
Sb-128	9.0110 h 0.33	8.1426E+21	4.7023E+06	3.1100	0.5060	0.0000	0.0000
Rh-105m	40.000 s 0.00	8.5248E+18	3.9925E+06	0.0345	0.0948	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.8764E+22	2.7620E+06	0.0773	0.1521	0.0000	0.0000
Te-133m	55.400 m 0.72	4.0683E+20	2.2928E+06	1.6960	0.6000	0.0000	0.0000
Ba-140	12.770 d 0.12	1.3408E+23	2.2765E+06	0.1830	0.3100	0.0000	0.0000
Pm-149	2.2120 d 0.09	2.1511E+22	2.1085E+06	0.0119	0.3670	0.0000	0.0000
I-131	8.0230 d 0.02	6.3728E+22	1.7223E+06	0.3823	0.1920	0.0000	0.0000
Te-134	41.800 m 1.91	2.2390E+20	1.6725E+06	0.8580	0.2430	0.0000	0.0000
Te-131m	1.2500 d 0.64	9.3633E+21	1.6242E+06	1.4200	0.0523	0.0000	0.0000
Pm-151	1.1830 d 0.14	8.5560E+21	1.5682E+06	0.3270	0.3050	0.0000	0.0000
Sn-127	2.1000 h 1.91	5.5409E+20	1.3730E+06	1.8600	0.5190	0.0000	0.0000
Xe-133	5.2440 d 0.08	2.5940E+22	1.0725E+06	0.0463	0.1360	0.0000	0.0000
Nd-147	10.980 d 0.09	4.8235E+22	9.5251E+05	0.1410	0.2690	0.0000	0.0000
Ag-109m	39.600 s 0.51	1.5542E+18	7.3527E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700 h 0.02	1.9351E+21	7.3503E+05	0.0121	0.4380	0.0000	0.0000
In-117m	1.9370 h 0.60	2.5893E+20	6.9562E+05	0.0913	0.2700	0.0000	0.0000
Cs-138	33.420 m 0.54	7.4189E+19	6.9312E+05	2.3600	1.2400	0.0000	0.0000
As-78	1.5120 h 0.22	1.8700E+20	6.4359E+05	1.2520	1.2530	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867381D+24

Total number of nuclides = 649
Total activity (Ci) = 8.49410E+08

Total number of decays = 9.96336E+24
Asympt number of decays = 1.62233E+25
Percent of decays = 61.414
Average chain length = 3.5476

Average gamma E (MeV) = 0.81202
Average beta E (MeV) = 0.64321
Average alpha E (MeV) = 5.01726E-21

Composite Exposure Rate Conversion Factor = 14.6369247 R/hr per Ci/m2
Composite ECF per FGR table = 12.5626707 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 10.1502409 Rem/hr per Ci/m2

Fission Product Source

Point in time = 8.14881039 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Y-92	3.5390	h	0.57	4.3943E+22	6.4614E+07	0.2570	1.4300	0.0000	0.0000
I-135	6.5690	h	0.30	6.0850E+22	4.8204E+07	1.6500	0.3770	0.0000	0.0000
La-141	3.9190	h	0.77	3.4449E+22	4.5743E+07	1.4500	0.9626	0.0000	0.0000
Y-93	10.180	h	0.79	8.1264E+22	4.1540E+07	0.0919	1.1720	0.0000	0.0000
Sr-91	9.6310	h	0.52	7.1223E+22	3.8483E+07	1.0480	0.6670	0.0000	0.0000
Xe-135	9.1390	h	0.22	6.2927E+22	3.5831E+07	0.2490	0.3190	0.0000	0.0000
Nb-97	1.2020	h	0.97	7.4842E+21	3.2401E+07	0.6670	0.4671	0.0000	0.0000
Sr-92	2.7100	h	0.37	1.6351E+22	3.1397E+07	1.3410	0.1770	0.0000	0.0000
Zr-97	16.740	h	0.07	9.7894E+22	3.0431E+07	0.1800	0.7020	0.0000	0.0000
I-133	20.800	h	0.48	1.1940E+23	2.9871E+07	0.6080	0.4100	0.0000	0.0000
Pr-145	5.9830	h	0.17	3.3781E+22	2.9381E+07	0.0159	0.6770	0.0000	0.0000
Nb-97m	52.700	s	3.42	8.1439E+19	2.8950E+07	0.7278	0.0156	0.0000	0.0000
Y-91m	49.720	m	0.08	3.9374E+21	2.4726E+07	0.5283	0.0279	0.0000	0.0000
Rb-88	17.800	m	0.56	1.2171E+21	2.1350E+07	0.6370	2.0700	0.0000	0.0000
Kr-88	2.8390	h	1.06	1.0431E+22	1.9119E+07	1.9550	0.3616	0.0000	0.0000
Ce-143	1.3800	d	0.15	1.0815E+23	1.6992E+07	0.2750	0.4390	0.0000	0.0000
La-142	1.5180	h	0.55	3.4134E+21	1.1701E+07	2.4900	0.8420	0.0000	0.0000
Ru-105	4.4390	h	0.45	9.2860E+21	1.0886E+07	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810	h	0.18	9.2444E+21	1.0736E+07	0.1570	0.2282	0.0000	0.0000
Ba-139	1.3840	h	0.34	2.7297E+21	1.0264E+07	0.0454	0.8990	0.0000	0.0000
Mo-99	2.7480	d	0.02	1.2493E+23	9.8575E+06	0.1450	0.4080	0.0000	0.0000
Xe-135m	15.290	m	0.33	4.0546E+20	8.2796E+06	0.4320	0.0984	0.0000	0.0000
Te-129	1.1600	h	0.29	1.5526E+21	6.9648E+06	0.0631	0.5420	0.0000	0.0000
Te-132	3.2040	d	0.41	9.9066E+22	6.7041E+06	0.2340	0.1020	0.0000	0.0000
I-132	2.2950	h	0.57	2.8526E+21	6.4680E+06	2.2900	0.4940	0.0000	0.0000
Kr-83m	1.8300	h	1.09	2.2456E+21	6.3857E+06	0.0026	0.0382	0.0000	0.0000
Sb-129	4.3610	h	0.69	5.2758E+21	6.2954E+06	1.3600	0.3940	0.0000	0.0000
I-134	52.500	m	0.38	9.6151E+20	5.7183E+06	2.6100	0.0618	0.0000	0.0000
Tc-99m	6.0110	h	0.17	6.3217E+21	5.4728E+06	0.1240	0.0142	0.0000	0.0000
Sb-128	9.0110	h	0.33	7.2624E+21	4.1940E+06	3.1100	0.5060	0.0000	0.0000
Rh-105m	40.000	s	0.00	6.6153E+18	3.0983E+06	0.0345	0.0948	0.0000	0.0000
Rh-105	1.4730	d	0.17	2.0814E+22	3.0638E+06	0.0773	0.1521	0.0000	0.0000
Br-83	2.4000	h	0.83	1.3920E+21	3.0181E+06	0.0065	0.3249	0.0000	0.0000
Nd-149	1.7280	h	0.06	9.5946E+20	2.8894E+06	0.3850	0.5040	0.0000	0.0000
Kr-87	1.2720	h	0.79	6.8026E+20	2.7830E+06	0.7960	1.3380	0.0000	0.0000
Ba-140	12.770	d	0.12	1.3359E+23	2.2682E+06	0.1830	0.3100	0.0000	0.0000
Pm-149	2.2120	d	0.09	2.1930E+22	2.1497E+06	0.0119	0.3670	0.0000	0.0000
I-131	8.0230	d	0.02	6.3710E+22	1.7218E+06	0.3823	0.1920	0.0000	0.0000
Te-131m	1.2500	d	0.64	9.0185E+21	1.5643E+06	1.4200	0.0523	0.0000	0.0000
Pm-151	1.1830	d	0.14	8.2235E+21	1.5072E+06	0.3270	0.3050	0.0000	0.0000
Xe-133	5.2440	d	0.08	3.2145E+22	1.3291E+06	0.0463	0.1360	0.0000	0.0000
Nd-147	10.980	d	0.09	4.8030E+22	9.4845E+05	0.1410	0.2690	0.0000	0.0000
Sn-127	2.1000	h	1.91	3.2418E+20	8.0331E+05	1.8600	0.5190	0.0000	0.0000
Te-133m	55.400	m	0.72	1.2021E+20	6.7748E+05	1.6960	0.6000	0.0000	0.0000
Ag-109m	39.600	s	0.51	1.4316E+18	6.7727E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700	h	0.02	1.7825E+21	6.7705E+05	0.0121	0.4380	0.0000	0.0000
Ce-141	32.500	d	0.03	9.9245E+22	6.6212E+05	0.0771	0.1710	0.0000	0.0000
In-117m	1.9370	h	0.60	1.9429E+20	5.2196E+05	0.0913	0.2700	0.0000	0.0000
Zr-95	64.030	d	0.01	1.4391E+23	4.8732E+05	0.7328	0.1200	0.0000	0.0000
In-117	43.200	m	1.62	6.2277E+19	4.5011E+05	0.6920	0.2670	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 643
Total activity (Ci) = 6.87587E+08

Total number of decays = 1.01283E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 62.431
Average chain length = 3.5476

Average gamma E (MeV) = 0.73642
Average beta E (MeV) = 0.62937
Average alpha E (MeV) = 7.00685E-21

Composite Exposure Rate Conversion Factor = 13.3498383 R/hr per Ci/m2
Composite ECF per FGR table = 11.2706270 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 9.20528984 Rem/hr per Ci/m2

Fission Product Source

Point in time = 10.1770706 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Y-92	3.5390	h	0.57	3.4905E+22	5.1325E+07	0.2570	1.4300	0.0000
I-135	6.5690	h	0.30	4.9126E+22	3.8916E+07	1.6500	0.3770	0.0000
Xe-135	9.1390	h	0.22	6.4852E+22	3.6927E+07	0.2490	0.3190	0.0000
Y-93	10.180	h	0.79	7.0782E+22	3.6182E+07	0.0919	1.1720	0.0000
Sr-91	9.6310	h	0.52	6.1549E+22	3.3256E+07	1.0480	0.6670	0.0000
La-141	3.9190	h	0.77	2.4065E+22	3.1954E+07	1.4500	0.9626	0.0000
Nb-97	1.2020	h	0.97	6.9392E+21	3.0042E+07	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	9.0009E+22	2.7980E+07	0.1800	0.7020	0.0000
I-133	20.800	h	0.48	1.1169E+23	2.7942E+07	0.6080	0.4100	0.0000
Nb-97m	52.700	s	3.42	7.4879E+19	2.6618E+07	0.7278	0.0156	0.0000
Pr-145	5.9830	h	0.17	2.6707E+22	2.3229E+07	0.0159	0.6770	0.0000
Y-91m	49.720	m	0.08	3.4080E+21	2.1401E+07	0.5283	0.0279	0.0000
Sr-92	2.7100	h	0.37	9.7328E+21	1.8689E+07	1.3410	0.1770	0.0000
Ce-143	1.3800	d	0.15	1.0365E+23	1.6286E+07	0.2750	0.4390	0.0000
Rb-88	17.800	m	0.56	7.4179E+20	1.3012E+07	0.6370	2.0700	0.0000
Kr-88	2.8390	h	1.06	6.3569E+21	1.1652E+07	1.9550	0.3616	0.0000
Mo-99	2.7480	d	0.02	1.2230E+23	9.6496E+06	0.1450	0.4080	0.0000
Ru-105	4.4390	h	0.45	6.7652E+21	7.9308E+06	0.7380	0.4104	0.0000
Kr-85m	4.4810	h	0.18	6.7550E+21	7.8446E+06	0.1570	0.2282	0.0000
Xe-135m	15.290	m	0.33	3.2734E+20	6.6844E+06	0.4320	0.0984	0.0000
Te-132	3.2040	d	0.41	9.7271E+22	6.5827E+06	0.2340	0.1020	0.0000
I-132	2.2950	h	0.57	2.8892E+21	6.5512E+06	2.2900	0.4940	0.0000
Tc-99m	6.0110	h	0.17	7.0715E+21	6.1219E+06	0.1240	0.0142	0.0000
Te-129	1.1600	h	0.29	1.1454E+21	5.1384E+06	0.0631	0.5420	0.0000
La-142	1.5180	h	0.55	1.3520E+21	4.6346E+06	2.4900	0.8420	0.0000
Sb-129	4.3610	h	0.69	3.8219E+21	4.5605E+06	1.3600	0.3940	0.0000
Kr-83m	1.8300	h	1.09	1.4561E+21	4.1406E+06	0.0026	0.0382	0.0000
Ba-139	1.3840	h	0.34	9.8845E+20	3.7166E+06	0.0454	0.8990	0.0000
Sb-128	9.0110	h	0.33	6.2397E+21	3.6034E+06	3.1100	0.5060	0.0000
Rh-105	1.4730	d	0.17	2.2473E+22	3.3080E+06	0.0773	0.1521	0.0000
Ba-140	12.770	d	0.12	1.3297E+23	2.2578E+06	0.1830	0.3100	0.0000
Rh-105m	40.000	s	0.00	4.8196E+18	2.2572E+06	0.0345	0.0948	0.0000
Pm-149	2.2120	d	0.09	2.1883E+22	2.1451E+06	0.0119	0.3670	0.0000
I-131	8.0230	d	0.02	6.3660E+22	1.7204E+06	0.3823	0.1920	0.0000
Br-83	2.4000	h	0.83	7.7487E+20	1.6801E+06	0.0065	0.3249	0.0000
Xe-133	5.2440	d	0.08	3.9361E+22	1.6275E+06	0.0463	0.1360	0.0000
Te-131m	1.2500	d	0.64	8.6056E+21	1.4927E+06	1.4200	0.0523	0.0000
Pm-151	1.1830	d	0.14	7.8262E+21	1.4344E+06	0.3270	0.3050	0.0000
Nd-149	1.7280	h	0.06	4.2529E+20	1.2808E+06	0.3850	0.5040	0.0000
I-134	52.500	m	0.38	2.0759E+20	1.2346E+06	2.6100	0.0618	0.0000
Nd-147	10.980	d	0.09	4.7774E+22	9.4341E+05	0.1410	0.2690	0.0000
Kr-87	1.2720	h	0.79	2.2525E+20	9.2152E+05	0.7960	1.3380	0.0000
Ce-141	32.500	d	0.03	1.0944E+23	7.3014E+05	0.0771	0.1710	0.0000
Ag-109m	39.600	s	0.51	1.2920E+18	6.1121E+05	0.0110	0.0765	0.0000
Pd-109	13.700	h	0.02	1.6086E+21	6.1102E+05	0.0121	0.4380	0.0000
Zr-95	64.030	d	0.01	1.4378E+23	4.8688E+05	0.7328	0.1200	0.0000
Ru-103	39.260	d	0.05	7.8169E+22	4.3171E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.6700E+19	4.2673E+05	0.0017	0.0375	0.0000
Sb-127	3.8500	d	1.30	7.3911E+21	4.1625E+05	0.6640	0.3140	0.0000
Sr-89	50.570	d	0.06	9.6951E+22	4.1569E+05	0.0010	0.5830	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867381D+24

Total number of nuclides = 636
Total activity (Ci) = 5.54754E+08

Total number of decays = 1.02949E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 63.458
Average chain length = 3.5476

Average gamma E (MeV) = 0.67763
Average beta E (MeV) = 0.60529
Average alpha E (MeV) = 1.02544E-20

Composite Exposure Rate Conversion Factor = 12.3171625 R/hr per Ci/m2
Composite ECF per FGR table = 10.4129391 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 8.47038841 Rem/hr per Ci/m2

Fission Product Source

Point in time = 12.7101564 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Y-92	3.5390	h	0.57	2.4816E+22	3.6489E+07	0.2570	1.4300	0.0000	0.0000
Xe-135	9.1390	h	0.22	6.4013E+22	3.6450E+07	0.2490	0.3190	0.0000	0.0000
Y-93	10.180	h	0.79	5.9568E+22	3.0450E+07	0.0919	1.1720	0.0000	0.0000
I-135	6.5690	h	0.30	3.7604E+22	2.9789E+07	1.6500	0.3770	0.0000	0.0000
Sr-91	9.6310	h	0.52	5.1292E+22	2.7714E+07	1.0480	0.6670	0.0000	0.0000
Nb-97	1.2020	h	0.97	6.2680E+21	2.7136E+07	0.6670	0.4671	0.0000	0.0000
I-133	20.800	h	0.48	1.0267E+23	2.5686E+07	0.6080	0.4100	0.0000	0.0000
Zr-97	16.740	h	0.07	8.1046E+22	2.5194E+07	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700	s	3.42	6.7423E+19	2.3967E+07	0.7278	0.0156	0.0000	0.0000
La-141	3.9190	h	0.77	1.5375E+22	2.0415E+07	1.4500	0.9626	0.0000	0.0000
Y-91m	49.720	m	0.08	2.8410E+21	1.7841E+07	0.5283	0.0279	0.0000	0.0000
Pr-145	5.9830	h	0.17	1.9915E+22	1.7321E+07	0.0159	0.6770	0.0000	0.0000
Ce-143	1.3800	d	0.15	9.8303E+22	1.5445E+07	0.2750	0.4390	0.0000	0.0000
Sr-92	2.7100	h	0.37	5.0917E+21	9.7771E+06	1.3410	0.1770	0.0000	0.0000
Mo-99	2.7480	d	0.02	1.1908E+23	9.3961E+06	0.1450	0.4080	0.0000	0.0000
Rb-88	17.800	m	0.56	3.9966E+20	7.0103E+06	0.6370	2.0700	0.0000	0.0000
Tc-99m	6.0110	h	0.17	7.7321E+21	6.6938E+06	0.1240	0.0142	0.0000	0.0000
I-132	2.2950	h	0.57	2.8778E+21	6.5252E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	9.5075E+22	6.4340E+06	0.2340	0.1020	0.0000	0.0000
Kr-88	2.8390	h	1.06	3.4249E+21	6.2778E+06	1.9550	0.3616	0.0000	0.0000
Ru-105	4.4390	h	0.45	4.5551E+21	5.3399E+06	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810	h	0.18	4.5651E+21	5.3015E+06	0.1570	0.2282	0.0000	0.0000
Xe-135m	15.290	m	0.33	2.5056E+20	5.1166E+06	0.4320	0.0984	0.0000	0.0000
Te-129	1.1600	h	0.29	7.7340E+20	3.4695E+06	0.0631	0.5420	0.0000	0.0000
Rh-105	1.4730	d	0.17	2.3538E+22	3.4648E+06	0.0773	0.1521	0.0000	0.0000
Sb-129	4.3610	h	0.69	2.5552E+21	3.0490E+06	1.3600	0.3940	0.0000	0.0000
Sb-128	9.0110	h	0.33	5.1418E+21	2.9694E+06	3.1100	0.5060	0.0000	0.0000
Kr-83m	1.8300	h	1.09	8.0153E+20	2.2792E+06	0.0026	0.0382	0.0000	0.0000
Ba-140	12.770	d	0.12	1.3221E+23	2.2449E+06	0.1830	0.3100	0.0000	0.0000
Pm-149	2.2120	d	0.09	2.1438E+22	2.1014E+06	0.0119	0.3670	0.0000	0.0000
Xe-133	5.2440	d	0.08	4.7584E+22	1.9675E+06	0.0463	0.1360	0.0000	0.0000
I-131	8.0230	d	0.02	6.3570E+22	1.7180E+06	0.3823	0.1920	0.0000	0.0000
Rh-105m	40.000	s	0.00	3.2451E+18	1.5198E+06	0.0345	0.0948	0.0000	0.0000
La-142	1.5180	h	0.55	4.2524E+20	1.4578E+06	2.4900	0.8420	0.0000	0.0000
Te-131m	1.2500	d	0.64	8.1164E+21	1.4079E+06	1.4200	0.0523	0.0000	0.0000
Pm-151	1.1830	d	0.14	7.3568E+21	1.3484E+06	0.3270	0.3050	0.0000	0.0000
Ba-139	1.3840	h	0.34	2.7797E+20	1.0451E+06	0.0454	0.8990	0.0000	0.0000
Nd-147	10.980	d	0.09	4.7457E+22	9.3714E+05	0.1410	0.2690	0.0000	0.0000
Br-83	2.4000	h	0.83	3.7282E+20	8.0838E+05	0.0065	0.3249	0.0000	0.0000
Ce-141	32.500	d	0.03	1.1787E+23	7.8640E+05	0.0771	0.1710	0.0000	0.0000
Ag-109m	39.600	s	0.51	1.1366E+18	5.3769E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700	h	0.02	1.4151E+21	5.3752E+05	0.0121	0.4380	0.0000	0.0000
Zr-95	64.030	d	0.01	1.4361E+23	4.8632E+05	0.7328	0.1200	0.0000	0.0000
Nd-149	1.7280	h	0.06	1.5396E+20	4.6365E+05	0.3850	0.5040	0.0000	0.0000
Pr-143	13.560	d	0.07	2.8636E+22	4.5789E+05	0.0003	0.3151	0.0000	0.0000
La-140	1.6780	d	0.01	3.4783E+21	4.4946E+05	2.3200	0.5340	0.0000	0.0000
Ru-103	39.260	d	0.05	7.8023E+22	4.3091E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120	m	0.00	7.6593E+19	4.2613E+05	0.0017	0.0375	0.0000	0.0000
Sr-89	50.570	d	0.06	9.6811E+22	4.1509E+05	0.0010	0.5830	0.0000	0.0000
Sb-127	3.8500	d	1.30	7.3450E+21	4.1366E+05	0.6640	0.3140	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 626
Total activity (Ci) = 4.43261E+08

Total number of decays = 1.04621E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 64.488
Average chain length = 3.5476

Average gamma E (MeV) = 0.63085
Average beta E (MeV) = 0.57211
Average alpha E (MeV) = 1.59042E-20

Composite Exposure Rate Conversion Factor = 11.4678068 R/hr per Ci/m2
Composite ECF per FGR table = 9.86688519 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.88558006 Rem/hr per Ci/m2

Fission Product Source

Point in time = 15.8737326 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Xe-135	9.1390	h	0.22	5.9836E+22	3.4071E+07	0.2490	0.3190	0.0000	0.0000
Y-93	10.180	h	0.79	4.8025E+22	2.4549E+07	0.0919	1.1720	0.0000	0.0000
Nb-97	1.2020	h	0.97	5.5033E+21	2.3826E+07	0.6670	0.4671	0.0000	0.0000
I-133	20.800	h	0.48	9.2399E+22	2.3117E+07	0.6080	0.4100	0.0000	0.0000
Y-92	3.5390	h	0.57	1.5374E+22	2.2607E+07	0.2570	1.4300	0.0000	0.0000
Zr-97	16.740	h	0.07	7.1096E+22	2.2101E+07	0.1800	0.7020	0.0000	0.0000
Sr-91	9.6310	h	0.52	4.0848E+22	2.2071E+07	1.0480	0.6670	0.0000	0.0000
I-135	6.5690	h	0.30	2.6931E+22	2.1334E+07	1.6500	0.3770	0.0000	0.0000
Nb-97m	52.700	s	3.42	5.9145E+19	2.1025E+07	0.7278	0.0156	0.0000	0.0000
Ce-143	1.3800	d	0.15	9.2005E+22	1.4456E+07	0.2750	0.4390	0.0000	0.0000
Y-91m	49.720	m	0.08	2.2627E+21	1.4209E+07	0.5283	0.0279	0.0000	0.0000
Pr-145	5.9830	h	0.17	1.3804E+22	1.2006E+07	0.0159	0.6770	0.0000	0.0000
La-141	3.9190	h	0.77	8.7862E+21	1.1667E+07	1.4500	0.9626	0.0000	0.0000
Mo-99	2.7480	d	0.02	1.1519E+23	9.0888E+06	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110	h	0.17	8.2392E+21	7.1328E+06	0.1240	0.0142	0.0000	0.0000
I-132	2.2950	h	0.57	2.8248E+21	6.4051E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040	d	0.41	9.2402E+22	6.2532E+06	0.2340	0.1020	0.0000	0.0000
Sr-92	2.7100	h	0.37	2.2670E+21	4.3531E+06	1.3410	0.1770	0.0000	0.0000
Xe-135m	15.290	m	0.33	1.7945E+20	3.6644E+06	0.4320	0.0984	0.0000	0.0000
Rh-105	1.4730	d	0.17	2.3841E+22	3.5094E+06	0.0773	0.1521	0.0000	0.0000
Ru-105	4.4390	h	0.45	2.7795E+21	3.2584E+06	0.7380	0.4104	0.0000	0.0000
Kr-85m	4.4810	h	0.18	2.7985E+21	3.2499E+06	0.1570	0.2282	0.0000	0.0000
Rb-88	17.800	m	0.56	1.8460E+20	3.2381E+06	0.6370	2.0700	0.0000	0.0000
Kr-88	2.8390	h	1.06	1.5820E+21	2.8997E+06	1.9550	0.3616	0.0000	0.0000
Xe-133	5.2440	d	0.08	5.6721E+22	2.3452E+06	0.0463	0.1360	0.0000	0.0000
Sb-128	9.0110	h	0.33	4.0323E+21	2.3286E+06	3.1100	0.5060	0.0000	0.0000
Ba-140	12.770	d	0.12	1.3127E+23	2.2289E+06	0.1830	0.3100	0.0000	0.0000
Te-129	1.1600	h	0.29	4.7094E+20	2.1127E+06	0.0631	0.5420	0.0000	0.0000
Pm-149	2.2120	d	0.09	2.0678E+22	2.0269E+06	0.0119	0.3670	0.0000	0.0000
Sb-129	4.3610	h	0.69	1.5454E+21	1.8441E+06	1.3600	0.3940	0.0000	0.0000
I-131	8.0230	d	0.02	6.3421E+22	1.7140E+06	0.3823	0.1920	0.0000	0.0000
Te-131m	1.2500	d	0.64	7.5443E+21	1.3086E+06	1.4200	0.0523	0.0000	0.0000
Pm-151	1.1830	d	0.14	6.8100E+21	1.2482E+06	0.3270	0.3050	0.0000	0.0000
Kr-83m	1.8300	h	1.09	3.6062E+20	1.0255E+06	0.0026	0.0382	0.0000	0.0000
Nd-147	10.980	d	0.09	4.7063E+22	9.2938E+05	0.1410	0.2690	0.0000	0.0000
Rh-105m	40.000	s	0.00	1.9801E+18	9.2737E+05	0.0345	0.0948	0.0000	0.0000
Ce-141	32.500	d	0.03	1.2412E+23	8.2808E+05	0.0771	0.1710	0.0000	0.0000
Pr-143	13.560	d	0.07	3.4720E+22	5.5517E+05	0.0003	0.3151	0.0000	0.0000
La-140	1.6780	d	0.01	4.2114E+21	5.4418E+05	2.3200	0.5340	0.0000	0.0000
Zr-95	64.030	d	0.01	1.4341E+23	4.8563E+05	0.7328	0.1200	0.0000	0.0000
Ag-109m	39.600	s	0.51	9.6848E+17	4.5816E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700	h	0.02	1.2058E+21	4.5802E+05	0.0121	0.4380	0.0000	0.0000
Ru-103	39.260	d	0.05	7.7842E+22	4.2991E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120	m	0.00	7.6421E+19	4.2517E+05	0.0017	0.0375	0.0000	0.0000
Sr-89	50.570	d	0.06	9.6637E+22	4.1434E+05	0.0010	0.5830	0.0000	0.0000
Sb-127	3.8500	d	1.30	7.2187E+21	4.0654E+05	0.6640	0.3140	0.0000	0.0000
Sm-153	1.9280	d	0.01	3.3355E+21	3.7512E+05	0.0617	0.2700	0.0000	0.0000
La-142	1.5180	h	0.55	1.0029E+20	3.4382E+05	2.4900	0.8420	0.0000	0.0000
Br-83	2.4000	h	0.83	1.4952E+20	3.2420E+05	0.0065	0.3249	0.0000	0.0000
Y-91	58.510	d	0.10	8.4350E+22	3.1258E+05	0.0046	0.6032	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 613
Total activity (Ci) = 3.49506E+08

Total number of decays = 1.06278E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 65.510
Average chain length = 3.5476

Average gamma E (MeV) = 0.59180
Average beta E (MeV) = 0.53193
Average alpha E (MeV) = 2.62460E-20

Composite Exposure Rate Conversion Factor = 10.7387180 R/hr per Ci/m2
Composite ECF per FGR table = 9.51049137 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 7.39747429 Rem/hr per Ci/m2

Fission Product Source

Point in time = 19.8247452 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Xe-135	9.1390	h	0.22	5.2238E+22	2.9745E+07	0.2490	0.3190	0.0000
I-133	20.800	h	0.48	8.1001E+22	2.0265E+07	0.6080	0.4100	0.0000
Nb-97	1.2020	h	0.97	4.6736E+21	2.0233E+07	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	6.0366E+22	1.8765E+07	0.1800	0.7020	0.0000
Y-93	10.180	h	0.79	3.6697E+22	1.8759E+07	0.0919	1.1720	0.0000
Nb-97m	52.700	s	3.42	5.0219E+19	1.7852E+07	0.7278	0.0156	0.0000
Sr-91	9.6310	h	0.52	3.0738E+22	1.6608E+07	1.0480	0.6670	0.0000
I-135	6.5690	h	0.30	1.7750E+22	1.4061E+07	1.6500	0.3770	0.0000
Ce-143	1.3800	d	0.15	8.4703E+22	1.3309E+07	0.2750	0.4390	0.0000
Y-92	3.5390	h	0.57	8.0321E+21	1.1810E+07	0.2570	1.4300	0.0000
Y-91m	49.720	m	0.08	1.7027E+21	1.0692E+07	0.5283	0.0279	0.0000
Mo-99	2.7480	d	0.02	1.1050E+23	8.7191E+06	0.1450	0.4080	0.0000
Pr-145	5.9830	h	0.17	8.7338E+21	7.5964E+06	0.0159	0.6770	0.0000
Tc-99m	6.0110	h	0.17	8.5328E+21	7.3870E+06	0.1240	0.0142	0.0000
I-132	2.2950	h	0.57	2.7378E+21	6.2079E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	8.9169E+22	6.0344E+06	0.2340	0.1020	0.0000
La-141	3.9190	h	0.77	4.3683E+21	5.8004E+06	1.4500	0.9626	0.0000
Rh-105	1.4730	d	0.17	2.3291E+22	3.4285E+06	0.0773	0.1521	0.0000
Xe-133	5.2440	d	0.08	6.6546E+22	2.7515E+06	0.0463	0.1360	0.0000
Xe-135m	15.290	m	0.33	1.1827E+20	2.4152E+06	0.4320	0.0984	0.0000
Ba-140	12.770	d	0.12	1.3010E+23	2.2091E+06	0.1830	0.3100	0.0000
Pm-149	2.2120	d	0.09	1.9672E+22	1.9283E+06	0.0119	0.3670	0.0000
Kr-85m	4.4810	h	0.18	1.5188E+21	1.7638E+06	0.1570	0.2282	0.0000
Ru-105	4.4390	h	0.45	1.4998E+21	1.7582E+06	0.7380	0.4104	0.0000
Sb-128	9.0110	h	0.33	2.9757E+21	1.7184E+06	3.1100	0.5060	0.0000
I-131	8.0230	d	0.02	6.3181E+22	1.7075E+06	0.3823	0.1920	0.0000
Sr-92	2.7100	h	0.37	8.2521E+20	1.5846E+06	1.3410	0.1770	0.0000
Rh-88	17.800	m	0.56	7.0356E+19	1.2341E+06	0.6370	2.0700	0.0000
Te-131m	1.2500	d	0.64	6.8861E+21	1.1945E+06	1.4200	0.0523	0.0000
Te-129	1.1600	h	0.29	2.5367E+20	1.1380E+06	0.0631	0.5420	0.0000
Pm-151	1.1830	d	0.14	6.1838E+21	1.1334E+06	0.3270	0.3050	0.0000
Kr-88	2.8390	h	1.06	6.0292E+20	1.1051E+06	1.9550	0.3616	0.0000
Sb-129	4.3610	h	0.69	8.2475E+20	9.8414E+05	1.3600	0.3940	0.0000
Nd-147	10.980	d	0.09	4.6577E+22	9.1977E+05	0.1410	0.2690	0.0000
Ce-141	32.500	d	0.03	1.2810E+23	8.5460E+05	0.0771	0.1710	0.0000
Pr-143	13.560	d	0.07	4.1699E+22	6.6678E+05	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	5.0634E+21	6.5428E+05	2.3200	0.5340	0.0000
Rh-105m	40.000	s	0.00	1.0684E+18	5.0040E+05	0.0345	0.0948	0.0000
Zr-95	64.030	d	0.01	1.4315E+23	4.8476E+05	0.7328	0.1200	0.0000
Ru-103	39.260	d	0.05	7.7616E+22	4.2866E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.6200E+19	4.2394E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	9.6419E+22	4.1341E+05	0.0010	0.5830	0.0000
Sb-127	3.8500	d	1.30	7.0260E+21	3.9569E+05	0.6640	0.3140	0.0000
Ag-109m	39.600	s	0.51	7.9300E+17	3.7515E+05	0.0110	0.0765	0.0000
Pd-109	13.700	h	0.02	9.8734E+20	3.7503E+05	0.0121	0.4380	0.0000
Kr-83m	1.8300	h	1.09	1.2658E+20	3.5994E+05	0.0026	0.0382	0.0000
Sm-153	1.9280	d	0.01	3.1438E+21	3.5356E+05	0.0617	0.2700	0.0000
Y-91	58.510	d	0.10	9.4845E+22	3.5148E+05	0.0046	0.6032	0.0000
Te-127	9.3500	h	0.64	4.5793E+20	2.5486E+05	0.0050	0.2245	0.0000
Te-131	25.000	m	0.40	2.0367E+19	2.5437E+05	0.4220	0.7210	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 602
Total activity (Ci) = 2.71931E+08

Total number of decays = 1.07899E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 66.509
Average chain length = 3.5476

Average gamma E (MeV) = 0.55847
Average beta E (MeV) = 0.48846
Average alpha E (MeV) = 4.58950E-20

Composite Exposure Rate Conversion Factor = 10.1013470 R/hr per Ci/m2
Composite ECF per FGR table = 9.26068211 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.98089886 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.03163242 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Xe-135	9.1390	h	0.22	4.1876E+22	2.3844E+07	0.2490	0.3190	0.0000
I-133	20.800	h	0.48	6.8719E+22	1.7192E+07	0.6080	0.4100	0.0000
Nb-97	1.2020	h	0.97	3.8100E+21	1.6495E+07	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	4.9211E+22	1.5298E+07	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	4.0939E+19	1.4553E+07	0.7278	0.0156	0.0000
Y-93	10.180	h	0.79	2.6225E+22	1.3406E+07	0.0919	1.1720	0.0000
Ce-143	1.3800	d	0.15	7.6393E+22	1.2003E+07	0.2750	0.4390	0.0000
Sr-91	9.6310	h	0.52	2.1550E+22	1.1644E+07	1.0480	0.6670	0.0000
I-135	6.5690	h	0.30	1.0546E+22	8.3540E+06	1.6500	0.3770	0.0000
Mo-99	2.7480	d	0.02	1.0492E+23	8.2785E+06	0.1450	0.4080	0.0000
Y-91m	49.720	m	0.08	1.1937E+21	7.4961E+06	0.5283	0.0279	0.0000
Tc-99m	6.0110	h	0.17	8.5715E+21	7.4204E+06	0.1240	0.0142	0.0000
I-132	2.2950	h	0.57	2.6226E+21	5.9467E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	8.5290E+22	5.7719E+06	0.2340	0.1020	0.0000
Y-92	3.5390	h	0.57	3.3986E+21	4.9974E+06	0.2570	1.4300	0.0000
Pr-145	5.9830	h	0.17	4.9310E+21	4.2888E+06	0.0159	0.6770	0.0000
Rh-105	1.4730	d	0.17	2.1907E+22	3.2247E+06	0.0773	0.1521	0.0000
Xe-133	5.2440	d	0.08	7.6660E+22	3.1697E+06	0.0463	0.1360	0.0000
La-141	3.9190	h	0.77	1.8251E+21	2.4234E+06	1.4500	0.9626	0.0000
Ba-140	12.770	d	0.12	1.2866E+23	2.1846E+06	0.1830	0.3100	0.0000
Pm-149	2.2120	d	0.09	1.8452E+22	1.8087E+06	0.0119	0.3670	0.0000
I-131	8.0230	d	0.02	6.2806E+22	1.6974E+06	0.3823	0.1920	0.0000
Xe-135m	15.290	m	0.33	7.0269E+19	1.4349E+06	0.4320	0.0984	0.0000
Sb-128	9.0110	h	0.33	2.0358E+21	1.1757E+06	3.1100	0.5060	0.0000
Te-131m	1.2500	d	0.64	6.1441E+21	1.0658E+06	1.4200	0.0523	0.0000
Pm-151	1.1830	d	0.14	5.4820E+21	1.0048E+06	0.3270	0.3050	0.0000
Nd-147	10.980	d	0.09	4.5976E+22	9.0791E+05	0.1410	0.2690	0.0000
Ce-141	32.500	d	0.03	1.3007E+23	8.6778E+05	0.0771	0.1710	0.0000
Kr-85m	4.4810	h	0.18	7.0796E+20	8.2216E+05	0.1570	0.2282	0.0000
Ru-105	4.4390	h	0.45	6.9406E+20	8.1364E+05	0.7380	0.4104	0.0000
Pr-143	13.560	d	0.07	4.9530E+22	7.9199E+05	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	6.0353E+21	7.7986E+05	2.3200	0.5340	0.0000
Te-129	1.1600	h	0.29	1.1829E+20	5.3066E+05	0.0631	0.5420	0.0000
Zr-95	64.030	d	0.01	1.4284E+23	4.8368E+05	0.7328	0.1200	0.0000
Sb-129	4.3610	h	0.69	3.7645E+20	4.4921E+05	1.3600	0.3940	0.0000
Sr-92	2.7100	h	0.37	2.3358E+20	4.4853E+05	1.3410	0.1770	0.0000
Ru-103	39.260	d	0.05	7.7335E+22	4.2710E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.5923E+19	4.2241E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	9.6147E+22	4.1224E+05	0.0010	0.5830	0.0000
Y-91	58.510	d	0.10	1.0430E+23	3.8651E+05	0.0046	0.6032	0.0000
Sb-127	3.8500	d	1.30	6.7761E+21	3.8162E+05	0.6640	0.3140	0.0000
Rh-88	17.800	m	0.56	2.1090E+19	3.6994E+05	0.6370	2.0700	0.0000
Kr-88	2.8390	h	1.06	1.8074E+20	3.3128E+05	1.9550	0.3616	0.0000
Sm-153	1.9280	d	0.01	2.9198E+21	3.2837E+05	0.0617	0.2700	0.0000
Ag-109m	39.600	s	0.51	6.1781E+17	2.9227E+05	0.0110	0.0765	0.0000
Pd-109	13.700	h	0.02	7.6920E+20	2.9217E+05	0.0121	0.4380	0.0000
Te-127	9.3500	h	0.64	4.9633E+20	2.7624E+05	0.0050	0.2245	0.0000
Rh-105m	40.000	s	0.00	4.9445E+17	2.3157E+05	0.0345	0.0948	0.0000
Te-131	25.000	m	0.40	1.8173E+19	2.2696E+05	0.4220	0.7210	0.0000
Xe-133m	2.1880	d	0.50	2.1506E+21	2.1312E+05	0.0414	0.1920	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 589
Total activity (Ci) = 2.09092E+08

Total number of decays = 1.09464E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 67.474
Average chain length = 3.5476

Average gamma E (MeV) = 0.53037
Average beta E (MeV) = 0.44678
Average alpha E (MeV) = 8.42768E-20

Composite Exposure Rate Conversion Factor = 9.55012226 R/hr per Ci/m2
Composite ECF per FGR table = 9.06566525 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.62957335 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.28840601 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-135	9.1390 h 0.22	3.0190E+22	1.7190E+07	0.2490	0.3190	0.0000	0.0000
I-133	20.800 h 0.48	5.5961E+22	1.4001E+07	0.6080	0.4100	0.0000	0.0000
Nb-97	1.2020 h 0.97	2.9520E+21	1.2780E+07	0.6670	0.4671	0.0000	0.0000
Zr-97	16.740 h 0.07	3.8128E+22	1.1852E+07	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700 s 3.42	3.1719E+19	1.1275E+07	0.7278	0.0156	0.0000	0.0000
Ce-143	1.3800 d 0.15	6.7149E+22	1.0550E+07	0.2750	0.4390	0.0000	0.0000
Y-93	10.180 h 0.79	1.7238E+22	8.8117E+06	0.0919	1.1720	0.0000	0.0000
Mo-99	2.7480 d 0.02	9.8340E+22	7.7593E+06	0.1450	0.4080	0.0000	0.0000
Sr-91	9.6310 h 0.52	1.3830E+22	7.4726E+06	1.0480	0.6670	0.0000	0.0000
Tc-99m	6.0110 h 0.17	8.3433E+21	7.2229E+06	0.1240	0.0142	0.0000	0.0000
I-132	2.2950 h 0.57	2.4819E+21	5.6275E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	8.0681E+22	5.4600E+06	0.2340	0.1020	0.0000	0.0000
Y-91m	49.720 m 0.08	7.6608E+20	4.8108E+06	0.5283	0.0279	0.0000	0.0000
I-135	6.5690 h 0.30	5.5039E+21	4.3600E+06	1.6500	0.3770	0.0000	0.0000
Xe-133	5.2440 d 0.08	8.6461E+22	3.5749E+06	0.0463	0.1360	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.9814E+22	2.9167E+06	0.0773	0.1521	0.0000	0.0000
Ba-140	12.770 d 0.12	1.2688E+23	2.1543E+06	0.1830	0.3100	0.0000	0.0000
Pr-145	5.9830 h 0.17	2.4147E+21	2.1002E+06	0.0159	0.6770	0.0000	0.0000
I-131	8.0230 d 0.02	6.2237E+22	1.6820E+06	0.3823	0.1920	0.0000	0.0000
Pm-149	2.2120 d 0.09	1.7026E+22	1.6690E+06	0.0119	0.3670	0.0000	0.0000
Y-92	3.5390 h 0.57	1.1086E+21	1.6301E+06	0.2570	1.4300	0.0000	0.0000
Pr-143	13.560 d 0.07	5.8066E+22	9.2848E+05	0.0003	0.3151	0.0000	0.0000
Te-131m	1.2500 d 0.64	5.3287E+21	9.2432E+05	1.4200	0.0523	0.0000	0.0000
La-140	1.6780 d 0.01	7.1173E+21	9.1967E+05	2.3200	0.5340	0.0000	0.0000
Nd-147	10.980 d 0.09	4.5237E+22	8.9331E+05	0.1410	0.2690	0.0000	0.0000
Ce-141	32.500 d 0.03	1.3057E+23	8.7110E+05	0.0771	0.1710	0.0000	0.0000
Pm-151	1.1830 d 0.14	4.7163E+21	8.6442E+05	0.3270	0.3050	0.0000	0.0000
La-141	3.9190 h 0.77	6.1365E+20	8.1483E+05	1.4500	0.9626	0.0000	0.0000
Xe-135m	15.290 m 0.33	3.6674E+19	7.4889E+05	0.4320	0.0984	0.0000	0.0000
Sb-128	9.0110 h 0.33	1.2673E+21	7.3184E+05	3.1100	0.5060	0.0000	0.0000
Zr-95	64.030 d 0.01	1.4244E+23	4.8234E+05	0.7328	0.1200	0.0000	0.0000
Ru-103	39.260 d 0.05	7.6985E+22	4.2517E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	7.5580E+19	4.2050E+05	0.0017	0.0375	0.0000	0.0000
Y-91	58.510 d 0.10	1.1212E+23	4.1548E+05	0.0046	0.6032	0.0000	0.0000
Sr-89	50.570 d 0.06	9.5810E+22	4.1080E+05	0.0010	0.5830	0.0000	0.0000
Sb-127	3.8500 d 1.30	6.4711E+21	3.6444E+05	0.6640	0.3140	0.0000	0.0000
Kr-85m	4.4810 h 0.18	2.7291E+20	3.1693E+05	0.1570	0.2282	0.0000	0.0000
Ru-105	4.4390 h 0.45	2.6515E+20	3.1083E+05	0.7380	0.4104	0.0000	0.0000
Sm-153	1.9280 d 0.01	2.6623E+21	2.9941E+05	0.0617	0.2700	0.0000	0.0000
Te-127	9.3500 h 0.64	5.1953E+20	2.8915E+05	0.0050	0.2245	0.0000	0.0000
Xe-133m	2.1880 d 0.50	2.3313E+21	2.3103E+05	0.0414	0.1920	0.0000	0.0000
Ag-109m	39.600 s 0.51	4.5232E+17	2.1398E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700 h 0.02	5.6316E+20	2.1391E+05	0.0121	0.4380	0.0000	0.0000
Te-129	1.1600 h 0.29	4.7265E+19	2.1203E+05	0.0631	0.5420	0.0000	0.0000
Te-131	25.000 m 0.40	1.5761E+19	1.9684E+05	0.4220	0.7210	0.0000	0.0000
Ag-112	3.1310 h 0.29	1.0307E+20	1.7130E+05	0.6950	1.3800	0.0000	0.0000
Sb-129	4.3610 h 0.69	1.4136E+20	1.6868E+05	1.3600	0.3940	0.0000	0.0000
Pd-112	20.300 h 0.99	5.6692E+20	1.4533E+05	0.0051	0.0770	0.0000	0.0000
Sn-121	1.1280 d 0.15	6.5489E+20	1.2588E+05	0.0000	0.1150	0.0000	0.0000
Sr-92	2.7100 h 0.37	4.8294E+19	9.2736E+04	1.3410	0.1770	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 580
Total activity (Ci) = 1.59033E+08

Total number of decays = 1.10960E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 68.395
Average chain length = 3.5476

Average gamma E (MeV) = 0.50763
Average beta E (MeV) = 0.41076
Average alpha E (MeV) = 1.60964E-19

Composite Exposure Rate Conversion Factor = 9.08953190 R/hr per Ci/m2
Composite ECF per FGR table = 8.90107536 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.34541321 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.60909343 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-135	9.1390 h 0.22	1.9082E+22	1.0865E+07	0.2490	0.3190	0.0000	0.0000
I-133	20.800 h 0.48	4.3301E+22	1.0833E+07	0.6080	0.4100	0.0000	0.0000
Nb-97	1.2020 h 0.97	2.1464E+21	9.2923E+06	0.6670	0.4671	0.0000	0.0000
Ce-143	1.3800 d 0.15	5.7159E+22	8.9808E+06	0.2750	0.4390	0.0000	0.0000
Zr-97	16.740 h 0.07	2.7723E+22	8.6179E+06	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700 s 3.42	2.3063E+19	8.1983E+06	0.7278	0.0156	0.0000	0.0000
Mo-99	2.7480 d 0.02	9.0698E+22	7.1564E+06	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	7.8691E+21	6.8124E+06	0.1240	0.0142	0.0000	0.0000
I-132	2.2950 h 0.57	2.3157E+21	5.2507E+06	2.2900	0.4940	0.0000	0.0000
Y-93	10.180 h 0.79	1.0207E+22	5.2176E+06	0.0919	1.1720	0.0000	0.0000
Te-132	3.2040 d 0.41	7.5274E+22	5.0940E+06	0.2340	0.1020	0.0000	0.0000
Sr-91	9.6310 h 0.52	7.9480E+21	4.2944E+06	1.0480	0.6670	0.0000	0.0000
Xe-133	5.2440 d 0.08	9.5142E+22	3.9339E+06	0.0463	0.1360	0.0000	0.0000
Y-91m	49.720 m 0.08	4.4026E+20	2.7647E+06	0.5283	0.0279	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.7209E+22	2.5331E+06	0.0773	0.1521	0.0000	0.0000
Ba-140	12.770 d 0.12	1.2469E+23	2.1171E+06	0.1830	0.3100	0.0000	0.0000
I-135	6.5690 h 0.30	2.4433E+21	1.9355E+06	1.6500	0.3770	0.0000	0.0000
I-131	8.0230 d 0.02	6.1394E+22	1.6592E+06	0.3823	0.1920	0.0000	0.0000
Pm-149	2.2120 d 0.09	1.5399E+22	1.5094E+06	0.0119	0.3670	0.0000	0.0000
Pr-143	13.560 d 0.07	6.7028E+22	1.0718E+06	0.0003	0.3151	0.0000	0.0000
La-140	1.6780 d 0.01	8.2845E+21	1.0705E+06	2.3200	0.5340	0.0000	0.0000
Nd-147	10.980 d 0.09	4.4330E+22	8.7541E+05	0.1410	0.2690	0.0000	0.0000
Ce-141	32.500 d 0.03	1.3013E+23	8.6819E+05	0.0771	0.1710	0.0000	0.0000
Pr-145	5.9830 h 0.17	9.8998E+20	8.6105E+05	0.0159	0.6770	0.0000	0.0000
Te-131m	1.2500 d 0.64	4.4606E+21	7.7374E+05	1.4200	0.0523	0.0000	0.0000
Pm-151	1.1830 d 0.14	3.9084E+21	7.1635E+05	0.3270	0.3050	0.0000	0.0000
Zr-95	64.030 d 0.01	1.4194E+23	4.8067E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	1.1789E+23	4.3686E+05	0.0046	0.6032	0.0000	0.0000
Ru-103	39.260 d 0.05	7.6550E+22	4.2277E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	7.5153E+19	4.1812E+05	0.0017	0.0375	0.0000	0.0000
Sr-89	50.570 d 0.06	9.5389E+22	4.0899E+05	0.0010	0.5830	0.0000	0.0000
Sb-128	9.0110 h 0.33	7.0105E+20	4.0485E+05	3.1100	0.5060	0.0000	0.0000
Y-92	3.5390 h 0.57	2.6240E+20	3.8583E+05	0.2570	1.4300	0.0000	0.0000
Sb-127	3.8500 d 1.30	6.1082E+21	3.4400E+05	0.6640	0.3140	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.6280E+19	3.3245E+05	0.4320	0.0984	0.0000	0.0000
Te-127	9.3500 h 0.64	5.2453E+20	2.9193E+05	0.0050	0.2245	0.0000	0.0000
Sm-153	1.9280 d 0.01	2.3724E+21	2.6681E+05	0.0617	0.2700	0.0000	0.0000
Xe-133m	2.1880 d 0.50	2.4484E+21	2.4263E+05	0.0414	0.1920	0.0000	0.0000
La-141	3.9190 h 0.77	1.5730E+20	2.0887E+05	1.4500	0.9626	0.0000	0.0000
Te-131	25.000 m 0.40	1.3193E+19	1.6477E+05	0.4220	0.7210	0.0000	0.0000
Ag-109m	39.600 s 0.51	3.0643E+17	1.4496E+05	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700 h 0.02	3.8152E+20	1.4492E+05	0.0121	0.4380	0.0000	0.0000
Ag-112	3.1310 h 0.29	7.9435E+19	1.3202E+05	0.6950	1.3800	0.0000	0.0000
Pd-112	20.300 h 0.99	4.3590E+20	1.1174E+05	0.0051	0.0770	0.0000	0.0000
Sn-121	1.1280 d 0.15	5.3775E+20	1.0337E+05	0.0000	0.1150	0.0000	0.0000
Kr-85m	4.4810 h 0.18	8.2979E+19	9.6364E+04	0.1570	0.2282	0.0000	0.0000
Ru-105	4.4390 h 0.45	7.9716E+19	9.3451E+04	0.7380	0.4104	0.0000	0.0000
Pr-144	17.280 m 0.12	4.9415E+18	8.9288E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1736E+23	8.9285E+04	0.0192	0.0918	0.0000	0.0000
In-115m	4.4860 h 0.09	6.6479E+19	7.7117E+04	0.1625	0.0174	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 572
Total activity (Ci) = 1.19730E+08

Total number of decays = 1.12373E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 69.266
Average chain length = 3.5476

Average gamma E (MeV) = 0.49062
Average beta E (MeV) = 0.38065
Average alpha E (MeV) = 3.16946E-19

Composite Exposure Rate Conversion Factor = 8.72648716 R/hr per Ci/m2
Composite ECF per FGR table = 8.76966572 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.13279390 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.00960112 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
I-133	20.800	h	0.48	3.1433E+22	7.8640E+06	0.6080	0.4100	0.0000
Ce-143	1.3800	d	0.15	4.6743E+22	7.3443E+06	0.2750	0.4390	0.0000
Mo-99	2.7480	d	0.02	8.1983E+22	6.4687E+06	0.1450	0.4080	0.0000
Nb-97	1.2020	h	0.97	1.4416E+21	6.2412E+06	0.6670	0.4671	0.0000
Tc-99m	6.0110	h	0.17	7.1935E+21	6.2275E+06	0.1240	0.0142	0.0000
Xe-135	9.1390	h	0.22	1.0250E+22	5.8367E+06	0.2490	0.3190	0.0000
Zr-97	16.740	h	0.07	1.8620E+22	5.7883E+06	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	1.5490E+19	5.5064E+06	0.7278	0.0156	0.0000
I-132	2.2950	d	0.57	2.1235E+21	4.8149E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	6.9026E+22	4.6712E+06	0.2340	0.1020	0.0000
Xe-133	5.2440	d	0.08	1.0176E+23	4.2073E+06	0.0463	0.1360	0.0000
Y-93	10.180	h	0.79	5.3046E+21	2.7116E+06	0.0919	1.1720	0.0000
Sr-91	9.6310	h	0.52	3.9794E+21	2.1501E+06	1.0480	0.6670	0.0000
Rh-105	1.4730	d	0.17	1.4308E+22	2.1061E+06	0.0773	0.1521	0.0000
Ba-140	12.770	d	0.12	1.2201E+23	2.0716E+06	0.1830	0.3100	0.0000
I-131	8.0230	d	0.02	6.0181E+22	1.6264E+06	0.3823	0.1920	0.0000
Y-91m	49.720	m	0.08	2.2043E+20	1.3842E+06	0.5283	0.0279	0.0000
Pm-149	2.2120	d	0.09	1.3582E+22	1.3314E+06	0.0119	0.3670	0.0000
La-140	1.6780	d	0.01	9.4919E+21	1.2265E+06	2.3200	0.5340	0.0000
Pr-143	13.560	d	0.07	7.5976E+22	1.2149E+06	0.0003	0.3151	0.0000
Ce-141	32.500	d	0.03	1.2915E+23	8.6166E+05	0.0771	0.1710	0.0000
Nd-147	10.980	d	0.09	4.3224E+22	8.5355E+05	0.1410	0.2690	0.0000
I-135	6.5690	h	0.30	8.8610E+20	7.0195E+05	1.6500	0.3770	0.0000
Te-131m	1.2500	d	0.64	3.5722E+21	6.1964E+05	1.4200	0.0523	0.0000
Pm-151	1.1830	d	0.14	3.0909E+21	5.6651E+05	0.3270	0.3050	0.0000
Zr-95	64.030	d	0.01	1.4133E+23	4.7859E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.2151E+23	4.5027E+05	0.0046	0.6032	0.0000
Ru-103	39.260	d	0.05	7.6011E+22	4.1979E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.4624E+19	4.1518E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	9.4867E+22	4.0675E+05	0.0010	0.5830	0.0000
Sb-127	3.8500	d	1.30	5.6833E+21	3.2007E+05	0.6640	0.3140	0.0000
Te-127	9.3500	h	0.64	5.1061E+20	2.8419E+05	0.0050	0.2245	0.0000
Pr-145	5.9830	h	0.17	3.2508E+20	2.8275E+05	0.0159	0.6770	0.0000
Xe-133m	2.1880	d	0.50	2.4733E+21	2.4510E+05	0.0414	0.1920	0.0000
Sm-153	1.9280	d	0.01	2.0543E+21	2.3103E+05	0.0617	0.2700	0.0000
Sb-128	9.0110	h	0.33	3.3469E+20	1.9328E+05	3.1100	0.5060	0.0000
Te-131	25.000	m	0.40	1.0566E+19	1.3196E+05	0.4220	0.7210	0.0000
Xe-135m	15.290	m	0.33	5.9043E+18	1.2057E+05	0.4320	0.0984	0.0000
Ag-112	3.1310	h	0.29	5.7244E+19	9.5142E+04	0.6950	1.3800	0.0000
Pr-144	17.280	m	0.12	4.9367E+18	8.9201E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1724E+23	8.9198E+04	0.0192	0.0918	0.0000
Ag-109m	39.600	s	0.51	1.8842E+17	8.9135E+04	0.0110	0.0765	0.0000
Pd-109	13.700	h	0.02	2.3459E+20	8.9106E+04	0.0121	0.4380	0.0000
Sn-121	1.1280	d	0.15	4.2044E+20	8.0817E+04	0.0000	0.1150	0.0000
Pd-112	20.300	h	0.99	3.1394E+20	8.0477E+04	0.0051	0.0770	0.0000
In-115m	4.4860	h	0.09	5.8887E+19	6.8309E+04	0.1625	0.0174	0.0000
Cd-115	2.2280	d	0.19	6.4377E+20	6.2650E+04	0.2020	0.4930	0.0000
Y-92	3.5390	h	0.57	4.1852E+19	6.1540E+04	0.2570	1.4300	0.0000
As-77	1.6180	d	0.13	3.1960E+20	4.2829E+04	0.0083	0.2254	0.0000
Ag-111	7.4500	d	0.13	1.4518E+21	4.2254E+04	0.0270	0.3550	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 561
Total activity (Ci) = 8.95546E+07

Total number of decays = 1.13696E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 70.082
Average chain length = 3.5476

Average gamma E (MeV) = 0.47950
Average beta E (MeV) = 0.35413
Average alpha E (MeV) = 6.36676E-19

Composite Exposure Rate Conversion Factor = 8.46288300 R/hr per Ci/m2
Composite ECF per FGR table = 8.68691635 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.99368715 Rem/hr per Ci/m2

Fission Product Source

Point in time = 2.50979114 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ce-143	1.3800 d 0.15	3.6359E+22	5.7127E+06	0.2750	0.4390	0.0000	0.0000
Mo-99	2.7480 d 0.02	7.2266E+22	5.7020E+06	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	6.3701E+21	5.5147E+06	0.1240	0.0142	0.0000	0.0000
I-133	20.800 h 0.48	2.1069E+22	5.2711E+06	0.6080	0.4100	0.0000	0.0000
Xe-133	5.2440 d 0.08	1.0534E+23	4.3556E+06	0.0463	0.1360	0.0000	0.0000
I-132	2.2950 h 0.57	1.9057E+21	4.3211E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	6.1947E+22	4.1921E+06	0.2340	0.1020	0.0000	0.0000
Nb-97	1.2020 h 0.97	8.7696E+20	3.7966E+06	0.6670	0.4671	0.0000	0.0000
Zr-97	16.740 h 0.07	1.1327E+22	3.5211E+06	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700 s 3.42	9.4229E+18	3.3496E+06	0.7278	0.0156	0.0000	0.0000
Xe-135	9.1390 h 0.22	4.5061E+21	2.5658E+06	0.2490	0.3190	0.0000	0.0000
Ba-140	12.770 d 0.12	1.1874E+23	2.0161E+06	0.1830	0.3100	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.1320E+22	1.6663E+06	0.0773	0.1521	0.0000	0.0000
I-131	8.0230 d 0.02	5.8485E+22	1.5806E+06	0.3823	0.1920	0.0000	0.0000
La-140	1.6780 d 0.01	1.0671E+22	1.3789E+06	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	8.4306E+22	1.3481E+06	0.0003	0.3151	0.0000	0.0000
Y-93	10.180 h 0.79	2.3425E+21	1.1974E+06	0.0919	1.1720	0.0000	0.0000
Pm-149	2.2120 d 0.09	1.1612E+22	1.1382E+06	0.0119	0.3670	0.0000	0.0000
Sr-91	9.6310 h 0.52	1.6772E+21	9.0625E+05	1.0480	0.6670	0.0000	0.0000
Ce-141	32.500 d 0.03	1.2781E+23	8.5269E+05	0.0771	0.1710	0.0000	0.0000
Nd-147	10.980 d 0.09	4.1880E+22	8.2702E+05	0.1410	0.2690	0.0000	0.0000
Y-91m	49.720 m 0.08	9.2908E+19	5.8343E+05	0.5283	0.0279	0.0000	0.0000
Zr-95	64.030 d 0.01	1.4057E+23	4.7601E+05	0.7328	0.1200	0.0000	0.0000
Te-131m	1.2500 d 0.64	2.7070E+21	4.6955E+05	1.4200	0.0523	0.0000	0.0000
Y-91	58.510 d 0.10	1.2321E+23	4.5659E+05	0.0046	0.6032	0.0000	0.0000
Pm-151	1.1830 d 0.14	2.3057E+21	4.2260E+05	0.3270	0.3050	0.0000	0.0000
Ru-103	39.260 d 0.05	7.5343E+22	4.1610E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	7.3968E+19	4.1153E+05	0.0017	0.0375	0.0000	0.0000
Sr-89	50.570 d 0.06	9.4219E+22	4.0398E+05	0.0010	0.5830	0.0000	0.0000
Sb-127	3.8500 d 1.30	5.1939E+21	2.9251E+05	0.6640	0.3140	0.0000	0.0000
Te-127	9.3500 h 0.64	4.7952E+20	2.6688E+05	0.0050	0.2245	0.0000	0.0000
Xe-133m	2.1880 d 0.50	2.3826E+21	2.3611E+05	0.0414	0.1920	0.0000	0.0000
I-135	6.5690 h 0.30	2.4967E+20	1.9778E+05	1.6500	0.3770	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.7162E+21	1.9300E+05	0.0617	0.2700	0.0000	0.0000
Te-131	25.000 m 0.40	8.0065E+18	9.9995E+04	0.4220	0.7210	0.0000	0.0000
Pr-144	17.280 m 0.12	4.9307E+18	8.9092E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1710E+23	8.9089E+04	0.0192	0.0918	0.0000	0.0000
Sb-128	9.0110 h 0.33	1.3292E+20	7.6763E+04	3.1100	0.5060	0.0000	0.0000
Pr-145	5.9830 h 0.17	8.0909E+19	7.0372E+04	0.0159	0.6770	0.0000	0.0000
Ag-112	3.1310 h 0.29	3.7998E+19	6.3154E+04	0.6950	1.3800	0.0000	0.0000
Sn-121	1.1280 d 0.15	3.0918E+20	5.9432E+04	0.0000	0.1150	0.0000	0.0000
In-115m	4.4860 h 0.09	5.0448E+19	5.8520E+04	0.1625	0.0174	0.0000	0.0000
Cd-115	2.2280 d 0.19	5.5099E+20	5.3622E+04	0.2020	0.4930	0.0000	0.0000
Pd-112	20.300 h 0.99	2.0837E+20	5.3414E+04	0.0051	0.0770	0.0000	0.0000
Ag-109m	39.600 s 0.51	1.0265E+17	4.8559E+04	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700 h 0.02	1.2780E+20	4.8544E+04	0.0121	0.4380	0.0000	0.0000
Ag-111	7.4500 d 0.13	1.3858E+21	4.0333E+04	0.0270	0.3550	0.0000	0.0000
As-77	1.6180 d 0.13	2.6261E+20	3.5192E+04	0.0083	0.2254	0.0000	0.0000
Xe-135m	15.290 m 0.33	1.6636E+18	3.3972E+04	0.4320	0.0984	0.0000	0.0000
Te-129m	33.600 d 0.30	4.9115E+21	3.1695E+04	0.0373	0.2660	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 553
Total activity (Ci) = 6.71442E+07

Total number of decays = 1.14933E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 70.845
Average chain length = 3.5476

Average gamma E (MeV) = 0.47386
Average beta E (MeV) = 0.32965
Average alpha E (MeV) = 1.28640E-18

Composite Exposure Rate Conversion Factor = 8.29058266 R/hr per Ci/m2
Composite ECF per FGR table = 8.65874577 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.92324400 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.13448501 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Mo-99	2.7480 d 0.02	6.1731E+22	4.8707E+06	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	5.4493E+21	4.7175E+06	0.1240	0.0142	0.0000	0.0000
Xe-133	5.2440 d 0.08	1.0512E+23	4.3466E+06	0.0463	0.1360	0.0000	0.0000
Ce-143	1.3800 d 0.15	2.6567E+22	4.1742E+06	0.2750	0.4390	0.0000	0.0000
I-132	2.2950 h 0.57	1.6648E+21	3.7749E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	5.4116E+22	3.6622E+06	0.2340	0.1020	0.0000	0.0000
I-133	20.800 h 0.48	1.2784E+22	3.1983E+06	0.6080	0.4100	0.0000	0.0000
Nb-97	1.2020 h 0.97	4.7138E+20	2.0407E+06	0.6670	0.4671	0.0000	0.0000
Ba-140	12.770 d 0.12	1.1478E+23	1.9489E+06	0.1830	0.3100	0.0000	0.0000
Zr-97	16.740 h 0.07	6.0884E+21	1.8926E+06	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700 s 3.42	5.0650E+18	1.8005E+06	0.7278	0.0156	0.0000	0.0000
I-131	8.0230 d 0.02	5.6184E+22	1.5184E+06	0.3823	0.1920	0.0000	0.0000
La-140	1.6780 d 0.01	1.1731E+22	1.5158E+06	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	9.1285E+22	1.4597E+06	0.0003	0.3151	0.0000	0.0000
Rh-105	1.4730 d 0.17	8.4390E+21	1.2422E+06	0.0773	0.1521	0.0000	0.0000
Pm-149	2.2120 d 0.09	9.5475E+21	9.3587E+05	0.0119	0.3670	0.0000	0.0000
Xe-135	9.1390 h 0.22	1.5481E+21	8.8152E+05	0.2490	0.3190	0.0000	0.0000
Ce-141	32.500 d 0.03	1.2612E+23	8.4142E+05	0.0771	0.1710	0.0000	0.0000
Nd-147	10.980 d 0.09	4.0261E+22	7.9504E+05	0.1410	0.2690	0.0000	0.0000
Zr-95	64.030 d 0.01	1.3962E+23	4.7280E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	1.2346E+23	4.5753E+05	0.0046	0.6032	0.0000	0.0000
Y-93	10.180 h 0.79	8.4397E+20	4.3142E+05	0.0919	1.1720	0.0000	0.0000
Ru-103	39.260 d 0.05	7.4516E+22	4.1154E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	7.3156E+19	4.0701E+05	0.0017	0.0375	0.0000	0.0000
Sr-89	50.570 d 0.06	9.3416E+22	4.0053E+05	0.0010	0.5830	0.0000	0.0000
Te-131m	1.2500 d 0.64	1.9144E+21	3.3208E+05	1.4200	0.0523	0.0000	0.0000
Sr-91	9.6310 h 0.52	5.7014E+20	3.0806E+05	1.0480	0.6670	0.0000	0.0000
Pm-151	1.1830 d 0.14	1.5990E+21	2.9307E+05	0.3270	0.3050	0.0000	0.0000
Sb-127	3.8500 d 1.30	4.6414E+21	2.6139E+05	0.6640	0.3140	0.0000	0.0000
Te-127	9.3500 h 0.64	4.3475E+20	2.4196E+05	0.0050	0.2245	0.0000	0.0000
Xe-133m	2.1880 d 0.50	2.1672E+21	2.1477E+05	0.0414	0.1920	0.0000	0.0000
Y-91m	49.720 m 0.08	3.1582E+19	1.9832E+05	0.5283	0.0279	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.3710E+21	1.5418E+05	0.0617	0.2700	0.0000	0.0000
Pr-144	17.280 m 0.12	4.9232E+18	8.8957E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1692E+23	8.8954E+04	0.0192	0.0918	0.0000	0.0000
Te-131	25.000 m 0.40	5.6624E+18	7.0719E+04	0.4220	0.7210	0.0000	0.0000
In-115m	4.4860 h 0.09	4.1545E+19	4.8193E+04	0.1625	0.0174	0.0000	0.0000
Cd-115	2.2280 d 0.19	4.5367E+20	4.4151E+04	0.2020	0.4930	0.0000	0.0000
I-135	6.5690 h 0.30	5.1323E+19	4.0657E+04	1.6500	0.3770	0.0000	0.0000
Sn-121	1.1280 d 0.15	2.1062E+20	4.0486E+04	0.0000	0.1150	0.0000	0.0000
Ag-111	7.4500 d 0.13	1.3076E+21	3.8056E+04	0.0270	0.3550	0.0000	0.0000
Ag-112	3.1310 h 0.29	2.2774E+19	3.7851E+04	0.6950	1.3800	0.0000	0.0000
Pd-112	20.300 h 0.99	1.2488E+20	3.2013E+04	0.0051	0.0770	0.0000	0.0000
Te-129m	33.600 d 0.30	4.8488E+21	3.1290E+04	0.0373	0.2660	0.0000	0.0000
Nb-95	34.990 d 0.02	4.6185E+21	2.8620E+04	0.7645	0.0434	0.0000	0.0000
As-77	1.6180 d 0.13	2.0344E+20	2.7263E+04	0.0083	0.2254	0.0000	0.0000
Sb-128	9.0110 h 0.33	4.1951E+19	2.4227E+04	3.1100	0.5060	0.0000	0.0000
Ag-109m	39.600 s 0.51	4.8074E+16	2.2742E+04	0.0110	0.0765	0.0000	0.0000
Pd-109	13.700 h 0.02	5.9855E+19	2.2735E+04	0.0121	0.4380	0.0000	0.0000
Te-129	1.1600 h 0.29	4.4379E+18	1.9909E+04	0.0631	0.5420	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867385D+24

Total number of nuclides = 543
Total activity (Ci) = 5.10085E+07

Total number of decays = 1.16098E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 71.563
Average chain length = 3.5476

Average gamma E (MeV) = 0.47285
Average beta E (MeV) = 0.30819
Average alpha E (MeV) = 2.57613E-18

Composite Exposure Rate Conversion Factor = 8.19685364 R/hr per Ci/m2
Composite ECF per FGR table = 8.67629814 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.91063643 Rem/hr per Ci/m2

Fission Product Source

Point in time = 3.91466618 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440	d	0.08	1.0074E+23	4.1654E+06	0.0463	0.1360	0.0000
Mo-99	2.7480	d	0.02	5.0703E+22	4.0006E+06	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	4.4773E+21	3.8760E+06	0.1240	0.0142	0.0000
I-132	2.2950	h	0.57	1.4062E+21	3.1886E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	4.5711E+22	3.0934E+06	0.2340	0.1020	0.0000
Ce-143	1.3800	d	0.15	1.7954E+22	2.8209E+06	0.2750	0.4390	0.0000
Ba-140	12.770	d	0.12	1.1002E+23	1.8681E+06	0.1830	0.3100	0.0000
I-133	20.800	h	0.48	6.8497E+21	1.7137E+06	0.6080	0.4100	0.0000
La-140	1.6780	d	0.01	1.2563E+22	1.6233E+06	2.3200	0.5340	0.0000
Pr-143	13.560	d	0.07	9.6149E+22	1.5374E+06	0.0003	0.3151	0.0000
I-131	8.0230	d	0.02	5.3173E+22	1.4370E+06	0.3823	0.1920	0.0000
Nb-97	1.2020	h	0.97	2.1710E+20	9.3988E+05	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	2.8041E+21	8.7167E+05	0.1800	0.7020	0.0000
Rh-105	1.4730	d	0.17	5.8460E+21	8.6054E+05	0.0773	0.1521	0.0000
Nb-97m	52.700	s	3.42	2.3327E+18	8.2923E+05	0.7278	0.0156	0.0000
Ce-141	32.500	d	0.03	1.2404E+23	8.2754E+05	0.0771	0.1710	0.0000
Nd-147	10.980	d	0.09	3.8326E+22	7.5683E+05	0.1410	0.2690	0.0000
Pm-149	2.2120	d	0.09	7.4768E+21	7.3289E+05	0.0119	0.3670	0.0000
Zr-95	64.030	d	0.01	1.3845E+23	4.6882E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.2277E+23	4.5496E+05	0.0046	0.6032	0.0000
Ru-103	39.260	d	0.05	7.3497E+22	4.0591E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.2156E+19	4.0144E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	9.2422E+22	3.9627E+05	0.0010	0.5830	0.0000
Sb-127	3.8500	d	1.30	4.0331E+21	2.2714E+05	0.6640	0.3140	0.0000
Xe-135	9.1390	h	0.22	3.9306E+20	2.2381E+05	0.2490	0.3190	0.0000
Te-131m	1.2500	d	0.64	1.2421E+21	2.1545E+05	1.4200	0.0523	0.0000
Te-127	9.3500	h	0.64	3.8045E+20	2.1174E+05	0.0050	0.2245	0.0000
Pm-151	1.1830	d	0.14	1.0123E+21	1.8554E+05	0.3270	0.3050	0.0000
Xe-133m	2.1880	d	0.50	1.8406E+21	1.8240E+05	0.0414	0.1920	0.0000
Y-93	10.180	h	0.79	2.3585E+20	1.2056E+05	0.0919	1.1720	0.0000
Sm-153	1.9280	d	0.01	1.0356E+21	1.1647E+05	0.0617	0.2700	0.0000
Pr-144	17.280	m	0.12	4.9139E+18	8.8788E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1670E+23	8.8785E+04	0.0192	0.0918	0.0000
Sr-91	9.6310	h	0.52	1.4816E+20	8.0053E+04	1.0480	0.6670	0.0000
Y-91m	49.720	m	0.08	8.2069E+18	5.1537E+04	0.5283	0.0279	0.0000
Te-131	25.000	m	0.40	3.6738E+18	4.5883E+04	0.4220	0.7210	0.0000
In-115m	4.4860	h	0.09	3.2593E+19	3.7808E+04	0.1625	0.0174	0.0000
Ag-111	7.4500	d	0.13	1.2160E+21	3.5391E+04	0.0270	0.3550	0.0000
Nb-95	34.990	d	0.02	5.7062E+21	3.5360E+04	0.7645	0.0434	0.0000
Cd-115	2.2280	d	0.19	3.5590E+20	3.4636E+04	0.2020	0.4930	0.0000
Te-129m	33.600	d	0.30	4.7714E+21	3.0791E+04	0.0373	0.2660	0.0000
Sn-121	1.1280	d	0.15	1.3041E+20	2.5067E+04	0.0000	0.1150	0.0000
Ag-112	3.1310	h	0.29	1.2016E+19	1.9972E+04	0.6950	1.3800	0.0000
As-77	1.6180	d	0.13	1.4672E+20	1.9662E+04	0.0083	0.2254	0.0000
Te-129	1.1600	h	0.29	4.3322E+18	1.9435E+04	0.0631	0.5420	0.0000
Pd-112	20.300	h	0.99	6.5893E+19	1.6891E+04	0.0051	0.0770	0.0000
Sn-125	9.6400	d	0.31	7.0991E+20	1.5967E+04	0.3140	0.8110	0.0000
Rh-106	30.000	s	0.67	1.4844E+16	9270.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5927E+22	9270.	0.0000	0.0100	0.0000
Ag-109m	39.600	s	0.51	1.8641E+16	8819.	0.0110	0.0765	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867384D+24

Total number of nuclides = 532
Total activity (Ci) = 3.94900E+07

Total number of decays = 1.17213E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 72.250
Average chain length = 3.5476

Average gamma E (MeV) = 0.47568
Average beta E (MeV) = 0.29186
Average alpha E (MeV) = 5.06900E-18

Composite Exposure Rate Conversion Factor = 8.17655182 R/hr per Ci/m2
Composite ECF per FGR table = 8.73210049 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.94594669 Rem/hr per Ci/m2

Fission Product Source

Point in time = 4.88902712 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440	d	0.08	9.2394E+22	3.8202E+06	0.0463	0.1360	0.0000
Mo-99	2.7480	d	0.02	3.9655E+22	3.1289E+06	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	3.5019E+21	3.0316E+06	0.1240	0.0142	0.0000
I-132	2.2950	h	0.57	1.1390E+21	2.5826E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	3.7024E+22	2.5055E+06	0.2340	0.1020	0.0000
Ba-140	12.770	d	0.12	1.0435E+23	1.7719E+06	0.1830	0.3100	0.0000
Ce-143	1.3800	d	0.15	1.1005E+22	1.7292E+06	0.2750	0.4390	0.0000
La-140	1.6780	d	0.01	1.3058E+22	1.6873E+06	2.3200	0.5340	0.0000
Pr-143	13.560	d	0.07	9.8242E+22	1.5709E+06	0.0003	0.3151	0.0000
I-131	8.0230	d	0.02	4.9377E+22	1.3344E+06	0.3823	0.1920	0.0000
Ce-141	32.500	d	0.03	1.2149E+23	8.1052E+05	0.0771	0.1710	0.0000
I-133	20.800	h	0.48	3.1422E+21	7.8613E+05	0.6080	0.4100	0.0000
Nd-147	10.980	d	0.09	3.6039E+22	7.1168E+05	0.1410	0.2690	0.0000
Rh-105	1.4730	d	0.17	3.6961E+21	5.4406E+05	0.0773	0.1521	0.0000
Pm-149	2.2120	d	0.09	5.5096E+21	5.4006E+05	0.0119	0.3670	0.0000
Zr-95	64.030	d	0.01	1.3699E+23	4.6390E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.2149E+23	4.5021E+05	0.0046	0.6032	0.0000
Ru-103	39.260	d	0.05	7.2243E+22	3.9899E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	7.0925E+19	3.9460E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	9.1196E+22	3.9101E+05	0.0010	0.5830	0.0000
Nb-97	1.2020	h	0.97	8.2440E+19	3.5691E+05	0.6670	0.4671	0.0000
Zr-97	16.740	h	0.07	1.0648E+21	3.3100E+05	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	8.8582E+17	3.1489E+05	0.7278	0.0156	0.0000
Sb-127	3.8500	d	1.30	3.3842E+21	1.9059E+05	0.6640	0.3140	0.0000
Te-127	9.3500	h	0.64	3.2053E+20	1.7839E+05	0.0050	0.2245	0.0000
Xe-133m	2.1880	d	0.50	1.4409E+21	1.4279E+05	0.0414	0.1920	0.0000
Te-131m	1.2500	d	0.64	7.2361E+20	1.2552E+05	1.4200	0.0523	0.0000
Pm-151	1.1830	d	0.14	5.7197E+20	1.0483E+05	0.3270	0.3050	0.0000
Pr-144	17.280	m	0.12	4.9023E+18	8.8578E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1643E+23	8.8575E+04	0.0192	0.0918	0.0000
Sm-153	1.9280	d	0.01	7.2959E+20	8.2050E+04	0.0617	0.2700	0.0000
Nb-95	34.990	d	0.02	7.0288E+21	4.3556E+04	0.7645	0.0434	0.0000
Xe-135	9.1390	h	0.22	6.8871E+19	3.9215E+04	0.2490	0.3190	0.0000
Ag-111	7.4500	d	0.13	1.1106E+21	3.2324E+04	0.0270	0.3550	0.0000
Te-129m	33.600	d	0.30	4.6765E+21	3.0178E+04	0.0373	0.2660	0.0000
In-115m	4.4860	h	0.09	2.4070E+19	2.7921E+04	0.1625	0.0174	0.0000
Te-131	25.000	m	0.40	2.1403E+18	2.6730E+04	0.4220	0.7210	0.0000
Cd-115	2.2280	d	0.19	2.6283E+20	2.5579E+04	0.2020	0.4930	0.0000
Y-93	10.180	h	0.79	4.7988E+19	2.4531E+04	0.0919	1.1720	0.0000
Te-129	1.1600	h	0.29	4.2442E+18	1.9040E+04	0.0631	0.5420	0.0000
Sn-125	9.6400	d	0.31	6.6188E+20	1.4887E+04	0.3140	0.8110	0.0000
Sr-91	9.6310	h	0.52	2.7530E+19	1.4875E+04	1.0480	0.6670	0.0000
Sn-121	1.1280	d	0.15	7.1663E+19	1.3775E+04	0.0000	0.1150	0.0000
As-77	1.6180	d	0.13	9.7015E+19	1.3001E+04	0.0083	0.2254	0.0000
Y-91m	49.720	m	0.08	1.5250E+18	9576.	0.5283	0.0279	0.0000
Rh-106	30.000	s	0.67	1.4817E+16	9253.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5898E+22	9253.	0.0000	0.0100	0.0000
Ag-112	3.1310	h	0.29	5.4076E+18	8988.	0.6950	1.3800	0.0000
Pd-112	20.300	h	0.99	2.9653E+19	7601.	0.0051	0.0770	0.0000
Eu-156	15.190	d	0.53	4.7243E+20	6744.	1.3300	0.4250	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867387D+24

Total number of nuclides = 517
Total activity (Ci) = 3.10745E+07

Total number of decays = 1.18301E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 72.921
Average chain length = 3.5476

Average gamma E (MeV) = 0.48176
Average beta E (MeV) = 0.28178
Average alpha E (MeV) = 9.80353E-18

Composite Exposure Rate Conversion Factor = 8.23032856 R/hr per Ci/m2
Composite ECF per FGR table = 8.82706738 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.02197123 Rem/hr per Ci/m2

Fission Product Source

Point in time = 6.10591888 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440	d	0.08	8.0832E+22	3.3422E+06	0.0463	0.1360	0.0000
Mo-99	2.7480	d	0.02	2.9174E+22	2.3019E+06	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	2.5763E+21	2.2303E+06	0.1240	0.0142	0.0000
I-132	2.2950	h	0.57	8.7535E+20	1.9848E+06	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	2.8454E+22	1.9256E+06	0.2340	0.1020	0.0000
La-140	1.6780	d	0.01	1.3127E+22	1.6962E+06	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	9.7685E+22	1.6586E+06	0.1830	0.3100	0.0000
Pr-143	13.560	d	0.07	9.7181E+22	1.5539E+06	0.0003	0.3151	0.0000
I-131	8.0230	d	0.02	4.4785E+22	1.2103E+06	0.3823	0.1920	0.0000
Ce-143	1.3800	d	0.15	5.9725E+21	9.3840E+05	0.2750	0.4390	0.0000
Ce-141	32.500	d	0.03	1.1838E+23	7.8975E+05	0.0771	0.1710	0.0000
Nd-147	10.980	d	0.09	3.3375E+22	6.5906E+05	0.1410	0.2690	0.0000
Zr-95	64.030	d	0.01	1.3520E+23	4.5783E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.1977E+23	4.4386E+05	0.0046	0.6032	0.0000
Ru-103	39.260	d	0.05	7.0708E+22	3.9050E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	6.9417E+19	3.8621E+05	0.0017	0.0375	0.0000
Sr-89	50.570	d	0.06	8.9687E+22	3.8455E+05	0.0010	0.5830	0.0000
Pm-149	2.2120	d	0.09	3.7628E+21	3.6884E+05	0.0119	0.3670	0.0000
Rh-105	1.4730	d	0.17	2.0847E+21	3.0687E+05	0.0773	0.1521	0.0000
I-133	20.800	h	0.48	1.1873E+21	2.9704E+05	0.6080	0.4100	0.0000
Sb-127	3.8500	d	1.30	2.7184E+21	1.5309E+05	0.6640	0.3140	0.0000
Te-127	9.3500	h	0.64	2.5845E+20	1.4384E+05	0.0050	0.2245	0.0000
Nb-97	1.2020	h	0.97	2.4601E+19	1.0650E+05	0.6670	0.4671	0.0000
Xe-133m	2.1880	d	0.50	1.0248E+21	1.0155E+05	0.0414	0.1920	0.0000
Zr-97	16.740	h	0.07	3.1774E+20	9.8774E+04	0.1800	0.7020	0.0000
Nb-97m	52.700	s	3.42	2.6433E+17	9.3965E+04	0.7278	0.0156	0.0000
Pr-144	17.280	m	0.12	4.8878E+18	8.8316E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1608E+23	8.8313E+04	0.0192	0.0918	0.0000
Te-131m	1.2500	d	0.64	3.6851E+20	6.3922E+04	1.4200	0.0523	0.0000
Nb-95	34.990	d	0.02	8.6256E+21	5.3451E+04	0.7645	0.0434	0.0000
Sm-153	1.9280	d	0.01	4.7106E+20	5.2976E+04	0.0617	0.2700	0.0000
Pm-151	1.1830	d	0.14	2.8036E+20	5.1386E+04	0.3270	0.3050	0.0000
Te-129m	33.600	d	0.30	4.5605E+21	2.9430E+04	0.0373	0.2660	0.0000
Ag-111	7.4500	d	0.13	9.9175E+20	2.8864E+04	0.0270	0.3550	0.0000
In-115m	4.4860	h	0.09	1.6484E+19	1.9121E+04	0.1625	0.0174	0.0000
Te-129	1.1600	h	0.29	4.1389E+18	1.8567E+04	0.0631	0.5420	0.0000
Cd-115	2.2280	d	0.19	1.8000E+20	1.7517E+04	0.2020	0.4930	0.0000
Sn-125	9.6400	d	0.31	6.0643E+20	1.3640E+04	0.3140	0.8110	0.0000
Te-131	25.000	m	0.40	1.0900E+18	1.3613E+04	0.4220	0.7210	0.0000
Rh-106	30.000	s	0.67	1.4784E+16	9232.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5863E+22	9232.	0.0000	0.0100	0.0000
As-77	1.6180	d	0.13	5.7689E+19	7731.	0.0083	0.2254	0.0000
Sn-121	1.1280	d	0.15	3.3929E+19	6522.	0.0000	0.1150	0.0000
Eu-156	15.190	d	0.53	4.4700E+20	6381.	1.3300	0.4250	0.0000
Xe-131m	11.930	d	0.13	2.6587E+20	4832.	0.0200	0.1430	0.0000
Xe-135	9.1390	h	0.22	7.6534E+18	4358.	0.2490	0.3190	0.0000
Cs-136	13.030	d	0.54	2.2341E+20	3718.	2.1700	0.1350	0.0000
Pm-147	2.6231	y	0.01	1.5614E+22	3534.	0.0000	0.0620	0.0000
Nb-95m	3.6090	d	0.92	5.8357E+19	3506.	0.0712	0.1710	0.0000
Y-93	10.180	h	0.79	6.5692E+18	3358.	0.0919	1.1720	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 516
Total activity (Ci) = 2.46545E+07

Total number of decays = 1.19375E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 73.583
Average chain length = 3.5476

Average gamma E (MeV) = 0.49003
Average beta E (MeV) = 0.27756
Average alpha E (MeV) = 1.87515E-17

Composite Exposure Rate Conversion Factor = 8.34536362 R/hr per Ci/m2
Composite ECF per FGR table = 8.95312595 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.12540483 Rem/hr per Ci/m2

Fission Product Source

Point in time = 7.62569809 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440 d 0.08	6.7199E+22	2.7785E+06	0.0463	0.1360	0.0000	0.0000
La-140	1.6780 d 0.01	1.2726E+22	1.6445E+06	2.3200	0.5340	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.9884E+22	1.5689E+06	0.1450	0.4080	0.0000	0.0000
Ba-140	12.770 d 0.12	8.9950E+22	1.5273E+06	0.1830	0.3100	0.0000	0.0000
Tc-99m	6.0110 h 0.17	1.7559E+21	1.5201E+06	0.1240	0.0142	0.0000	0.0000
Pr-143	13.560 d 0.07	9.2971E+22	1.4866E+06	0.0003	0.3151	0.0000	0.0000
I-132	2.2950 h 0.57	6.3008E+20	1.4287E+06	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	2.0481E+22	1.3860E+06	0.2340	0.1020	0.0000	0.0000
I-131	8.0230 d 0.02	3.9470E+22	1.0667E+06	0.3823	0.1920	0.0000	0.0000
Ce-141	32.500 d 0.03	1.1460E+23	7.6457E+05	0.0771	0.1710	0.0000	0.0000
Nd-147	10.980 d 0.09	3.0321E+22	5.9877E+05	0.1410	0.2690	0.0000	0.0000
Zr-95	64.030 d 0.01	1.3299E+23	4.5036E+05	0.7328	0.1200	0.0000	0.0000
Ce-143	1.3800 d 0.15	2.7838E+21	4.3739E+05	0.2750	0.4390	0.0000	0.0000
Y-91	58.510 d 0.10	1.1764E+23	4.3595E+05	0.0046	0.6032	0.0000	0.0000
Ru-103	39.260 d 0.05	6.8836E+22	3.8017E+05	0.4850	0.1100	0.0000	0.0000
Sr-89	50.570 d 0.06	8.7838E+22	3.7662E+05	0.0010	0.5830	0.0000	0.0000
Rh-103m	56.120 m 0.00	6.7580E+19	3.7598E+05	0.0017	0.0375	0.0000	0.0000
Pm-149	2.2120 d 0.09	2.3371E+21	2.2909E+05	0.0119	0.3670	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.0197E+21	1.5009E+05	0.0773	0.1521	0.0000	0.0000
Sb-127	3.8500 d 1.30	2.0677E+21	1.1645E+05	0.6640	0.3140	0.0000	0.0000
Te-127	9.3500 h 0.64	1.9767E+20	1.1001E+05	0.0050	0.2245	0.0000	0.0000
I-133	20.800 h 0.48	3.5211E+20	8.8092E+04	0.6080	0.4100	0.0000	0.0000
Pr-144	17.280 m 0.12	4.8698E+18	8.7991E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1565E+23	8.7988E+04	0.0192	0.0918	0.0000	0.0000
Nb-95	34.990 d 0.02	1.0536E+22	6.5290E+04	0.7645	0.0434	0.0000	0.0000
Xe-133m	2.1880 d 0.50	6.5120E+20	6.4532E+04	0.0414	0.1920	0.0000	0.0000
Sm-153	1.9280 d 0.01	2.7276E+20	3.0675E+04	0.0617	0.2700	0.0000	0.0000
Te-129m	33.600 d 0.30	4.4198E+21	2.8521E+04	0.0373	0.2660	0.0000	0.0000
Te-131m	1.2500 d 0.64	1.5865E+20	2.7520E+04	1.4200	0.0523	0.0000	0.0000
Ag-111	7.4500 d 0.13	8.6098E+20	2.5058E+04	0.0270	0.3550	0.0000	0.0000
Nb-97	1.2020 h 0.97	5.4329E+18	2.3521E+04	0.6670	0.4671	0.0000	0.0000
Zr-97	16.740 h 0.07	7.0172E+19	2.1814E+04	0.1800	0.7020	0.0000	0.0000
Pm-151	1.1830 d 0.14	1.1508E+20	2.1092E+04	0.3270	0.3050	0.0000	0.0000
Nb-97m	52.700 s 3.42	5.8377E+16	2.0752E+04	0.7278	0.0156	0.0000	0.0000
Te-129	1.1600 h 0.29	4.0112E+18	1.7994E+04	0.0631	0.5420	0.0000	0.0000
Sn-125	9.6400 d 0.31	5.4365E+20	1.2228E+04	0.3140	0.8110	0.0000	0.0000
In-115m	4.4860 h 0.09	1.0273E+19	1.1917E+04	0.1625	0.0174	0.0000	0.0000
Cd-115	2.2280 d 0.19	1.1218E+20	1.0917E+04	0.2020	0.4930	0.0000	0.0000
Rh-106	30.000 s 0.67	1.4742E+16	9206.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.5818E+22	9206.	0.0000	0.0100	0.0000	0.0000
Eu-156	15.190 d 0.53	4.1706E+20	5953.	1.3300	0.4250	0.0000	0.0000
Te-131	25.000 m 0.40	4.6926E+17	5861.	0.4220	0.7210	0.0000	0.0000
Xe-131m	11.930 d 0.13	3.0100E+20	5471.	0.0200	0.1430	0.0000	0.0000
Pm-147	2.6231 y 0.01	1.8649E+22	4221.	0.0000	0.0620	0.0000	0.0000
As-77	1.6180 d 0.13	3.0098E+19	4033.	0.0083	0.2254	0.0000	0.0000
Nb-95m	3.6090 d 0.92	6.4240E+19	3859.	0.0712	0.1710	0.0000	0.0000
Cs-136	13.030 d 0.54	2.0606E+20	3429.	2.1700	0.1350	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4069E+23	2780.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1452E+16	2625.	0.5990	0.0652	0.0000	0.0000
Sn-121	1.1280 d 0.15	1.3338E+19	2564.	0.0000	0.1150	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 507
Total activity (Ci) = 1.95530E+07

Total number of decays = 1.20440E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 74.239
Average chain length = 3.5476

Average gamma E (MeV) = 0.49846
Average beta E (MeV) = 0.27805
Average alpha E (MeV) = 3.57193E-17

Composite Exposure Rate Conversion Factor = 8.48499393 R/hr per Ci/m2
Composite ECF per FGR table = 9.07981777 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.23077488 Rem/hr per Ci/m2

Fission Product Source

Point in time = 9.52373600 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440 d 0.08	5.2777E+22	2.1822E+06	0.0463	0.1360	0.0000	0.0000
La-140	1.6780 d 0.01	1.1873E+22	1.5342E+06	2.3200	0.5340	0.0000	0.0000
Ba-140	12.770 d 0.12	8.1144E+22	1.3778E+06	0.1830	0.3100	0.0000	0.0000
Pr-143	13.560 d 0.07	8.5992E+22	1.3750E+06	0.0003	0.3151	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.2319E+22	9.7204E+05	0.1450	0.4080	0.0000	0.0000
I-132	2.2950 h 0.57	4.1789E+20	9.4755E+05	2.2900	0.4940	0.0000	0.0000
Tc-99m	6.0110 h 0.17	1.0879E+21	9.4181E+05	0.1240	0.0142	0.0000	0.0000
Te-132	3.2040 d 0.41	1.3584E+22	9.1927E+05	0.2340	0.1020	0.0000	0.0000
I-131	8.0230 d 0.02	3.3595E+22	9.0791E+05	0.3823	0.1920	0.0000	0.0000
Ce-141	32.500 d 0.03	1.1005E+23	7.3423E+05	0.0771	0.1710	0.0000	0.0000
Nd-147	10.980 d 0.09	2.6898E+22	5.3115E+05	0.1410	0.2690	0.0000	0.0000
Zr-95	64.030 d 0.01	1.3029E+23	4.4120E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	1.1503E+23	4.2626E+05	0.0046	0.6032	0.0000	0.0000
Ru-103	39.260 d 0.05	6.6567E+22	3.6764E+05	0.4850	0.1100	0.0000	0.0000
Sr-89	50.570 d 0.06	8.5583E+22	3.6695E+05	0.0010	0.5830	0.0000	0.0000
Rh-103m	56.120 m 0.00	6.5352E+19	3.6359E+05	0.0017	0.0375	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.0730E+21	1.6859E+05	0.2750	0.4390	0.0000	0.0000
Pm-149	2.2120 d 0.09	1.2894E+21	1.2639E+05	0.0119	0.3670	0.0000	0.0000
Pr-144	17.280 m 0.12	4.8473E+18	8.7585E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1512E+23	8.7582E+04	0.0192	0.0918	0.0000	0.0000
Sb-127	3.8500 d 1.30	1.4692E+21	8.2741E+04	0.6640	0.3140	0.0000	0.0000
Nb-95	34.990 d 0.02	1.2796E+22	7.9292E+04	0.7645	0.0434	0.0000	0.0000
Te-127	9.3500 h 0.64	1.4174E+20	7.8884E+04	0.0050	0.2245	0.0000	0.0000
Rh-105	1.4730 d 0.17	4.1741E+20	6.1443E+04	0.0773	0.1521	0.0000	0.0000
Xe-133m	2.1880 d 0.50	3.6239E+20	3.5912E+04	0.0414	0.1920	0.0000	0.0000
Te-129m	33.600 d 0.30	4.2501E+21	2.7426E+04	0.0373	0.2660	0.0000	0.0000
Ag-111	7.4500 d 0.13	7.2161E+20	2.1002E+04	0.0270	0.3550	0.0000	0.0000
I-133	20.800 h 0.48	7.7163E+19	1.9305E+04	0.6080	0.4100	0.0000	0.0000
Te-129	1.1600 h 0.29	3.8572E+18	1.7303E+04	0.0631	0.5420	0.0000	0.0000
Sm-153	1.9280 d 0.01	1.3786E+20	1.5504E+04	0.0617	0.2700	0.0000	0.0000
Sn-125	9.6400 d 0.31	4.7429E+20	1.0668E+04	0.3140	0.8110	0.0000	0.0000
Te-131m	1.2500 d 0.64	5.5381E+19	9606.	1.4200	0.0523	0.0000	0.0000
Rh-106	30.000 s 0.67	1.4690E+16	9173.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.5762E+22	9173.	0.0000	0.0100	0.0000	0.0000
Pm-151	1.1830 d 0.14	3.7845E+19	6936.	0.3270	0.3050	0.0000	0.0000
In-115m	4.4860 h 0.09	5.6921E+18	6603.	0.1625	0.0174	0.0000	0.0000
Cd-115	2.2280 d 0.19	6.2155E+19	6049.	0.2020	0.4930	0.0000	0.0000
Xe-131m	11.930 d 0.13	3.3118E+20	6019.	0.0200	0.1430	0.0000	0.0000
Eu-156	15.190 d 0.53	3.8246E+20	5459.	1.3300	0.4250	0.0000	0.0000
Pm-147	2.6231 y 0.01	2.2044E+22	4989.	0.0000	0.0620	0.0000	0.0000
Nb-95m	3.6090 d 0.92	6.9079E+19	4150.	0.0712	0.1710	0.0000	0.0000
Nb-97	1.2020 h 0.97	8.2389E+17	3567.	0.6670	0.4671	0.0000	0.0000
Zr-97	16.740 h 0.07	1.0641E+19	3308.	0.1800	0.7020	0.0000	0.0000
Nb-97m	52.700 s 3.42	8.8527E+15	3147.	0.7278	0.0156	0.0000	0.0000
Cs-136	13.030 d 0.54	1.8627E+20	3100.	2.1700	0.1350	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4067E+23	2780.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1449E+16	2624.	0.5990	0.0652	0.0000	0.0000
Sr-90	28.791 y 0.21	1.2117E+23	2498.	0.0001	0.1958	0.0000	0.0000
Y-90	2.6710 d 0.12	2.8253E+19	2294.	0.0020	0.9336	0.0000	0.0000
Te-127m	109.00 d 1.84	1.0530E+21	2095.	0.0111	0.0821	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 501
Total activity (Ci) = 1.54126E+07

Total number of decays = 1.21492E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 74.887
Average chain length = 3.5476

Average gamma E (MeV) = 0.50459
Average beta E (MeV) = 0.28202
Average alpha E (MeV) = 6.80405E-17

Composite Exposure Rate Conversion Factor = 8.60175133 R/hr per Ci/m2
Composite ECF per FGR table = 9.16502380 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.30731535 Rem/hr per Ci/m2

Fission Product Source

Point in time = 11.8942184 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Xe-133	5.2440 d 0.08	3.8794E+22	1.6040E+06	0.0463	0.1360	0.0000	0.0000
La-140	1.6780 d 0.01	1.0642E+22	1.3752E+06	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	7.6874E+22	1.2292E+06	0.0003	0.3151	0.0000	0.0000
Ba-140	12.770 d 0.12	7.1347E+22	1.2114E+06	0.1830	0.3100	0.0000	0.0000
I-131	8.0230 d 0.02	2.7409E+22	7.4075E+05	0.3823	0.1920	0.0000	0.0000
Ce-141	32.500 d 0.03	1.0463E+23	6.9804E+05	0.0771	0.1710	0.0000	0.0000
I-132	2.2950 h 0.57	2.5023E+20	5.6740E+05	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	8.1341E+21	5.5046E+05	0.2340	0.1020	0.0000	0.0000
Mo-99	2.7480 d 0.02	6.7751E+21	5.3457E+05	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	5.9830E+20	5.1795E+05	0.1240	0.0142	0.0000	0.0000
Nd-147	10.980 d 0.09	2.3159E+22	4.5733E+05	0.1410	0.2690	0.0000	0.0000
Zr-95	64.030 d 0.01	1.2699E+23	4.3002E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	1.1184E+23	4.1446E+05	0.0046	0.6032	0.0000	0.0000
Sr-89	50.570 d 0.06	8.2847E+22	3.5522E+05	0.0010	0.5830	0.0000	0.0000
Ru-103	39.260 d 0.05	6.3839E+22	3.5257E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	6.2674E+19	3.4869E+05	0.0017	0.0375	0.0000	0.0000
Nb-95	34.990 d 0.02	1.5428E+22	9.5603E+04	0.7645	0.0434	0.0000	0.0000
Pr-144	17.280 m 0.12	4.8195E+18	8.7082E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1446E+23	8.7079E+04	0.0192	0.0918	0.0000	0.0000
Pm-149	2.2120 d 0.09	6.1346E+20	6.0132E+04	0.0119	0.3670	0.0000	0.0000
Sb-127	3.8500 d 1.30	9.5879E+20	5.3998E+04	0.6640	0.3140	0.0000	0.0000
Te-127	9.3500 h 0.64	9.4016E+19	5.2325E+04	0.0050	0.2245	0.0000	0.0000
Ce-143	1.3800 d 0.15	3.2622E+20	5.1256E+04	0.2750	0.4390	0.0000	0.0000
Te-129m	33.600 d 0.30	4.0472E+21	2.6117E+04	0.0373	0.2660	0.0000	0.0000
Rh-105	1.4730 d 0.17	1.3681E+20	2.0139E+04	0.0773	0.1521	0.0000	0.0000
Xe-133m	2.1880 d 0.50	1.7219E+20	1.7064E+04	0.0414	0.1920	0.0000	0.0000
Ag-111	7.4500 d 0.13	5.7879E+20	1.6845E+04	0.0270	0.3550	0.0000	0.0000
Te-129	1.1600 h 0.29	3.6731E+18	1.6478E+04	0.0631	0.5420	0.0000	0.0000
Rh-106	30.000 s 0.67	1.4626E+16	9133.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.5693E+22	9133.	0.0000	0.0100	0.0000	0.0000
Sn-125	9.6400 d 0.31	3.9997E+20	8996.	0.3140	0.8110	0.0000	0.0000
Sm-153	1.9280 d 0.01	5.8792E+19	6612.	0.0617	0.2700	0.0000	0.0000
Xe-131m	11.930 d 0.13	3.5182E+20	6394.	0.0200	0.1430	0.0000	0.0000
Pm-147	2.6231 y 0.01	2.5742E+22	5826.	0.0000	0.0620	0.0000	0.0000
Eu-156	15.190 d 0.53	3.4325E+20	4900.	1.3300	0.4250	0.0000	0.0000
Nb-95m	3.6090 d 0.92	7.2425E+19	4351.	0.0712	0.1710	0.0000	0.0000
In-115m	4.4860 h 0.09	2.7227E+18	3158.	0.1625	0.0174	0.0000	0.0000
I-133	20.800 h 0.48	1.1589E+19	2899.	0.6080	0.4100	0.0000	0.0000
Cd-115	2.2280 d 0.19	2.9730E+19	2893.	0.2020	0.4930	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4065E+23	2780.	0.0015	0.2500	0.0000	0.0000
Cs-136	13.030 d 0.54	1.6420E+20	2732.	2.1700	0.1350	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1446E+16	2624.	0.5990	0.0652	0.0000	0.0000
Te-131m	1.2500 d 0.64	1.4876E+19	2580.	1.4200	0.0523	0.0000	0.0000
Sr-90	28.791 y 0.21	1.2115E+23	2498.	0.0001	0.1958	0.0000	0.0000
Y-90	2.6710 d 0.12	2.9412E+19	2388.	0.0020	0.9336	0.0000	0.0000
Te-127m	109.00 d 1.84	1.1206E+21	2229.	0.0111	0.0821	0.0000	0.0000
Pm-151	1.1830 d 0.14	9.4365E+18	1730.	0.3270	0.3050	0.0000	0.0000
Cd-115m	44.590 d 0.67	2.6615E+20	1294.	0.0339	0.6020	0.0000	0.0000
Pr-144m	6.9000 m 10.14	2.6557E+16	1202.	0.0121	0.0460	0.0000	0.0000
As-77	1.6180 d 0.13	4.8354E+18	648.0	0.0083	0.2254	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 487
Total activity (Ci) = 1.20630E+07

Total number of decays = 1.22524E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 75.523
Average chain length = 3.5476

Average gamma E (MeV) = 0.50650
Average beta E (MeV) = 0.28828
Average alpha E (MeV) = 1.29525E-16

Composite Exposure Rate Conversion Factor = 8.65835476 R/hr per Ci/m2
Composite ECF per FGR table = 9.17569065 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.33118773 Rem/hr per Ci/m2

Fission Product Source

Point in time = 14.8547211 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
La-140	1.6780	d	0.01	9.1467E+21	1.1819E+06	2.3200	0.5340	0.0000
Xe-133	5.2440	d	0.08	2.6323E+22	1.0884E+06	0.0463	0.1360	0.0000
Pr-143	13.560	d	0.07	6.6308E+22	1.0603E+06	0.0003	0.3151	0.0000
Ba-140	12.770	d	0.12	6.0756E+22	1.0316E+06	0.1830	0.3100	0.0000
Ce-141	32.500	d	0.03	9.8227E+22	6.5532E+05	0.0771	0.1710	0.0000
I-131	8.0230	d	0.02	2.1234E+22	5.7385E+05	0.3823	0.1920	0.0000
Zr-95	64.030	d	0.01	1.2298E+23	4.1646E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.0799E+23	4.0017E+05	0.0046	0.6032	0.0000
Nd-147	10.980	d	0.09	1.9211E+22	3.7937E+05	0.1410	0.2690	0.0000
Sr-89	50.570	d	0.06	7.9552E+22	3.4109E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	6.0588E+22	3.3461E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	5.9482E+19	3.3093E+05	0.0017	0.0375	0.0000
I-132	2.2950	h	0.57	1.3189E+20	2.9904E+05	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	4.2870E+21	2.9012E+05	0.2340	0.1020	0.0000
Mo-99	2.7480	d	0.02	3.2107E+21	2.5334E+05	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	2.8354E+20	2.4546E+05	0.1240	0.0142	0.0000
Nb-95	34.990	d	0.02	1.8435E+22	1.1424E+05	0.7645	0.0434	0.0000
Pr-144	17.280	m	0.12	4.7849E+18	8.6457E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1364E+23	8.6454E+04	0.0192	0.0918	0.0000
Te-127	9.3500	h	0.64	5.6946E+19	3.1694E+04	0.0050	0.2245	0.0000
Sb-127	3.8500	d	1.30	5.6266E+20	3.1688E+04	0.6640	0.3140	0.0000
Te-129m	33.600	d	0.30	3.8074E+21	2.4570E+04	0.0373	0.2660	0.0000
Pm-149	2.2120	d	0.09	2.4260E+20	2.3780E+04	0.0119	0.3670	0.0000
Te-129	1.1600	h	0.29	3.4555E+18	1.5501E+04	0.0631	0.5420	0.0000
Ag-111	7.4500	d	0.13	4.3943E+20	1.2789E+04	0.0270	0.3550	0.0000
Ce-143	1.3800	d	0.15	7.3742E+19	1.1586E+04	0.2750	0.4390	0.0000
Rh-106	30.000	s	0.67	1.4545E+16	9083.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5606E+22	9083.	0.0000	0.0100	0.0000
Sn-125	9.6400	d	0.31	3.2328E+20	7271.	0.3140	0.8110	0.0000
Pm-147	2.6231	y	0.01	2.9630E+22	6706.	0.0000	0.0620	0.0000
Xe-133m	2.1880	d	0.50	6.7568E+19	6696.	0.0414	0.1920	0.0000
Xe-131m	11.930	d	0.13	3.5796E+20	6506.	0.0200	0.1430	0.0000
Rh-105	1.4730	d	0.17	3.3970E+19	5000.	0.0773	0.1521	0.0000
Nb-95m	3.6090	d	0.92	7.3959E+19	4443.	0.0712	0.1710	0.0000
Eu-156	15.190	d	0.53	2.9987E+20	4280.	1.3300	0.4250	0.0000
Cs-137	30.041	y	0.10	1.4063E+23	2779.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1442E+16	2623.	0.5990	0.0652	0.0000
Sr-90	28.791	y	0.21	1.2113E+23	2498.	0.0001	0.1958	0.0000
Y-90	2.6710	d	0.12	3.0140E+19	2447.	0.0020	0.9336	0.0000
Cs-136	13.030	d	0.54	1.4028E+20	2334.	2.1700	0.1350	0.0000
Te-127m	109.00	d	1.84	1.1644E+21	2316.	0.0111	0.0821	0.0000
Sm-153	1.9280	d	0.01	2.0280E+19	2281.	0.0617	0.2700	0.0000
In-115m	4.4860	h	0.09	1.0840E+18	1257.	0.1625	0.0174	0.0000
Cd-115m	44.590	d	0.67	2.5418E+20	1236.	0.0339	0.6020	0.0000
Pr-144m	6.9000	m	10.14	2.6366E+16	1193.	0.0121	0.0460	0.0000
Cd-115	2.2280	d	0.19	1.1836E+19	1152.	0.2020	0.4930	0.0000
Sn-119m	293.10	d	0.44	7.1775E+20	531.0	0.0114	0.0783	0.0000
Sb-126	12.400	d	0.81	2.9405E+19	514.2	2.7500	0.3530	0.0000
Te-131m	1.2500	d	0.64	2.8809E+18	499.7	1.4200	0.0523	0.0000
Sb-125	2.7581	y	0.01	2.1718E+21	467.5	0.4367	0.0870	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 483
Total activity (Ci) = 9.40599E+06

Total number of decays = 1.23530E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 76.144
Average chain length = 3.5476

Average gamma E (MeV) = 0.50338
Average beta E (MeV) = 0.29563
Average alpha E (MeV) = 2.45174E-16

Composite Exposure Rate Conversion Factor = 8.63841057 R/hr per Ci/m2
Composite ECF per FGR table = 9.09943104 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.29219389 Rem/hr per Ci/m2

Fission Product Source

Point in time = 18.5520649 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
La-140	1.6780 d 0.01	7.5103E+21	9.7045E+05	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	5.4944E+22	8.7856E+05	0.0003	0.3151	0.0000	0.0000
Ba-140	12.770 d 0.12	4.9709E+22	8.4402E+05	0.1830	0.3100	0.0000	0.0000
Xe-133	5.2440 d 0.08	1.6183E+22	6.6913E+05	0.0463	0.1360	0.0000	0.0000
Ce-141	32.500 d 0.03	9.0779E+22	6.0563E+05	0.0771	0.1710	0.0000	0.0000
I-131	8.0230 d 0.02	1.5430E+22	4.1699E+05	0.3823	0.1920	0.0000	0.0000
Zr-95	64.030 d 0.01	1.1816E+23	4.0012E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	1.0336E+23	3.8302E+05	0.0046	0.6032	0.0000	0.0000
Sr-89	50.570 d 0.06	7.5621E+22	3.2424E+05	0.0010	0.5830	0.0000	0.0000
Ru-103	39.260 d 0.05	5.6759E+22	3.1347E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	5.5723E+19	3.1002E+05	0.0017	0.0375	0.0000	0.0000
Nd-147	10.980 d 0.09	1.5212E+22	3.0040E+05	0.1410	0.2690	0.0000	0.0000
Nb-95	34.990 d 0.02	2.1782E+22	1.3498E+05	0.7645	0.0434	0.0000	0.0000
I-132	2.2950 h 0.57	5.9267E+19	1.3439E+05	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	1.9265E+21	1.3037E+05	0.2340	0.1020	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.2635E+21	9.9695E+04	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	1.1158E+20	9.6595E+04	0.1240	0.0142	0.0000	0.0000
Pr-144	17.280 m 0.12	4.7421E+18	8.5683E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.1262E+23	8.5680E+04	0.0192	0.0918	0.0000	0.0000
Te-129m	33.600 d 0.30	3.5278E+21	2.2766E+04	0.0373	0.2660	0.0000	0.0000
Te-127	9.3500 h 0.64	3.1309E+19	1.7425E+04	0.0050	0.2245	0.0000	0.0000
Sb-127	3.8500 d 1.30	2.8917E+20	1.6285E+04	0.6640	0.3140	0.0000	0.0000
Te-129	1.1600 h 0.29	3.2017E+18	1.4363E+04	0.0631	0.5420	0.0000	0.0000
Ag-111	7.4500 d 0.13	3.1153E+20	9067.	0.0270	0.3550	0.0000	0.0000
Rh-106	30.000 s 0.67	1.4446E+16	9021.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.5499E+22	9021.	0.0000	0.0100	0.0000	0.0000
Pm-147	2.6231 y 0.01	3.3545E+22	7592.	0.0000	0.0620	0.0000	0.0000
Pm-149	2.2120 d 0.09	7.6159E+19	7465.	0.0119	0.3670	0.0000	0.0000
Xe-131m	11.930 d 0.13	3.4539E+20	6277.	0.0200	0.1430	0.0000	0.0000
Sn-125	9.6400 d 0.31	2.4781E+20	5574.	0.3140	0.8110	0.0000	0.0000
Nb-95m	3.6090 d 0.92	7.3580E+19	4421.	0.0712	0.1710	0.0000	0.0000
Eu-156	15.190 d 0.53	2.5332E+20	3616.	1.3300	0.4250	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4059E+23	2778.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1437E+16	2623.	0.5990	0.0652	0.0000	0.0000
Sr-90	28.791 y 0.21	1.2110E+23	2497.	0.0001	0.1958	0.0000	0.0000
Y-90	2.6710 d 0.12	3.0524E+19	2478.	0.0020	0.9336	0.0000	0.0000
Te-127m	109.00 d 1.84	1.1818E+21	2351.	0.0111	0.0821	0.0000	0.0000
Xe-133m	2.1880 d 0.50	2.0957E+19	2077.	0.0414	0.1920	0.0000	0.0000
Cs-136	13.030 d 0.54	1.1523E+20	1917.	2.1700	0.1350	0.0000	0.0000
Ce-143	1.3800 d 0.15	1.1513E+19	1809.	0.2750	0.4390	0.0000	0.0000
Pr-144m	6.9000 m 10.14	2.6130E+16	1182.	0.0121	0.0460	0.0000	0.0000
Cd-115m	44.590 d 0.67	2.3998E+20	1167.	0.0339	0.6020	0.0000	0.0000
Rh-105	1.4730 d 0.17	5.9633E+18	877.8	0.0773	0.1521	0.0000	0.0000
Sm-153	1.9280 d 0.01	5.3677E+18	603.7	0.0617	0.2700	0.0000	0.0000
Sn-119m	293.10 d 0.44	7.1150E+20	526.3	0.0114	0.0783	0.0000	0.0000
Sb-125	2.7581 y 0.01	2.2416E+21	482.5	0.4367	0.0870	0.0000	0.0000
Sb-126	12.400 d 0.81	2.3915E+19	418.2	2.7500	0.3530	0.0000	0.0000
In-115m	4.4860 h 0.09	3.4321E+17	398.1	0.1625	0.0174	0.0000	0.0000
Kr-85	10.750 y 0.21	7.0048E+21	386.8	0.0022	0.2507	0.0000	0.0000
Cd-115	2.2280 d 0.19	3.7466E+18	364.6	0.2020	0.4930	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 473
Total activity (Ci) = 7.34214E+06

Total number of decays = 1.24510E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 76.748
Average chain length = 3.5476

Average gamma E (MeV) = 0.49520
Average beta E (MeV) = 0.30269
Average alpha E (MeV) = 4.58437E-16

Composite Exposure Rate Conversion Factor = 8.54090500 R/hr per Ci/m2
Composite ECF per FGR table = 8.93920422 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.19000959 Rem/hr per Ci/m2

Fission Product Source

Point in time = 23.1697197 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
La-140	1.6780	d	0.01	5.8513E+21	7.5609E+05	2.3200	0.5340	0.0000
Pr-143	13.560	d	0.07	4.3401E+22	6.9398E+05	0.0003	0.3151	0.0000
Ba-140	12.770	d	0.12	3.8688E+22	6.5690E+05	0.1830	0.3100	0.0000
Ce-141	32.500	d	0.03	8.2265E+22	5.4883E+05	0.0771	0.1710	0.0000
Zr-95	64.030	d	0.01	1.1240E+23	3.8061E+05	0.7328	0.1200	0.0000
Xe-133	5.2440	d	0.08	8.8012E+21	3.6391E+05	0.0463	0.1360	0.0000
Y-91	58.510	d	0.10	9.7856E+22	3.6263E+05	0.0046	0.6032	0.0000
Sr-89	50.570	d	0.06	7.0983E+22	3.0435E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	5.2315E+22	2.8893E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	5.1361E+19	2.8575E+05	0.0017	0.0375	0.0000
I-131	8.0230	d	0.02	1.0354E+22	2.7982E+05	0.3823	0.1920	0.0000
Nd-147	10.980	d	0.09	1.1366E+22	2.2444E+05	0.1410	0.2690	0.0000
Nb-95	34.990	d	0.02	2.5380E+22	1.5727E+05	0.7645	0.0434	0.0000
Pr-144	17.280	m	0.12	4.6891E+18	8.4726E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.1136E+23	8.4723E+04	0.0192	0.0918	0.0000
I-132	2.2950	h	0.57	2.1826E+19	4.9488E+04	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	7.0946E+20	4.8011E+04	0.2340	0.1020	0.0000
Mo-99	2.7480	d	0.02	3.9422E+20	3.1105E+04	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	3.4813E+19	3.0138E+04	0.1240	0.0142	0.0000
Te-129m	33.600	d	0.30	3.2073E+21	2.0697E+04	0.0373	0.2660	0.0000
Te-129	1.1600	h	0.29	2.9108E+18	1.3058E+04	0.0631	0.5420	0.0000
Rh-106	30.000	s	0.67	1.4322E+16	8943.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5367E+22	8943.	0.0000	0.0100	0.0000
Te-127	9.3500	h	0.64	1.5942E+19	8873.	0.0050	0.2245	0.0000
Pm-147	2.6231	y	0.01	3.7273E+22	8436.	0.0000	0.0620	0.0000
Sb-127	3.8500	d	1.30	1.2592E+20	7092.	0.6640	0.3140	0.0000
Ag-111	7.4500	d	0.13	2.0273E+20	5900.	0.0270	0.3550	0.0000
Xe-131m	11.930	d	0.13	3.1221E+20	5674.	0.0200	0.1430	0.0000
Nb-95m	3.6090	d	0.92	7.1418E+19	4291.	0.0712	0.1710	0.0000
Sn-125	9.6400	d	0.31	1.7780E+20	3999.	0.3140	0.8110	0.0000
Eu-156	15.190	d	0.53	2.0519E+20	2929.	1.3300	0.4250	0.0000
Cs-137	30.041	y	0.10	1.4055E+23	2778.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1431E+16	2622.	0.5990	0.0652	0.0000
Sr-90	28.791	y	0.21	1.2106E+23	2496.	0.0001	0.1958	0.0000
Y-90	2.6710	d	0.12	3.0685E+19	2491.	0.0020	0.9336	0.0000
Te-127m	109.00	d	1.84	1.1741E+21	2335.	0.0111	0.0821	0.0000
Pm-149	2.2120	d	0.09	1.7919E+19	1756.	0.0119	0.3670	0.0000
Cs-136	13.030	d	0.54	9.0133E+19	1500.	2.1700	0.1350	0.0000
Pr-144m	6.9000	m	10.14	2.5838E+16	1169.	0.0121	0.0460	0.0000
Cd-115m	44.590	d	0.67	2.2336E+20	1086.	0.0339	0.6020	0.0000
Sn-119m	293.10	d	0.44	7.0377E+20	520.6	0.0114	0.0783	0.0000
Sb-125	2.7581	y	0.01	2.3044E+21	496.0	0.4367	0.0870	0.0000
Xe-133m	2.1880	d	0.50	4.8537E+18	481.0	0.0414	0.1920	0.0000
Kr-85	10.750	y	0.21	6.9991E+21	386.5	0.0022	0.2507	0.0000
Sb-126	12.400	d	0.81	1.8474E+19	323.0	2.7500	0.3530	0.0000
Sn-123	129.20	d	0.31	1.7341E+20	291.0	0.0077	0.5232	0.0000
Ce-143	1.3800	d	0.15	1.1321E+18	177.9	0.2750	0.4390	0.0000
Eu-155	4.7531	y	0.29	1.0865E+21	135.7	0.0613	0.0650	0.0000
Sm-153	1.9280	d	0.01	1.0205E+18	114.8	0.0617	0.2700	0.0000
Rh-105	1.4730	d	0.17	6.7889E+17	99.93	0.0773	0.1521	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 469
Total activity (Ci) = 5.75223E+06

Total number of decays = 1.25467E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 77.338
Average chain length = 3.5476

Average gamma E (MeV) = 0.48180
Average beta E (MeV) = 0.30802
Average alpha E (MeV) = 8.43116E-16

Composite Exposure Rate Conversion Factor = 8.36413765 R/hr per Ci/m2
Composite ECF per FGR table = 8.69512653 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 6.02248526 Rem/hr per Ci/m2

Fission Product Source

Point in time = 28.9367237 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
La-140	1.6780	d	0.01	4.2796E+21	5.5299E+05	2.3200	0.5340	0.0000
Pr-143	13.560	d	0.07	3.2321E+22	5.1681E+05	0.0003	0.3151	0.0000
Ce-141	32.500	d	0.03	7.2744E+22	4.8531E+05	0.0771	0.1710	0.0000
Ba-140	12.770	d	0.12	2.8290E+22	4.8034E+05	0.1830	0.3100	0.0000
Zr-95	64.030	d	0.01	1.0559E+23	3.5758E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	9.1394E+22	3.3868E+05	0.0046	0.6032	0.0000
Sr-89	50.570	d	0.06	6.5588E+22	2.8122E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	4.7251E+22	2.6096E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	4.6389E+19	2.5809E+05	0.0017	0.0375	0.0000
Nb-95	34.990	d	0.02	2.9064E+22	1.8010E+05	0.7645	0.0434	0.0000
I-131	8.0230	d	0.02	6.2911E+21	1.7002E+05	0.3823	0.1920	0.0000
Xe-133	5.2440	d	0.08	4.1092E+21	1.6990E+05	0.0463	0.1360	0.0000
Nd-147	10.980	d	0.09	7.8974E+21	1.5595E+05	0.1410	0.2690	0.0000
Pr-144	17.280	m	0.12	4.6238E+18	8.3546E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.0981E+23	8.3543E+04	0.0192	0.0918	0.0000
Te-129m	33.600	d	0.30	2.8475E+21	1.8376E+04	0.0373	0.2660	0.0000
I-132	2.2950	h	0.57	6.2680E+18	1.4212E+04	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	2.0375E+20	1.3788E+04	0.2340	0.1020	0.0000
Te-129	1.1600	h	0.29	2.5843E+18	1.1593E+04	0.0631	0.5420	0.0000
Pm-147	2.6231	y	0.01	4.0578E+22	9184.	0.0000	0.0620	0.0000
Rh-106	30.000	s	0.67	1.4169E+16	8848.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.5203E+22	8848.	0.0000	0.0100	0.0000
Mo-99	2.7480	d	0.02	9.2043E+19	7262.	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	8.1282E+18	7037.	0.1240	0.0142	0.0000
Xe-131m	11.930	d	0.13	2.6043E+20	4733.	0.0200	0.1430	0.0000
Te-127	9.3500	h	0.64	8.1975E+18	4562.	0.0050	0.2245	0.0000
Nb-95m	3.6090	d	0.92	6.7759E+19	4071.	0.0712	0.1710	0.0000
Ag-111	7.4500	d	0.13	1.1855E+20	3450.	0.0270	0.3550	0.0000
Cs-137	30.041	y	0.10	1.4050E+23	2777.	0.0015	0.2500	0.0000
Sn-125	9.6400	d	0.31	1.1745E+20	2642.	0.3140	0.8110	0.0000
Ba-137m	2.5520	m	0.04	2.1423E+16	2621.	0.5990	0.0652	0.0000
Sb-127	3.8500	d	1.30	4.4584E+19	2511.	0.6640	0.3140	0.0000
Sr-90	28.791	y	0.21	1.2102E+23	2495.	0.0001	0.1958	0.0000
Y-90	2.6710	d	0.12	3.0730E+19	2495.	0.0020	0.9336	0.0000
Te-127m	109.00	d	1.84	1.1449E+21	2277.	0.0111	0.0821	0.0000
Eu-156	15.190	d	0.53	1.5771E+20	2251.	1.3300	0.4250	0.0000
Pr-144m	6.9000	m	10.14	2.5479E+16	1153.	0.0121	0.0460	0.0000
Cs-136	13.030	d	0.54	6.6321E+19	1104.	2.1700	0.1350	0.0000
Cd-115m	44.590	d	0.67	2.0420E+20	993.0	0.0339	0.6020	0.0000
Sn-119m	293.10	d	0.44	6.9424E+20	513.6	0.0114	0.0783	0.0000
Sb-125	2.7581	y	0.01	2.3555E+21	507.0	0.4367	0.0870	0.0000
Kr-85	10.750	y	0.21	6.9920E+21	386.1	0.0022	0.2507	0.0000
Pm-149	2.2120	d	0.09	2.9409E+18	288.3	0.0119	0.3670	0.0000
Sn-123	129.20	d	0.31	1.6813E+20	282.2	0.0077	0.5232	0.0000
Sb-126	12.400	d	0.81	1.3383E+19	234.0	2.7500	0.3530	0.0000
Eu-155	4.7531	y	0.29	1.0840E+21	135.4	0.0613	0.0650	0.0000
Xe-133m	2.1880	d	0.50	7.8098E+17	77.39	0.0414	0.1920	0.0000
Sm-151	89.992	y	6.66	9.9532E+21	65.66	0.0000	0.1250	0.0000
Te-125m	57.400	d	0.26	8.0808E+18	30.52	0.0360	0.1110	0.0000
Y-89m	15.660	s	0.03	2.3508E+13	28.12	0.9014	0.0077	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 460
Total activity (Ci) = 4.51703E+06

Total number of decays = 1.26405E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 77.916
Average chain length = 3.5476

Average gamma E (MeV) = 0.46227
Average beta E (MeV) = 0.31048
Average alpha E (MeV) = 1.52470E-15

Composite Exposure Rate Conversion Factor = 8.09596825 R/hr per Ci/m2
Composite ECF per FGR table = 8.35240078 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.77834892 Rem/hr per Ci/m2

Fission Product Source

Point in time = 36.1390800 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ce-141	32.500 d 0.03	6.2386E+22	4.1621E+05	0.0771	0.1710	0.0000	0.0000
La-140	1.6780 d 0.01	2.8949E+21	3.7407E+05	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	2.2366E+22	3.5764E+05	0.0003	0.3151	0.0000	0.0000
Zr-95	64.030 d 0.01	9.7674E+22	3.3076E+05	0.7328	0.1200	0.0000	0.0000
Ba-140	12.770 d 0.12	1.9136E+22	3.2491E+05	0.1830	0.3100	0.0000	0.0000
Y-91	58.510 d 0.10	8.3919E+22	3.1099E+05	0.0046	0.6032	0.0000	0.0000
Sr-89	50.570 d 0.06	5.9423E+22	2.5478E+05	0.0010	0.5830	0.0000	0.0000
Ru-103	39.260 d 0.05	4.1609E+22	2.2980E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	4.0849E+19	2.2727E+05	0.0017	0.0375	0.0000	0.0000
Nb-95	34.990 d 0.02	3.2573E+22	2.0185E+05	0.7645	0.0434	0.0000	0.0000
Nd-147	10.980 d 0.09	5.0121E+21	9.8976E+04	0.1410	0.2690	0.0000	0.0000
I-131	8.0230 d 0.02	3.3767E+21	9.1256E+04	0.3823	0.1920	0.0000	0.0000
Pr-144	17.280 m 0.12	4.5435E+18	8.2095E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.0790E+23	8.2093E+04	0.0192	0.0918	0.0000	0.0000
Xe-133	5.2440 d 0.08	1.5864E+21	6.5593E+04	0.0463	0.1360	0.0000	0.0000
Te-129m	33.600 d 0.30	2.4544E+21	1.5838E+04	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600 h 0.29	2.2275E+18	9993.	0.0631	0.5420	0.0000	0.0000
Pm-147	2.6231 y 0.01	4.3244E+22	9787.	0.0000	0.0620	0.0000	0.0000
Rh-106	30.000 s 0.67	1.3980E+16	8730.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.5000E+22	8730.	0.0000	0.0100	0.0000	0.0000
Nb-95m	3.6090 d 0.92	6.2919E+19	3780.	0.0712	0.1710	0.0000	0.0000
Xe-131m	11.930 d 0.13	1.9678E+20	3576.	0.0200	0.1430	0.0000	0.0000
I-132	2.2950 h 0.57	1.3196E+18	2992.	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	4.2894E+19	2903.	0.2340	0.1020	0.0000	0.0000
Te-127	9.3500 h 0.64	4.9924E+18	2779.	0.0050	0.2245	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4044E+23	2775.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1413E+16	2620.	0.5990	0.0652	0.0000	0.0000
Y-90	2.6710 d 0.12	3.0729E+19	2495.	0.0020	0.9336	0.0000	0.0000
Sr-90	28.791 y 0.21	1.2096E+23	2494.	0.0001	0.1958	0.0000	0.0000
Te-127m	109.00 d 1.84	1.0988E+21	2186.	0.0111	0.0821	0.0000	0.0000
Ag-111	7.4500 d 0.13	6.0654E+19	1765.	0.0270	0.3550	0.0000	0.0000
Eu-156	15.190 d 0.53	1.1354E+20	1621.	1.3300	0.4250	0.0000	0.0000
Sn-125	9.6400 d 0.31	6.9972E+19	1574.	0.3140	0.8110	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.4963E+19	1181.	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	1.3213E+18	1144.	0.1240	0.0142	0.0000	0.0000
Pr-144m	6.9000 m 10.14	2.5036E+16	1133.	0.0121	0.0460	0.0000	0.0000
Cd-115m	44.590 d 0.67	1.8258E+20	887.8	0.0339	0.6020	0.0000	0.0000
Cs-136	13.030 d 0.54	4.5212E+19	752.4	2.1700	0.1350	0.0000	0.0000
Sb-127	3.8500 d 1.30	1.2191E+19	686.6	0.6640	0.3140	0.0000	0.0000
Sb-125	2.7581 y 0.01	2.3912E+21	514.7	0.4367	0.0870	0.0000	0.0000
Sn-119m	293.10 d 0.44	6.8252E+20	504.9	0.0114	0.0783	0.0000	0.0000
Kr-85	10.750 y 0.21	6.9831E+21	385.6	0.0022	0.2507	0.0000	0.0000
Sn-123	129.20 d 0.31	1.6176E+20	271.5	0.0077	0.5232	0.0000	0.0000
Sb-126	12.400 d 0.81	8.9478E+18	156.5	2.7500	0.3530	0.0000	0.0000
Eu-155	4.7531 y 0.29	1.0809E+21	135.0	0.0613	0.0650	0.0000	0.0000
Sm-151	89.992 y 6.66	9.9517E+21	65.65	0.0000	0.1250	0.0000	0.0000
Te-125m	57.400 d 0.26	9.9312E+18	37.51	0.0360	0.1110	0.0000	0.0000
Pm-149	2.2120 d 0.09	3.0783E+17	30.17	0.0119	0.3670	0.0000	0.0000
Y-89m	15.660 s 0.03	2.1298E+13	25.48	0.9014	0.0077	0.0000	0.0000
Sb-124	60.200 d 0.05	6.5381E+18	23.55	1.8500	0.3900	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 449
Total activity (Ci) = 3.54291E+06

Total number of decays = 1.27324E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 78.482
Average chain length = 3.5476

Average gamma E (MeV) = 0.43586
Average beta E (MeV) = 0.30967
Average alpha E (MeV) = 2.71708E-15

Composite Exposure Rate Conversion Factor = 7.72762966 R/hr per Ci/m2
Composite ECF per FGR table = 7.89682722 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.44820356 Rem/hr per Ci/m2

Fission Product Source

Point in time = 45.1341934 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Ce-141	32.500 d 0.03	5.1495E+22	3.4355E+05	0.0771	0.1710	0.0000	0.0000
Zr-95	64.030 d 0.01	8.8612E+22	3.0007E+05	0.7328	0.1200	0.0000	0.0000
Y-91	58.510 d 0.10	7.5436E+22	2.7955E+05	0.0046	0.6032	0.0000	0.0000
La-140	1.6780 d 0.01	1.7766E+21	2.2956E+05	2.3200	0.5340	0.0000	0.0000
Pr-143	13.560 d 0.07	1.4122E+22	2.2582E+05	0.0003	0.3151	0.0000	0.0000
Sr-89	50.570 d 0.06	5.2530E+22	2.2523E+05	0.0010	0.5830	0.0000	0.0000
Nb-95	34.990 d 0.02	3.5546E+22	2.2027E+05	0.7645	0.0434	0.0000	0.0000
Ba-140	12.770 d 0.12	1.1744E+22	1.9940E+05	0.1830	0.3100	0.0000	0.0000
Ru-103	39.260 d 0.05	3.5499E+22	1.9605E+05	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120 m 0.00	3.4851E+19	1.9390E+05	0.0017	0.0375	0.0000	0.0000
Pr-144	17.280 m 0.12	4.4452E+18	8.0319E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00 d 0.07	1.0557E+23	8.0316E+04	0.0192	0.0918	0.0000	0.0000
Nd-147	10.980 d 0.09	2.8406E+21	5.6094E+04	0.1410	0.2690	0.0000	0.0000
I-131	8.0230 d 0.02	1.5523E+21	4.1953E+04	0.3823	0.1920	0.0000	0.0000
Xe-133	5.2440 d 0.08	4.8315E+20	1.9977E+04	0.0463	0.1360	0.0000	0.0000
Te-129m	33.600 d 0.30	2.0387E+21	1.3156E+04	0.0373	0.2660	0.0000	0.0000
Pm-147	2.6231 y 0.01	4.5128E+22	1.0213E+04	0.0000	0.0620	0.0000	0.0000
Rh-106	30.000 s 0.67	1.3748E+16	8585.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200 y 0.27	1.4752E+22	8585.	0.0000	0.0100	0.0000	0.0000
Te-129	1.1600 h 0.29	1.8502E+18	8300.	0.0631	0.5420	0.0000	0.0000
Nb-95m	3.6090 d 0.92	5.7147E+19	3433.	0.0712	0.1710	0.0000	0.0000
Cs-137	30.041 y 0.10	1.4036E+23	2774.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520 m 0.04	2.1401E+16	2618.	0.5990	0.0652	0.0000	0.0000
Y-90	2.6710 d 0.12	3.0714E+19	2493.	0.0020	0.9336	0.0000	0.0000
Sr-90	28.791 y 0.21	1.2089E+23	2493.	0.0001	0.1958	0.0000	0.0000
Xe-131m	11.930 d 0.13	1.3166E+20	2393.	0.0200	0.1430	0.0000	0.0000
Te-127	9.3500 h 0.64	3.8653E+18	2151.	0.0050	0.2245	0.0000	0.0000
Te-127m	109.00 d 1.84	1.0393E+21	2067.	0.0111	0.0821	0.0000	0.0000
Pr-144m	6.9000 m 10.14	2.4494E+16	1108.	0.0121	0.0460	0.0000	0.0000
Eu-156	15.190 d 0.53	7.5313E+19	1075.	1.3300	0.4250	0.0000	0.0000
Sn-125	9.6400 d 0.31	3.6647E+19	824.3	0.3140	0.8110	0.0000	0.0000
Cd-115m	44.590 d 0.67	1.5875E+20	771.9	0.0339	0.6020	0.0000	0.0000
Ag-111	7.4500 d 0.13	2.6266E+19	764.5	0.0270	0.3550	0.0000	0.0000
Sb-125	2.7581 y 0.01	2.4097E+21	518.7	0.4367	0.0870	0.0000	0.0000
Sn-119m	293.10 d 0.44	6.6815E+20	494.3	0.0114	0.0783	0.0000	0.0000
Cs-136	13.030 d 0.54	2.8018E+19	466.2	2.1700	0.1350	0.0000	0.0000
I-132	2.2950 h 0.57	1.8850E+17	427.4	2.2900	0.4940	0.0000	0.0000
Te-132	3.2040 d 0.41	6.1273E+18	414.7	0.2340	0.1020	0.0000	0.0000
Kr-85	10.750 y 0.21	6.9720E+21	385.0	0.0022	0.2507	0.0000	0.0000
Sn-123	129.20 d 0.31	1.5414E+20	258.7	0.0077	0.5232	0.0000	0.0000
Sb-127	3.8500 d 1.30	2.4138E+18	135.9	0.6640	0.3140	0.0000	0.0000
Eu-155	4.7531 y 0.29	1.0770E+21	134.5	0.0613	0.0650	0.0000	0.0000
Mo-99	2.7480 d 0.02	1.5475E+18	122.1	0.1450	0.4080	0.0000	0.0000
Tc-99m	6.0110 h 0.17	1.3666E+17	118.3	0.1240	0.0142	0.0000	0.0000
Sb-126	12.400 d 0.81	5.4118E+18	94.63	2.7500	0.3530	0.0000	0.0000
Sm-151	89.992 y 6.66	9.9498E+21	65.64	0.0000	0.1250	0.0000	0.0000
Te-125m	57.400 d 0.26	1.2062E+19	45.56	0.0360	0.1110	0.0000	0.0000
Y-89m	15.660 s 0.03	1.8828E+13	22.52	0.9014	0.0077	0.0000	0.0000
Sb-124	60.200 d 0.05	5.8948E+18	21.23	1.8500	0.3900	0.0000	0.0000
H-3	12.330 y 0.16	3.1967E+20	15.39	0.0000	0.0057	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 440
Total activity (Ci) = 2.76963E+06

Total number of decays = 1.28223E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 79.037
Average chain length = 3.5476

Average gamma E (MeV) = 0.40405
Average beta E (MeV) = 0.30613
Average alpha E (MeV) = 4.77753E-15

Composite Exposure Rate Conversion Factor = 7.28632927 R/hr per Ci/m2
Composite ECF per FGR table = 7.35297108 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 5.05060816 Rem/hr per Ci/m2

Fission Product Source

Point in time = 56.3682137 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Ce-141	32.500	d	0.03	4.0524E+22	2.7036E+05	0.0771	0.1710	0.0000
Zr-95	64.030	d	0.01	7.8465E+22	2.6571E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	6.6036E+22	2.4472E+05	0.0046	0.6032	0.0000
Nb-95	34.990	d	0.02	3.7530E+22	2.3257E+05	0.7645	0.0434	0.0000
Sr-89	50.570	d	0.06	4.5033E+22	1.9309E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	2.9112E+22	1.6078E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	2.8581E+19	1.5901E+05	0.0017	0.0375	0.0000
Pr-143	13.560	d	0.07	7.9526E+21	1.2716E+05	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	9.6553E+20	1.2476E+05	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	6.3824E+21	1.0837E+05	0.1830	0.3100	0.0000
Pr-144	17.280	m	0.12	4.3254E+18	7.8154E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	1.0272E+23	7.8152E+04	0.0192	0.0918	0.0000
Nd-147	10.980	d	0.09	1.3977E+21	2.7601E+04	0.1410	0.2690	0.0000
I-131	8.0230	d	0.02	5.8813E+20	1.5895E+04	0.3823	0.1920	0.0000
Pm-147	2.6231	y	0.01	4.6199E+22	1.0456E+04	0.0000	0.0620	0.0000
Te-129m	33.600	d	0.30	1.6170E+21	1.0435E+04	0.0373	0.2660	0.0000
Rh-106	30.000	s	0.67	1.3464E+16	8408.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.4446E+22	8408.	0.0000	0.0100	0.0000
Te-129	1.1600	h	0.29	1.4675E+18	6583.	0.0631	0.5420	0.0000
Xe-133	5.2440	d	0.08	1.0945E+20	4525.	0.0463	0.1360	0.0000
Nb-95m	3.6090	d	0.92	5.0615E+19	3041.	0.0712	0.1710	0.0000
Cs-137	30.041	y	0.10	1.4026E+23	2772.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1386E+16	2616.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0691E+19	2491.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.2080E+23	2491.	0.0001	0.1958	0.0000
Te-127m	109.00	d	1.84	9.6797E+20	1926.	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	3.4188E+18	1903.	0.0050	0.2245	0.0000
Xe-131m	11.930	d	0.13	7.5870E+19	1379.	0.0200	0.1430	0.0000
Pr-144m	6.9000	m	10.14	2.3834E+16	1079.	0.0121	0.0460	0.0000
Cd-115m	44.590	d	0.67	1.3331E+20	648.3	0.0339	0.6020	0.0000
Eu-156	15.190	d	0.53	4.5106E+19	643.9	1.3300	0.4250	0.0000
Sb-125	2.7581	y	0.01	2.4113E+21	519.0	0.4367	0.0870	0.0000
Sn-119m	293.10	d	0.44	6.5063E+20	481.3	0.0114	0.0783	0.0000
Kr-85	10.750	y	0.21	6.9582E+21	384.2	0.0022	0.2507	0.0000
Sn-125	9.6400	d	0.31	1.6339E+19	367.5	0.3140	0.8110	0.0000
Ag-111	7.4500	d	0.13	9.2357E+18	268.8	0.0270	0.3550	0.0000
Cs-136	13.030	d	0.54	1.5414E+19	256.5	2.1700	0.1350	0.0000
Sn-123	129.20	d	0.31	1.4512E+20	243.5	0.0077	0.5232	0.0000
Eu-155	4.7531	y	0.29	1.0722E+21	133.9	0.0613	0.0650	0.0000
Sm-151	89.992	y	6.66	9.9475E+21	65.62	0.0000	0.1250	0.0000
Te-125m	57.400	d	0.26	1.4434E+19	54.52	0.0360	0.1110	0.0000
Sb-126	12.400	d	0.81	2.8882E+18	50.50	2.7500	0.3530	0.0000
I-132	2.2950	h	0.57	1.6589E+16	37.61	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	5.3924E+17	36.49	0.2340	0.1020	0.0000
Y-89m	15.660	s	0.03	1.6141E+13	19.31	0.9014	0.0077	0.0000
Sb-124	60.200	d	0.05	5.1796E+18	18.66	1.8500	0.3900	0.0000
Sb-127	3.8500	d	1.30	3.1939E+17	17.99	0.6640	0.3140	0.0000
H-3	12.330	y	0.16	3.1912E+20	15.36	0.0000	0.0057	0.0000
Mo-99	2.7480	d	0.02	9.0993E+16	7.180	0.1450	0.4080	0.0000
Tc-99m	6.0110	h	0.17	8.0354E+15	6.956	0.1240	0.0142	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 426
Total activity (Ci) = 2.15912E+06

Total number of decays = 1.29100E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 79.577
Average chain length = 3.5476

Average gamma E (MeV) = 0.37188
Average beta E (MeV) = 0.30133
Average alpha E (MeV) = 8.28267E-15

Composite Exposure Rate Conversion Factor = 6.85488605 R/hr per Ci/m2
Composite ECF per FGR table = 6.80823517 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.64854050 Rem/hr per Ci/m2

Fission Product Source

Point in time = 70.3984070 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	3.8043E+22	2.3574E+05	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	6.7408E+22	2.2827E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	5.5924E+22	2.0724E+05	0.0046	0.6032	0.0000
Ce-141	32.500	d	0.03	3.0044E+22	2.0044E+05	0.0771	0.1710	0.0000
Sr-89	50.570	d	0.06	3.7155E+22	1.5931E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	2.2725E+22	1.2550E+05	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	2.2310E+19	1.2412E+05	0.0017	0.0375	0.0000
Pr-144	17.280	m	0.12	4.1803E+18	7.5532E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	9.9278E+22	7.5530E+04	0.0192	0.0918	0.0000
Pr-143	13.560	d	0.07	3.8819E+21	6.2071E+04	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	4.5085E+20	5.8257E+04	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	2.9802E+21	5.0602E+04	0.1830	0.3100	0.0000
Nd-147	10.980	d	0.09	5.7645E+20	1.1383E+04	0.1410	0.2690	0.0000
Pm-147	2.6231	y	0.01	4.6548E+22	1.0535E+04	0.0000	0.0620	0.0000
Rh-106	30.000	s	0.67	1.3117E+16	8191.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.4074E+22	8191.	0.0000	0.0100	0.0000
Te-129m	33.600	d	0.30	1.2106E+21	7812.	0.0373	0.2660	0.0000
Te-129	1.1600	h	0.29	1.0987E+18	4929.	0.0631	0.5420	0.0000
I-131	8.0230	d	0.02	1.7500E+20	4730.	0.3823	0.1920	0.0000
Cs-137	30.041	y	0.10	1.4013E+23	2769.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1367E+16	2614.	0.5990	0.0652	0.0000
Nb-95m	3.6090	d	0.92	4.3485E+19	2613.	0.0712	0.1710	0.0000
Y-90	2.6710	d	0.12	3.0663E+19	2489.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.2069E+23	2488.	0.0001	0.1958	0.0000
Te-127m	109.00	d	1.84	8.8540E+20	1761.	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	3.1021E+18	1726.	0.0050	0.2245	0.0000
Pr-144m	6.9000	m	10.14	2.3035E+16	1042.	0.0121	0.0460	0.0000
Xe-133	5.2440	d	0.08	1.7132E+19	708.4	0.0463	0.1360	0.0000
Xe-131m	11.930	d	0.13	3.6416E+19	661.9	0.0200	0.1430	0.0000
Cd-115m	44.590	d	0.67	1.0719E+20	521.2	0.0339	0.6020	0.0000
Sb-125	2.7581	y	0.01	2.3985E+21	516.3	0.4367	0.0870	0.0000
Sn-119m	293.10	d	0.44	6.2940E+20	465.6	0.0114	0.0783	0.0000
Kr-85	10.750	y	0.21	6.9410E+21	383.3	0.0022	0.2507	0.0000
Eu-156	15.190	d	0.53	2.3779E+19	339.4	1.3300	0.4250	0.0000
Sn-123	129.20	d	0.31	1.3460E+20	225.9	0.0077	0.5232	0.0000
Sn-125	9.6400	d	0.31	5.9581E+18	134.0	0.3140	0.8110	0.0000
Eu-155	4.7531	y	0.29	1.0662E+21	133.2	0.0613	0.0650	0.0000
Cs-136	13.030	d	0.54	7.3075E+18	121.6	2.1700	0.1350	0.0000
Ag-111	7.4500	d	0.13	2.5035E+18	72.86	0.0270	0.3550	0.0000
Sm-151	89.992	y	6.66	9.9445E+21	65.60	0.0000	0.1250	0.0000
Te-125m	57.400	d	0.26	1.6965E+19	64.09	0.0360	0.1110	0.0000
Sb-126	12.400	d	0.81	1.3184E+18	23.05	2.7500	0.3530	0.0000
Y-89m	15.660	s	0.03	1.3317E+13	15.93	0.9014	0.0077	0.0000
Sb-124	60.200	d	0.05	4.4070E+18	15.87	1.8500	0.3900	0.0000
H-3	12.330	y	0.16	3.1843E+20	15.33	0.0000	0.0057	0.0000
I-132	2.2950	h	0.57	7.9730E+14	1.808	2.2900	0.4940	0.0000
Te-132	3.2040	d	0.41	2.5917E+16	1.754	0.2340	0.1020	0.0000
Cs-134	2.0650	y	0.03	6.0933E+18	1.752	1.5500	0.1640	0.0000
Sn-117m	13.600	d	0.29	9.1970E+16	1.466	0.1580	0.1610	0.0000
Sb-127	3.8500	d	1.30	2.5545E+16	1.439	0.6640	0.3140	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867381D+24

Total number of nuclides = 416
Total activity (Ci) = 1.68039E+06

Total number of decays = 1.29953E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 80.103
Average chain length = 3.5476

Average gamma E (MeV) = 0.34644
Average beta E (MeV) = 0.29742
Average alpha E (MeV) = 1.41511E-14

Composite Exposure Rate Conversion Factor = 6.54579020 R/hr per Ci/m2
Composite ECF per FGR table = 6.38560629 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.33049726 Rem/hr per Ci/m2

Fission Product Source

Point in time = 87.9205856 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct		Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	3.6672E+22	2.2725E+05	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	5.5762E+22	1.8883E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	4.5441E+22	1.6839E+05	0.0046	0.6032	0.0000
Ce-141	32.500	d	0.03	2.0676E+22	1.3794E+05	0.0771	0.1710	0.0000
Sr-89	50.570	d	0.06	2.9222E+22	1.2529E+05	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	1.6678E+22	9.2109E+04	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	1.6374E+19	9.1096E+04	0.0017	0.0375	0.0000
Pr-144	17.280	m	0.12	4.0059E+18	7.2381E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	9.5136E+22	7.2379E+04	0.0192	0.0918	0.0000
Pr-143	13.560	d	0.07	1.5851E+21	2.5346E+04	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	1.7417E+20	2.2506E+04	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	1.1513E+21	1.9548E+04	0.1830	0.3100	0.0000
Pm-147	2.6231	y	0.01	4.6345E+22	1.0489E+04	0.0000	0.0620	0.0000
Rh-106	30.000	s	0.67	1.2696E+16	7928.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.3623E+22	7928.	0.0000	0.0100	0.0000
Te-129m	33.600	d	0.30	8.4337E+20	5442.	0.0373	0.2660	0.0000
Nd-147	10.980	d	0.09	1.9071E+20	3766.	0.1410	0.2690	0.0000
Te-129	1.1600	h	0.29	7.6541E+17	3434.	0.0631	0.5420	0.0000
Cs-137	30.041	y	0.10	1.3998E+23	2766.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1343E+16	2611.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0627E+19	2486.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.2055E+23	2486.	0.0001	0.1958	0.0000
Nb-95m	3.6090	d	0.92	3.5972E+19	2161.	0.0712	0.1710	0.0000
Te-127m	109.00	d	1.84	7.9204E+20	1576.	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	2.7730E+18	1543.	0.0050	0.2245	0.0000
I-131	8.0230	d	0.02	3.8513E+19	1041.	0.3823	0.1920	0.0000
Pr-144m	6.9000	m	10.14	2.2074E+16	998.8	0.0121	0.0460	0.0000
Sb-125	2.7581	y	0.01	2.3740E+21	511.0	0.4367	0.0870	0.0000
Sn-119m	293.10	d	0.44	6.0385E+20	446.7	0.0114	0.0783	0.0000
Cd-115m	44.590	d	0.67	8.1632E+19	396.9	0.0339	0.6020	0.0000
Kr-85	10.750	y	0.21	6.9195E+21	382.1	0.0022	0.2507	0.0000
Xe-131m	11.930	d	0.13	1.3980E+19	254.1	0.0200	0.1430	0.0000
Sn-123	129.20	d	0.31	1.2252E+20	205.6	0.0077	0.5232	0.0000
Eu-156	15.190	d	0.53	1.0689E+19	152.6	1.3300	0.4250	0.0000
Eu-155	4.7531	y	0.29	1.0588E+21	132.2	0.0613	0.0650	0.0000
Te-125m	57.400	d	0.26	1.9533E+19	73.78	0.0360	0.1110	0.0000
Xe-133	5.2440	d	0.08	1.6903E+18	69.89	0.0463	0.1360	0.0000
Sm-151	89.992	y	6.66	9.9408E+21	65.58	0.0000	0.1250	0.0000
Cs-136	13.030	d	0.54	2.8771E+18	47.88	2.1700	0.1350	0.0000
Sn-125	9.6400	d	0.31	1.6902E+18	38.02	0.3140	0.8110	0.0000
H-3	12.330	y	0.16	3.1757E+20	15.29	0.0000	0.0057	0.0000
Ag-111	7.4500	d	0.13	4.9039E+17	14.27	0.0270	0.3550	0.0000
Sb-124	60.200	d	0.05	3.6018E+18	12.97	1.8500	0.3900	0.0000
Y-89m	15.660	s	0.03	1.0474E+13	12.53	0.9014	0.0077	0.0000
Sb-126	12.400	d	0.81	4.9510E+17	8.657	2.7500	0.3530	0.0000
Cs-134	2.0650	y	0.03	5.9959E+18	1.724	1.5500	0.1640	0.0000
Sn-121m	55.011	y	9.09	1.1321E+20	1.222	0.0050	0.0351	0.0000
Sn-121	1.1280	d	0.15	4.9321E+15	0.9481	0.0000	0.1150	0.0000
Cd-113m	14.100	y	3.55	1.6928E+19	0.7127	0.0002	0.1830	0.0000
Sn-117m	13.600	d	0.29	3.7653E+16	0.6003	0.1580	0.1610	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867383D+24

Total number of nuclides = 408
Total activity (Ci) = 1.30257E+06

Total number of decays = 1.30780E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 80.613
Average chain length = 3.5476

Average gamma E (MeV) = 0.33271
Average beta E (MeV) = 0.29656
Average alpha E (MeV) = 2.39144E-14

Composite Exposure Rate Conversion Factor = 6.43449116 R/hr per Ci/m2
Composite ECF per FGR table = 6.17030621 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.15892029 Rem/hr per Ci/m2

Fission Product Source

Point in time = 109.804245 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	3.3235E+22	2.0595E+05	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	4.4000E+22	1.4900E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	3.5064E+22	1.2994E+05	0.0046	0.6032	0.0000
Sr-89	50.570	d	0.06	2.1649E+22	9.2824E+04	0.0010	0.5830	0.0000
Ce-141	32.500	d	0.03	1.2965E+22	8.6495E+04	0.0771	0.1710	0.0000
Pr-144	17.280	m	0.12	3.7982E+18	6.8629E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	9.0205E+22	6.8627E+04	0.0192	0.0918	0.0000
Ru-103	39.260	d	0.05	1.1333E+22	6.2591E+04	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	1.1126E+19	6.1902E+04	0.0017	0.0375	0.0000
Pm-147	2.6231	y	0.01	4.5758E+22	1.0356E+04	0.0000	0.0620	0.0000
Pr-143	13.560	d	0.07	5.1789E+20	8281.	0.0003	0.3151	0.0000
Rh-106	30.000	s	0.67	1.2190E+16	7612.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.3079E+22	7612.	0.0000	0.0100	0.0000
La-140	1.6780	d	0.01	5.3101E+19	6862.	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	3.5101E+20	5960.	0.1830	0.3100	0.0000
Te-129m	33.600	d	0.30	5.3698E+20	3465.	0.0373	0.2660	0.0000
Cs-137	30.041	y	0.10	1.3979E+23	2762.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1314E+16	2608.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0583E+19	2483.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.2037E+23	2482.	0.0001	0.1958	0.0000
Te-129	1.1600	h	0.29	4.8734E+17	2186.	0.0631	0.5420	0.0000
Nb-95m	3.6090	d	0.92	2.8384E+19	1705.	0.0712	0.1710	0.0000
Te-127m	109.00	d	1.84	6.8914E+20	1371.	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	2.4126E+18	1343.	0.0050	0.2245	0.0000
Pr-144m	6.9000	m	10.14	2.0930E+16	947.1	0.0121	0.0460	0.0000
Nd-147	10.980	d	0.09	4.7907E+19	946.0	0.1410	0.2690	0.0000
Sb-125	2.7581	y	0.01	2.3398E+21	503.6	0.4367	0.0870	0.0000
Sn-119m	293.10	d	0.44	5.7340E+20	424.2	0.0114	0.0783	0.0000
Kr-85	10.750	y	0.21	6.8929E+21	380.6	0.0022	0.2507	0.0000
Cd-115m	44.590	d	0.67	5.8093E+19	282.5	0.0339	0.6020	0.0000
Sn-123	129.20	d	0.31	1.0895E+20	182.8	0.0077	0.5232	0.0000
I-131	8.0230	d	0.02	5.8144E+18	157.1	0.3823	0.1920	0.0000
Eu-155	4.7531	y	0.29	1.0496E+21	131.1	0.0613	0.0650	0.0000
Te-125m	57.400	d	0.26	2.1975E+19	83.01	0.0360	0.1110	0.0000
Xe-131m	11.930	d	0.13	4.0861E+18	74.26	0.0200	0.1430	0.0000
Sm-151	89.992	y	6.66	9.9363E+21	65.55	0.0000	0.1250	0.0000
Eu-156	15.190	d	0.53	3.9379E+18	56.21	1.3300	0.4250	0.0000
H-3	12.330	y	0.16	3.1651E+20	15.24	0.0000	0.0057	0.0000
Cs-136	13.030	d	0.54	8.9822E+17	14.95	2.1700	0.1350	0.0000
Sb-124	60.200	d	0.05	2.7996E+18	10.08	1.8500	0.3900	0.0000
Y-89m	15.660	s	0.03	7.7594E+12	9.282	0.9014	0.0077	0.0000
Sn-125	9.6400	d	0.31	3.5041E+17	7.881	0.3140	0.8110	0.0000
Xe-133	5.2440	d	0.08	9.3697E+16	3.874	0.0463	0.1360	0.0000
Sb-126	12.400	d	0.81	1.4574E+17	2.548	2.7500	0.3530	0.0000
Ag-111	7.4500	d	0.13	6.4017E+16	1.863	0.0270	0.3550	0.0000
Cs-134	2.0650	y	0.03	5.8765E+18	1.689	1.5500	0.1640	0.0000
Sn-121m	55.011	y	9.09	1.1312E+20	1.221	0.0050	0.0351	0.0000
Sn-121	1.1280	d	0.15	4.9284E+15	0.9473	0.0000	0.1150	0.0000
Cd-113m	14.100	y	3.55	1.6878E+19	0.7106	0.0002	0.1830	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867380D+24

Total number of nuclides = 403
Total activity (Ci) = 9.97346E+05

Total number of decays = 1.31577E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 81.104
Average chain length = 3.5476

Average gamma E (MeV) = 0.33003
Average beta E (MeV) = 0.30035
Average alpha E (MeV) = 4.03809E-14

Composite Exposure Rate Conversion Factor = 6.50368071 R/hr per Ci/m2
Composite ECF per FGR table = 6.14693832 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.12536240 Rem/hr per Ci/m2

Fission Product Source

Point in time = 137.134811 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	2.7927E+22	1.7306E+05	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	3.2731E+22	1.1084E+05	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	2.5366E+22	9.3999E+04	0.0046	0.6032	0.0000
Pr-144	17.280	m	0.12	3.5540E+18	6.4216E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	8.4404E+22	6.4214E+04	0.0192	0.0918	0.0000
Sr-89	50.570	d	0.06	1.4885E+22	6.3822E+04	0.0010	0.5830	0.0000
Ce-141	32.500	d	0.03	7.2379E+21	4.8288E+04	0.0771	0.1710	0.0000
Ru-103	39.260	d	0.05	6.9950E+21	3.8632E+04	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	6.8674E+18	3.8207E+04	0.0017	0.0375	0.0000
Pm-147	2.6231	y	0.01	4.4901E+22	1.0162E+04	0.0000	0.0620	0.0000
Rh-106	30.000	s	0.67	1.1586E+16	7235.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.2431E+22	7235.	0.0000	0.0100	0.0000
Cs-137	30.041	y	0.10	1.3954E+23	2758.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1277E+16	2603.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0528E+19	2478.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.2016E+23	2478.	0.0001	0.1958	0.0000
Pr-143	13.560	d	0.07	1.2809E+20	2048.	0.0003	0.3151	0.0000
Te-129m	33.600	d	0.30	3.0556E+20	1972.	0.0373	0.2660	0.0000
La-140	1.6780	d	0.01	1.2046E+19	1557.	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	7.9626E+19	1352.	0.1830	0.3100	0.0000
Nb-95m	3.6090	d	0.92	2.1115E+19	1269.	0.0712	0.1710	0.0000
Te-129	1.1600	h	0.29	2.7731E+17	1244.	0.0631	0.5420	0.0000
Te-127m	109.00	d	1.84	5.7920E+20	1152.	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	2.0277E+18	1129.	0.0050	0.2245	0.0000
Pr-144m	6.9000	m	10.14	1.9584E+16	886.2	0.0121	0.0460	0.0000
Sb-125	2.7581	y	0.01	2.2965E+21	494.3	0.4367	0.0870	0.0000
Sn-119m	293.10	d	0.44	5.3751E+20	397.6	0.0114	0.0783	0.0000
Kr-85	10.750	y	0.21	6.8597E+21	378.8	0.0022	0.2507	0.0000
Cd-115m	44.590	d	0.67	3.7985E+19	184.7	0.0339	0.6020	0.0000
Nd-147	10.980	d	0.09	8.5330E+18	168.5	0.1410	0.2690	0.0000
Sn-123	129.20	d	0.31	9.4092E+19	157.9	0.0077	0.5232	0.0000
Eu-155	4.7531	y	0.29	1.0382E+21	129.7	0.0613	0.0650	0.0000
Te-125m	57.400	d	0.26	2.4103E+19	91.05	0.0360	0.1110	0.0000
Sm-151	89.992	y	6.66	9.9305E+21	65.51	0.0000	0.1250	0.0000
Eu-156	15.190	d	0.53	1.1314E+18	16.15	1.3300	0.4250	0.0000
Xe-131m	11.930	d	0.13	8.5627E+17	15.56	0.0200	0.1430	0.0000
H-3	12.330	y	0.16	3.1518E+20	15.17	0.0000	0.0057	0.0000
I-131	8.0230	d	0.02	5.4833E+17	14.82	0.3823	0.1920	0.0000
Sb-124	60.200	d	0.05	2.0437E+18	7.361	1.8500	0.3900	0.0000
Y-89m	15.660	s	0.03	5.3350E+12	6.382	0.9014	0.0077	0.0000
Cs-136	13.030	d	0.54	2.0988E+17	3.492	2.1700	0.1350	0.0000
Cs-134	2.0650	y	0.03	5.7308E+18	1.647	1.5500	0.1640	0.0000
Sn-121m	55.011	y	9.09	1.1301E+20	1.220	0.0050	0.0351	0.0000
Sn-125	9.6400	d	0.31	4.9104E+16	1.104	0.3140	0.8110	0.0000
Sn-121	1.1280	d	0.15	4.9238E+15	0.9465	0.0000	0.1150	0.0000
Cd-113m	14.100	y	3.55	1.6816E+19	0.7080	0.0002	0.1830	0.0000
Sb-126	12.400	d	0.81	3.1682E+16	0.5540	2.7500	0.3530	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000
Ag-111	7.4500	d	0.13	5.0345E+15	0.1465	0.0270	0.3550	0.0000
Xe-133	5.2440	d	0.08	2.5283E+15	0.1045	0.0463	0.1360	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867381D+24

Total number of nuclides = 394
Total activity (Ci) = 7.44982E+05

Total number of decays = 1.32331E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 81.569
Average chain length = 3.5476

Average gamma E (MeV) = 0.33204
Average beta E (MeV) = 0.31005
Average alpha E (MeV) = 6.91113E-14

Composite Exposure Rate Conversion Factor = 6.64553261 R/hr per Ci/m2
Composite ECF per FGR table = 6.20016098 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.15056276 Rem/hr per Ci/m2

Fission Product Source

Point in time = 171.267685 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	2.1401E+22	1.3261E+05	0.7645	0.0434	0.0000
Zr-95	64.030	d	0.01	2.2620E+22	7.6598E+04	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.6929E+22	6.2735E+04	0.0046	0.6032	0.0000
Pr-144	17.280	m	0.12	3.2709E+18	5.9100E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	7.7680E+22	5.9098E+04	0.0192	0.0918	0.0000
Sr-89	50.570	d	0.06	9.3232E+21	3.9975E+04	0.0010	0.5830	0.0000
Ce-141	32.500	d	0.03	3.4951E+21	2.3318E+04	0.0771	0.1710	0.0000
Ru-103	39.260	d	0.05	3.8289E+21	2.1146E+04	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	3.7590E+18	2.0914E+04	0.0017	0.0375	0.0000
Pm-147	2.6231	y	0.01	4.3814E+22	9916.	0.0000	0.0620	0.0000
Rh-106	30.000	s	0.67	1.0873E+16	6790.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.1666E+22	6790.	0.0000	0.0100	0.0000
Cs-137	30.041	y	0.10	1.3924E+23	2752.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1231E+16	2598.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0460E+19	2473.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.1989E+23	2472.	0.0001	0.1958	0.0000
Te-129m	33.600	d	0.30	1.5111E+20	975.1	0.0373	0.2660	0.0000
Te-127m	109.00	d	1.84	4.6619E+20	927.4	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	1.6321E+18	908.3	0.0050	0.2245	0.0000
Nb-95m	3.6090	d	0.92	1.4592E+19	876.7	0.0712	0.1710	0.0000
Pr-144m	6.9000	m	10.14	1.8023E+16	815.6	0.0121	0.0460	0.0000
Te-129	1.1600	h	0.29	1.3714E+17	615.2	0.0631	0.5420	0.0000
Sb-125	2.7581	y	0.01	2.2433E+21	482.8	0.4367	0.0870	0.0000
Kr-85	10.750	y	0.21	6.8185E+21	376.5	0.0022	0.2507	0.0000
Sn-119m	293.10	d	0.44	4.9582E+20	366.8	0.0114	0.0783	0.0000
Pr-143	13.560	d	0.07	2.2375E+19	357.8	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	1.8889E+18	244.1	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	1.2486E+19	212.0	0.1830	0.3100	0.0000
Sn-123	129.20	d	0.31	7.8347E+19	131.5	0.0077	0.5232	0.0000
Eu-155	4.7531	y	0.29	1.0241E+21	127.9	0.0613	0.0650	0.0000
Cd-115m	44.590	d	0.67	2.2345E+19	108.7	0.0339	0.6020	0.0000
Te-125m	57.400	d	0.26	2.5731E+19	97.20	0.0360	0.1110	0.0000
Sm-151	89.992	y	6.66	9.9234E+21	65.46	0.0000	0.1250	0.0000
Nd-147	10.980	d	0.09	9.8925E+17	19.54	0.1410	0.2690	0.0000
H-3	12.330	y	0.16	3.1353E+20	15.09	0.0000	0.0057	0.0000
Sb-124	60.200	d	0.05	1.3796E+18	4.969	1.8500	0.3900	0.0000
Y-89m	15.660	s	0.03	3.3416E+12	3.997	0.9014	0.0077	0.0000
Eu-156	15.190	d	0.53	2.3834E+17	3.402	1.3300	0.4250	0.0000
Xe-131m	11.930	d	0.13	1.1941E+17	2.170	0.0200	0.1430	0.0000
Cs-134	2.0650	y	0.03	5.5538E+18	1.597	1.5500	0.1640	0.0000
Sn-121m	55.011	y	9.09	1.1288E+20	1.218	0.0050	0.0351	0.0000
Sn-121	1.1280	d	0.15	4.9180E+15	0.9453	0.0000	0.1150	0.0000
I-131	8.0230	d	0.02	2.8731E+16	0.7765	0.3823	0.1920	0.0000
Cd-113m	14.100	y	3.55	1.6739E+19	0.7047	0.0002	0.1830	0.0000
Cs-136	13.030	d	0.54	3.4151E+16	0.5683	2.1700	0.1350	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000
Sn-125	9.6400	d	0.31	4.2193E+15	9.4902E-02	0.3140	0.8110	0.0000
Sb-126	12.400	d	0.81	4.7586E+15	8.3209E-02	2.7500	0.3530	0.0000
Zr-93	0.15300E+07	y	6.54	1.3986E+23	5.4265E-02	0.0018	0.0471	0.0000
Cs-135	0.23000E+07	y	13.04	1.5102E+23	3.8978E-02	0.0000	0.0560	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867382D+24

Total number of nuclides = 387
Total activity (Ci) = 5.37032E+05

Total number of decays = 1.33022E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 81.995
Average chain length = 3.5476

Average gamma E (MeV) = 0.32953
Average beta E (MeV) = 0.32726
Average alpha E (MeV) = 1.21386E-13

Composite Exposure Rate Conversion Factor = 6.70561600 R/hr per Ci/m2
Composite ECF per FGR table = 6.16315746 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 4.11916494 Rem/hr per Ci/m2

Fission Product Source

Point in time = 213.896667 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	1.4664E+22	9.0870E+04	0.7645	0.0434	0.0000
Pr-144	17.280	m	0.12	2.9487E+18	5.3280E+04	0.0320	1.2100	0.0000
Ce-144	285.00	d	0.07	7.0030E+22	5.3278E+04	0.0192	0.0918	0.0000
Zr-95	64.030	d	0.01	1.4258E+22	4.8284E+04	0.7328	0.1200	0.0000
Y-91	58.510	d	0.10	1.0217E+22	3.7861E+04	0.0046	0.6032	0.0000
Sr-89	50.570	d	0.06	5.1977E+21	2.2286E+04	0.0010	0.5830	0.0000
Ru-103	39.260	d	0.05	1.8039E+21	9963.	0.4850	0.1100	0.0000
Rh-103m	56.120	m	0.00	1.7710E+18	9853.	0.0017	0.0375	0.0000
Pm-147	2.6231	y	0.01	4.2484E+22	9615.	0.0000	0.0620	0.0000
Ce-141	32.500	d	0.03	1.4080E+21	9394.	0.0771	0.1710	0.0000
Rh-106	30.000	s	0.67	1.0044E+16	6272.	0.2100	1.4110	0.0000
Ru-106	1.0200	y	0.27	1.0776E+22	6272.	0.0000	0.0100	0.0000
Cs-137	30.041	y	0.10	1.3887E+23	2744.	0.0015	0.2500	0.0000
Ba-137m	2.5520	m	0.04	2.1174E+16	2591.	0.5990	0.0652	0.0000
Y-90	2.6710	d	0.12	3.0374E+19	2466.	0.0020	0.9336	0.0000
Sr-90	28.791	y	0.21	1.1955E+23	2465.	0.0001	0.1958	0.0000
Pr-144m	6.9000	m	10.14	1.6248E+16	735.3	0.0121	0.0460	0.0000
Te-127m	109.00	d	1.84	3.5550E+20	707.2	0.0111	0.0821	0.0000
Te-127	9.3500	h	0.64	1.2446E+18	692.7	0.0050	0.2245	0.0000
Nb-95m	3.6090	d	0.92	9.1981E+18	552.6	0.0712	0.1710	0.0000
Sb-125	2.7581	y	0.01	2.1784E+21	468.9	0.4367	0.0870	0.0000
Te-129m	33.600	d	0.30	6.2715E+19	404.7	0.0373	0.2660	0.0000
Kr-85	10.750	y	0.21	6.7674E+21	373.7	0.0022	0.2507	0.0000
Sn-119m	293.10	d	0.44	4.4828E+20	331.6	0.0114	0.0783	0.0000
Te-129	1.1600	h	0.29	5.6917E+16	255.3	0.0631	0.5420	0.0000
Eu-155	4.7531	y	0.29	1.0068E+21	125.8	0.0613	0.0650	0.0000
Sn-123	129.20	d	0.31	6.2331E+19	104.6	0.0077	0.5232	0.0000
Te-125m	57.400	d	0.26	2.6707E+19	100.9	0.0360	0.1110	0.0000
Sm-151	89.992	y	6.66	9.9145E+21	65.40	0.0000	0.1250	0.0000
Cd-115m	44.590	d	0.67	1.1518E+19	56.01	0.0339	0.6020	0.0000
Pr-143	13.560	d	0.07	2.5316E+18	40.48	0.0003	0.3151	0.0000
La-140	1.6780	d	0.01	1.8677E+17	24.13	2.3200	0.5340	0.0000
Ba-140	12.770	d	0.12	1.2346E+18	20.96	0.1830	0.3100	0.0000
H-3	12.330	y	0.16	3.1148E+20	15.00	0.0000	0.0057	0.0000
Sb-124	60.200	d	0.05	8.4445E+17	3.042	1.8500	0.3900	0.0000
Y-89m	15.660	s	0.03	1.8629E+12	2.229	0.9014	0.0077	0.0000
Cs-134	2.0650	y	0.03	5.3404E+18	1.535	1.5500	0.1640	0.0000
Nd-147	10.980	d	0.09	6.7078E+16	1.325	0.1410	0.2690	0.0000
Sn-121m	55.011	y	9.09	1.1272E+20	1.216	0.0050	0.0351	0.0000
Sn-121	1.1280	d	0.15	4.9107E+15	0.9439	0.0000	0.1150	0.0000
Cd-113m	14.100	y	3.55	1.6643E+19	0.7007	0.0002	0.1830	0.0000
Eu-156	15.190	d	0.53	3.4072E+16	0.4863	1.3300	0.4250	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000
Xe-131m	11.930	d	0.13	1.0088E+16	0.1833	0.0200	0.1430	0.0000
Cs-136	13.030	d	0.54	3.5363E+15	5.8846E-02	2.1700	0.1350	0.0000
Zr-93	0.15300E+07	y	6.54	1.3986E+23	5.4265E-02	0.0018	0.0471	0.0000
Cs-135	0.23000E+07	y	13.04	1.5102E+23	3.8978E-02	0.0000	0.0560	0.0000
I-131	8.0230	d	0.02	7.2255E+14	1.9527E-02	0.3823	0.1920	0.0000
Eu-154	8.5942	y	0.04	2.0422E+17	1.4107E-02	1.2500	0.2790	0.0000
Sb-126	12.400	d	0.81	5.0071E+14	8.7554E-03	2.7500	0.3530	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 377
Total activity (Ci) = 3.72579E+05

Total number of decays = 1.33633E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 82.371
Average chain length = 3.5476

Average gamma E (MeV) = 0.31298
Average beta E (MeV) = 0.35442
Average alpha E (MeV) = 2.19640E-13

Composite Exposure Rate Conversion Factor = 6.52152205 R/hr per Ci/m2
Composite ECF per FGR table = 5.86272097 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.91229081 Rem/hr per Ci/m2

Fission Product Source

Point in time = 267.136078 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Nb-95	34.990	d	0.02	8.7780E+21	5.4396E+04	0.7645	0.0434	0.0000	0.0000
Pr-144	17.280	m	0.12	2.5906E+18	4.6809E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00	d	0.07	6.1525E+22	4.6807E+04	0.0192	0.0918	0.0000	0.0000
Zr-95	64.030	d	0.01	8.0126E+21	2.7133E+04	0.7328	0.1200	0.0000	0.0000
Y-91	58.510	d	0.10	5.4375E+21	2.0150E+04	0.0046	0.6032	0.0000	0.0000
Sr-89	50.570	d	0.06	2.5055E+21	1.0742E+04	0.0010	0.5830	0.0000	0.0000
Pm-147	2.6231	y	0.01	4.0879E+22	9252.	0.0000	0.0620	0.0000	0.0000
Rh-106	30.000	s	0.67	9.0965E+15	5680.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200	y	0.27	9.7601E+21	5680.	0.0000	0.0100	0.0000	0.0000
Ru-103	39.260	d	0.05	7.0468E+20	3892.	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120	m	0.00	6.9182E+17	3849.	0.0017	0.0375	0.0000	0.0000
Ce-141	32.500	d	0.03	4.5236E+20	3018.	0.0771	0.1710	0.0000	0.0000
Cs-137	30.041	y	0.10	1.3840E+23	2735.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.1103E+16	2582.	0.5990	0.0652	0.0000	0.0000
Y-90	2.6710	d	0.12	3.0268E+19	2457.	0.0020	0.9336	0.0000	0.0000
Sr-90	28.791	y	0.21	1.1913E+23	2456.	0.0001	0.1958	0.0000	0.0000
Pr-144m	6.9000	m	10.14	1.4275E+16	646.0	0.0121	0.0460	0.0000	0.0000
Te-127m	109.00	d	1.84	2.5340E+20	504.1	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	8.8711E+17	493.7	0.0050	0.2245	0.0000	0.0000
Sb-125	2.7581	y	0.01	2.1001E+21	452.0	0.4367	0.0870	0.0000	0.0000
Kr-85	10.750	y	0.21	6.7041E+21	370.2	0.0022	0.2507	0.0000	0.0000
Nb-95m	3.6090	d	0.92	5.1689E+18	310.5	0.0712	0.1710	0.0000	0.0000
Sn-119m	293.10	d	0.44	3.9524E+20	292.4	0.0114	0.0783	0.0000	0.0000
Te-129m	33.600	d	0.30	2.0912E+19	134.9	0.0373	0.2660	0.0000	0.0000
Eu-155	4.7531	y	0.29	9.8566E+20	123.1	0.0613	0.0650	0.0000	0.0000
Te-125m	57.400	d	0.26	2.6952E+19	101.8	0.0360	0.1110	0.0000	0.0000
Te-129	1.1600	h	0.29	1.8978E+16	85.14	0.0631	0.5420	0.0000	0.0000
Sn-123	129.20	d	0.31	4.6844E+19	78.61	0.0077	0.5232	0.0000	0.0000
Sm-151	89.992	y	6.66	9.9033E+21	65.33	0.0000	0.1250	0.0000	0.0000
Cd-115m	44.590	d	0.67	5.0346E+18	24.48	0.0339	0.6020	0.0000	0.0000
H-3	12.330	y	0.16	3.0893E+20	14.87	0.0000	0.0057	0.0000	0.0000
Pr-143	13.560	d	0.07	1.6653E+17	2.663	0.0003	0.3151	0.0000	0.0000
Sb-124	60.200	d	0.05	4.5746E+17	1.648	1.8500	0.3900	0.0000	0.0000
Cs-134	2.0650	y	0.03	5.0854E+18	1.462	1.5500	0.1640	0.0000	0.0000
La-140	1.6780	d	0.01	1.0382E+16	1.342	2.3200	0.5340	0.0000	0.0000
Sn-121m	55.011	y	9.09	1.1251E+20	1.214	0.0050	0.0351	0.0000	0.0000
Ba-140	12.770	d	0.12	6.8629E+16	1.165	0.1830	0.3100	0.0000	0.0000
Y-89m	15.660	s	0.03	8.9799E+11	1.074	0.9014	0.0077	0.0000	0.0000
Sn-121	1.1280	d	0.15	4.9017E+15	0.9422	0.0000	0.1150	0.0000	0.0000
Cd-113m	14.100	y	3.55	1.6524E+19	0.6957	0.0002	0.1830	0.0000	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000	0.0000
Zr-93	0.15300E+07	y	6.54	1.3986E+23	5.4265E-02	0.0018	0.0471	0.0000	0.0000
Nd-147	10.980	d	0.09	2.3279E+15	4.5969E-02	0.1410	0.2690	0.0000	0.0000
Eu-156	15.190	d	0.53	3.0013E+15	4.2842E-02	1.3300	0.4250	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	1.5102E+23	3.8978E-02	0.0000	0.0560	0.0000	0.0000
Eu-154	8.5942	y	0.04	2.0184E+17	1.3942E-02	1.2500	0.2790	0.0000	0.0000
Sn-126	0.23000E+06	y	6.09	3.2828E+21	8.4730E-03	0.0570	0.1250	0.0000	0.0000
Sb-126m	19.100	m	1.05	5.1832E+11	8.4730E-03	1.5500	0.6320	0.0000	0.0000
Xe-131m	11.930	d	0.13	4.5837E+14	8.3307E-03	0.0200	0.1430	0.0000	0.0000
Sb-126n	11.000	s	18.18	3.3298E+09	5.6709E-03	0.0003	0.0214	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 371
Total activity (Ci) = 2.51349E+05

Total number of decays = 1.34154E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 82.692
Average chain length = 3.5476

Average gamma E (MeV) = 0.27498
Average beta E (MeV) = 0.39344
Average alpha E (MeV) = 4.05461E-13

Composite Exposure Rate Conversion Factor = 5.95926666 R/hr per Ci/m2
Composite ECF per FGR table = 5.16230869 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 3.43723249 Rem/hr per Ci/m2

Fission Product Source

Point in time = 333.626343 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pr-144	17.280	m	0.12	2.2038E+18	3.9820E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00	d	0.07	5.2338E+22	3.9818E+04	0.0192	0.0918	0.0000	0.0000
Nb-95	34.990	d	0.02	4.4656E+21	2.7672E+04	0.7645	0.0434	0.0000	0.0000
Zr-95	64.030	d	0.01	3.9010E+21	1.3210E+04	0.7328	0.1200	0.0000	0.0000
Y-91	58.510	d	0.10	2.4735E+21	9166.	0.0046	0.6032	0.0000	0.0000
Pm-147	2.6231	y	0.01	3.8959E+22	8817.	0.0000	0.0620	0.0000	0.0000
Rh-106	30.000	s	0.67	8.0380E+15	5019.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200	y	0.27	8.6244E+21	5019.	0.0000	0.0100	0.0000	0.0000
Sr-89	50.570	d	0.06	1.0071E+21	4318.	0.0010	0.5830	0.0000	0.0000
Cs-137	30.041	y	0.10	1.3782E+23	2724.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.1014E+16	2571.	0.5990	0.0652	0.0000	0.0000
Y-90	2.6710	d	0.12	3.0135E+19	2446.	0.0020	0.9336	0.0000	0.0000
Sr-90	28.791	y	0.21	1.1861E+23	2446.	0.0001	0.1958	0.0000	0.0000
Ru-103	39.260	d	0.05	2.1786E+20	1203.	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120	m	0.00	2.1388E+17	1190.	0.0017	0.0375	0.0000	0.0000
Ce-141	32.500	d	0.03	1.0955E+20	730.9	0.0771	0.1710	0.0000	0.0000
Pr-144m	6.9000	m	10.14	1.2144E+16	549.5	0.0121	0.0460	0.0000	0.0000
Sb-125	2.7581	y	0.01	2.0062E+21	431.8	0.4367	0.0870	0.0000	0.0000
Kr-85	10.750	y	0.21	6.6258E+21	365.9	0.0022	0.2507	0.0000	0.0000
Te-127m	109.00	d	1.84	1.6602E+20	330.3	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	5.8123E+17	323.5	0.0050	0.2245	0.0000	0.0000
Sn-119m	293.10	d	0.44	3.3774E+20	249.8	0.0114	0.0783	0.0000	0.0000
Nb-95m	3.6090	d	0.92	2.5165E+18	151.2	0.0712	0.1710	0.0000	0.0000
Eu-155	4.7531	y	0.29	9.5984E+20	119.9	0.0613	0.0650	0.0000	0.0000
Te-125m	57.400	d	0.26	2.6481E+19	100.0	0.0360	0.1110	0.0000	0.0000
Sm-151	89.992	y	6.66	9.8895E+21	65.24	0.0000	0.1250	0.0000	0.0000
Sn-123	129.20	d	0.31	3.2790E+19	55.03	0.0077	0.5232	0.0000	0.0000
Te-129m	33.600	d	0.30	5.3050E+18	34.23	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	4.8146E+15	21.60	0.0631	0.5420	0.0000	0.0000
H-3	12.330	y	0.16	3.0579E+20	14.72	0.0000	0.0057	0.0000	0.0000
Cd-115m	44.590	d	0.67	1.7910E+18	8.709	0.0339	0.6020	0.0000	0.0000
Cs-134	2.0650	y	0.03	4.7840E+18	1.375	1.5500	0.1640	0.0000	0.0000
Sn-121m	55.011	y	9.09	1.1225E+20	1.211	0.0050	0.0351	0.0000	0.0000
Sn-121	1.1280	d	0.15	4.8905E+15	0.9401	0.0000	0.1150	0.0000	0.0000
Sb-124	60.200	d	0.05	2.1275E+17	0.7663	1.8500	0.3900	0.0000	0.0000
Cd-113m	14.100	y	3.55	1.6377E+19	0.6895	0.0002	0.1830	0.0000	0.0000
Y-89m	15.660	s	0.03	3.6097E+11	0.4318	0.9014	0.0077	0.0000	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000	0.0000
Pr-143	13.560	d	0.07	5.5644E+15	8.8976E-02	0.0003	0.3151	0.0000	0.0000
Zr-93	0.15300E+07	y	6.54	1.3986E+23	5.4265E-02	0.0018	0.0471	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	1.5102E+23	3.8978E-02	0.0000	0.0560	0.0000	0.0000
La-140	1.6780	d	0.01	2.8112E+14	3.6326E-02	2.3200	0.5340	0.0000	0.0000
Ba-140	12.770	d	0.12	1.8583E+15	3.1553E-02	0.1830	0.3100	0.0000	0.0000
Eu-154	8.5942	y	0.04	1.9889E+17	1.3739E-02	1.2500	0.2790	0.0000	0.0000
Sn-126	0.23000E+06	y	6.09	3.2828E+21	8.4729E-03	0.0570	0.1250	0.0000	0.0000
Sb-126m	19.100	m	1.05	5.1832E+11	8.4729E-03	1.5500	0.6320	0.0000	0.0000
Sb-126n	11.000	s	18.18	3.3298E+09	5.6709E-03	0.0003	0.0214	0.0000	0.0000
Tm-171	1.9200	y	0.52	1.5740E+16	4.8667E-03	0.0006	0.0247	0.0000	0.0000
Ba-133	10.540	y	0.09	5.9788E+16	3.3674E-03	0.4040	0.0547	0.0000	0.0000
Ce-139	137.60	d	0.01	1.8625E+15	2.9349E-03	0.1600	0.0331	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867379D+24

Total number of nuclides = 367
Total activity (Ci) = 1.68999E+05

Total number of decays = 1.34591E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 82.962
Average chain length = 3.5476

Average gamma E (MeV) = 0.21538
Average beta E (MeV) = 0.44169
Average alpha E (MeV) = 7.45133E-13

Composite Exposure Rate Conversion Factor = 5.00111341 R/hr per Ci/m2
Composite ECF per FGR table = 4.05908966 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.69227314 Rem/hr per Ci/m2

Fission Product Source

Point in time = 1.14079583 yrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pr-144	17.280	m	0.12	1.8008E+18	3.2538E+04	0.0320	1.2100	0.0000	0.0000
Ce-144	285.00	d	0.07	4.2767E+22	3.2537E+04	0.0192	0.0918	0.0000	0.0000
Nb-95	34.990	d	0.02	1.8677E+21	1.1574E+04	0.7645	0.0434	0.0000	0.0000
Pm-147	2.6231	y	0.01	3.6687E+22	8303.	0.0000	0.0620	0.0000	0.0000
Zr-95	64.030	d	0.01	1.5877E+21	5376.	0.7328	0.1200	0.0000	0.0000
Rh-106	30.000	s	0.67	6.8873E+15	4301.	0.2100	1.4110	0.0000	0.0000
Ru-106	1.0200	y	0.27	7.3898E+21	4301.	0.0000	0.0100	0.0000	0.0000
Y-91	58.510	d	0.10	9.2485E+20	3427.	0.0046	0.6032	0.0000	0.0000
Cs-137	30.041	y	0.10	1.3710E+23	2709.	0.0015	0.2500	0.0000	0.0000
Ba-137m	2.5520	m	0.04	2.0904E+16	2558.	0.5990	0.0652	0.0000	0.0000
Y-90	2.6710	d	0.12	2.9971E+19	2433.	0.0020	0.9336	0.0000	0.0000
Sr-90	28.791	y	0.21	1.1796E+23	2432.	0.0001	0.1958	0.0000	0.0000
Sr-89	50.570	d	0.06	3.2268E+20	1384.	0.0010	0.5830	0.0000	0.0000
Pr-144m	6.9000	m	10.14	9.9229E+15	449.0	0.0121	0.0460	0.0000	0.0000
Sb-125	2.7581	y	0.01	1.8947E+21	407.8	0.4367	0.0870	0.0000	0.0000
Kr-85	10.750	y	0.21	6.5294E+21	360.6	0.0022	0.2507	0.0000	0.0000
Ru-103	39.260	d	0.05	5.0286E+19	277.7	0.4850	0.1100	0.0000	0.0000
Rh-103m	56.120	m	0.00	4.9369E+16	274.7	0.0017	0.0375	0.0000	0.0000
Sn-119m	293.10	d	0.44	2.7752E+20	205.3	0.0114	0.0783	0.0000	0.0000
Te-127m	109.00	d	1.84	9.7912E+19	194.8	0.0111	0.0821	0.0000	0.0000
Te-127	9.3500	h	0.64	3.4278E+17	190.8	0.0050	0.2245	0.0000	0.0000
Ce-141	32.500	d	0.03	1.8641E+19	124.4	0.0771	0.1710	0.0000	0.0000
Eu-155	4.7531	y	0.29	9.2853E+20	116.0	0.0613	0.0650	0.0000	0.0000
Te-125m	57.400	d	0.26	2.5384E+19	95.89	0.0360	0.1110	0.0000	0.0000
Sm-151	89.992	y	6.66	9.8722E+21	65.12	0.0000	0.1250	0.0000	0.0000
Nb-95m	3.6090	d	0.92	1.0242E+18	61.53	0.0712	0.1710	0.0000	0.0000
Sn-123	129.20	d	0.31	2.1002E+19	35.25	0.0077	0.5232	0.0000	0.0000
H-3	12.330	y	0.16	3.0190E+20	14.54	0.0000	0.0057	0.0000	0.0000
Te-129m	33.600	d	0.30	9.5655E+17	6.173	0.0373	0.2660	0.0000	0.0000
Te-129	1.1600	h	0.29	8.6813E+14	3.894	0.0631	0.5420	0.0000	0.0000
Cd-115m	44.590	d	0.67	4.9258E+17	2.395	0.0339	0.6020	0.0000	0.0000
Cs-134	2.0650	y	0.03	4.4325E+18	1.274	1.5500	0.1640	0.0000	0.0000
Sn-121m	55.011	y	9.09	1.1193E+20	1.208	0.0050	0.0351	0.0000	0.0000
Sn-121	1.1280	d	0.15	4.8765E+15	0.9374	0.0000	0.1150	0.0000	0.0000
Cd-113m	14.100	y	3.55	1.6195E+19	0.6818	0.0002	0.1830	0.0000	0.0000
Tc-99	0.21400E+06	y	3.74	1.3606E+23	0.3774	0.0000	0.0846	0.0000	0.0000
Sb-124	60.200	d	0.05	8.1776E+16	0.2945	1.8500	0.3900	0.0000	0.0000
Y-89m	15.660	s	0.03	1.1565E+11	0.1384	0.9014	0.0077	0.0000	0.0000
Zr-93	0.15300E+07	y	6.54	1.3986E+23	5.4265E-02	0.0018	0.0471	0.0000	0.0000
Cs-135	0.23000E+07	y	13.04	1.5102E+23	3.8978E-02	0.0000	0.0560	0.0000	0.0000
Eu-154	8.5942	y	0.04	1.9528E+17	1.3489E-02	1.2500	0.2790	0.0000	0.0000
Sn-126	0.23000E+06	y	6.09	3.2828E+21	8.4729E-03	0.0570	0.1250	0.0000	0.0000
Sb-126m	19.100	m	1.05	5.1832E+11	8.4729E-03	1.5500	0.6320	0.0000	0.0000
Sb-126n	11.000	s	18.18	3.3298E+09	5.6709E-03	0.0003	0.0214	0.0000	0.0000
Tm-171	1.9200	y	0.52	1.4500E+16	4.4832E-03	0.0006	0.0247	0.0000	0.0000
Ba-133	10.540	y	0.09	5.8901E+16	3.3174E-03	0.4040	0.0547	0.0000	0.0000
Nb-93m	16.130	y	0.85	6.9044E+16	2.5410E-03	0.0018	0.0282	0.0000	0.0000
Ce-139	137.60	d	0.01	1.2258E+15	1.9316E-03	0.1600	0.0331	0.0000	0.0000
Gd-153	240.40	d	0.42	1.5436E+15	1.3922E-03	0.1020	0.0399	0.0000	0.0000
Pr-143	13.560	d	0.07	7.9788E+13	1.2758E-03	0.0003	0.3151	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 4.572982105867385D+24
Current number of atoms = 4.572982105867378D+24

Total number of nuclides = 356
Total activity (Ci) = 1.16763E+05

Total number of decays = 1.34962E+25
Asympt number of decays = 1.62233E+25
Percent of decays = 83.191
Average chain length = 3.5476

Average gamma E (MeV) = 0.14789
Average beta E (MeV) = 0.48767
Average alpha E (MeV) = 1.32182E-12

Composite Exposure Rate Conversion Factor = 3.86335707 R/hr per Ci/m2
Composite ECF per FGR table = 2.80692458 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.84868097 Rem/hr per Ci/m2

Appendix E. Actinide Source

This appendix contains a list of the fifty most-active radionuclides vs. time produced from the Hiroshima detonation. The points in time were chosen to be equally spaced in the logarithmic plane from 1×10^{-6} hours to 1×10^4 hours.

The activities that are presented are integrals over all space. The gamma and beta energies per decay listed in the table represent integrals over the emission spectrum for each radionuclide.

Actinide Source

Point in time = 0.00000000 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8367E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-239	2.3550	d	0.17	7.1540E+12	6.5867E-04	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	5.8070E+10	2.7903E-04	1.1900	0.2828	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9440E+09	1.6641E-04	0.3148	0.6243	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-226	30.570	m	0.33	9764.	9.9725E-11	0.0085	0.0000	0.0000	6.3060
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Th-231	1.0630	d	0.04	1128.	2.3008E-13	0.0225	0.0794	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	5.3120E+09	1.4735E-15	0.0320	0.0000	0.0000	4.7900
Th-228	1.9130	y	0.03	4534.	1.4070E-15	0.0031	0.0000	0.0000	5.4060
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Th-234	24.090	d	0.12	13.20	1.1881E-16	0.0094	0.0478	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pa-231	32771.	y	0.34	8.6762E+05	1.5717E-17	0.0394	0.0000	0.0000	4.9240
Po-213	0.42000E-05	s	19.05	7.0620E-13	3.1499E-18	0.0000	0.0000	0.0000	8.3760
Bi-210	5.0120	d	0.10	6.5342E-02	2.8268E-18	0.0004	0.3890	0.0000	4.6480
Bi-213	45.580	m	0.13	3.9330E-04	2.6942E-18	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	1.5951E-03	2.5516E-18	0.0001	0.1975	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.2557E-05	2.0745E-18	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	3.3246E-09	1.9282E-18	0.0002	0.0000	0.0000	7.0630
Ac-225	10.000	d	1.00	8.4098E-02	1.8235E-18	0.0176	0.0000	0.0000	5.7880
Pb-210	22.160	y	0.54	46.01	1.2325E-18	0.0045	0.0061	0.0000	0.0000
Ra-225	14.800	d	1.35	6.8511E-02	1.0037E-18	0.0137	0.0970	0.0000	0.0000
Th-229	7339.2	y	2.18	9324.	7.5417E-19	0.0340	0.0000	0.0000	4.9210
Pb-214	26.800	m	3.36	5.1662E-05	6.0188E-19	0.2513	0.2211	0.0000	0.0000
Bi-214	19.900	m	2.01	1.1920E-05	1.8702E-19	1.5100	0.6403	0.0000	0.0012
Po-218	3.0980	m	0.26	1.8510E-06	1.8655E-19	0.0000	0.0000	0.0000	6.0010
Rn-222	3.8230	d	0.01	2.2813E-03	1.2938E-19	0.0004	0.0000	0.0000	5.4890
Pa-234m	1.1700	m	2.56	3.0806E-07	8.2211E-20	0.0160	0.8101	0.0000	0.0000
Tl-209	2.2000	m	3.18	2.9976E-07	4.2542E-20	2.0300	0.6550	0.0000	0.0000
Po-210	138.40	d	0.00	2.0622E-02	3.2307E-20	0.0000	0.0000	0.0000	5.3040
Ra-223	11.430	d	0.17	7.0396E-04	1.3354E-20	0.1351	0.0000	0.0000	5.6640
Th-230	75392.	y	0.40	1445.	1.1378E-20	0.0004	0.0000	0.0000	4.6640
Po-215	0.17800E-02	s	0.56	8.6730E-13	9.1280E-21	0.0000	0.0000	0.0000	7.3920
Pb-211	36.100	m	0.55	7.5034E-07	6.4897E-21	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	4.0445E-08	5.8193E-21	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	5.8963E-08	3.8596E-21	0.0029	0.4953	0.0000	0.0000
Ac-228	6.1500	h	0.33	4.0887E-06	3.4597E-21	0.9930	0.3526	0.0000	0.0000
Rn-219	3.9600	s	1.26	7.3009E-10	3.4538E-21	0.0560	0.0000	0.0000	6.7530

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 74
Total activity (Ci) = 3.84272E+08

Total number of decays = 0.0000
Asympt number of decays = 1.80717E+27
Percent of decays = 0.0000
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40664E-08

Composite Exposure Rate Conversion Factor = 0.896252155 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491161 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718318 Rem/hr per Ci/m2

Actinide Source

Point in time = 9.99999978E-03 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8367E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
Np-239	2.3550	d	0.17	1.4196E+17	13.07	0.1740	0.1079	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
Np-240	1.0830	h	4.62	1.1153E+14	0.5359	1.1900	0.2828	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.9439E+09	1.6641E-04	0.3148	0.6243	0.0000	0.0000
Th-226	30.570	m	0.33	3.9766E+08	4.0616E-06	0.0085	0.0000	0.0000	6.3060
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-231	1.0630	d	0.04	4.7251E+07	9.6380E-09	0.0225	0.0794	0.0000	0.0000
Ra-222	38.000	s	1.32	751.4	3.7042E-10	0.0092	0.0000	0.0000	6.5470
Th-228	1.9130	y	0.03	1.3791E+08	4.2795E-11	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.1230E+14	3.1151E-11	0.0320	0.0000	0.0000	4.7900
Rn-218	0.35000E-01	s	25.71	4.3511E-02	2.3289E-11	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	1.8995E-04	2.1738E-11	0.0002	0.0000	0.0000	7.6870
Th-234	24.090	d	0.12	4.8799E+05	4.3923E-12	0.0094	0.0478	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pa-231	32771.	y	0.34	2.9971E+10	5.4293E-13	0.0394	0.0000	0.0000	4.9240
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Pu-239	24111.	y	0.05	2.4162E+09	5.9491E-14	0.0001	0.0000	0.0000	5.1000
Pu-240	6563.1	y	0.08	9.9386E+07	8.9897E-15	0.0000	0.0000	0.0000	5.1550
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Th-230	75392.	y	0.40	2.9362E+07	2.3120E-16	0.0004	0.0000	0.0000	4.6640
Pa-234m	1.1700	m	2.56	8.1255E-04	2.1684E-16	0.0160	0.8101	0.0000	0.0000
Th-229	7339.2	y	2.18	1.9897E+06	1.6095E-16	0.0340	0.0000	0.0000	4.9210
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Rn-220	55.800	s	0.54	6.4204E-05	2.1555E-17	0.0006	0.0000	0.0000	6.2880
Po-218	3.0980	m	0.26	4.3317E-05	4.3656E-18	0.0000	0.0000	0.0000	6.0010
Pb-209	3.2530	h	0.43	2.1305E-03	3.4082E-18	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.2720E-13	3.2436E-18	0.0000	0.0000	0.0000	8.3760
Bi-213	45.580	m	0.13	3.8241E-04	2.6196E-18	0.0831	0.4240	0.0000	0.1222
At-217	0.32300E-01	s	1.24	3.9198E-09	2.2735E-18	0.0002	0.0000	0.0000	7.0630
Ac-225	10.000	d	1.00	0.1047	2.2706E-18	0.0176	0.0000	0.0000	5.7880
Bi-210	5.0120	d	0.10	5.0990E-02	2.2059E-18	0.0004	0.3890	0.0000	4.6480
Fr-221	4.9000	m	4.08	2.7358E-05	1.7433E-18	0.0287	0.0000	0.0000	6.3590
Ra-225	14.800	d	1.35	0.1176	1.7228E-18	0.0137	0.0970	0.0000	0.0000
Pb-210	22.160	y	0.54	62.98	1.6870E-18	0.0045	0.0061	0.0000	0.0000
Pb-214	26.800	m	3.36	6.1484E-05	7.1630E-19	0.2513	0.2211	0.0000	0.0000
Pu-238	87.712	y	0.34	59.76	4.0448E-19	0.0018	0.0099	0.0000	5.4860
Po-210	138.40	d	0.00	0.2501	3.9181E-19	0.0000	0.0000	0.0000	5.3040
Bi-214	19.900	m	2.01	1.3547E-05	2.1255E-19	1.5100	0.6403	0.0000	0.0012
Rn-222	3.8230	d	0.01	2.7349E-03	1.5512E-19	0.0004	0.0000	0.0000	5.4890
Tl-209	2.2000	m	3.18	4.5736E-07	6.4910E-20	2.0300	0.6550	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84270E+08

Total number of decays = 1.42180E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 7.86755E-09
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40666E-08

Composite Exposure Rate Conversion Factor = 0.896252275 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491340 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718378 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.55975576E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	2.2142E+17	20.39	0.1740	0.1079	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	5.8680
Np-240	1.0830	h	4.62	1.7392E+14	0.8357	1.1900	0.2828	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.9439E+09	1.6641E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	6.2025E+08	6.3350E-06	0.0085	0.0000	6.3060
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	7.3699E+07	1.5033E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	1828.	9.0112E-10	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	0.1608	8.6043E-11	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	7.1950E-04	8.2339E-11	0.0002	0.0000	7.6870
Th-228	1.9130	y	0.03	2.1510E+08	6.6749E-11	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.7515E+14	4.8587E-11	0.0320	0.0000	4.7900
Th-234	24.090	d	0.12	7.6114E+05	6.8508E-12	0.0094	0.0478	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0001
Pa-231	32771.	y	0.34	4.6747E+10	8.4682E-13	0.0394	0.0000	4.9240
Pu-239	24111.	y	0.05	5.8766E+09	1.4469E-13	0.0001	0.0000	5.1000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pu-240	6563.1	y	0.08	2.4143E+08	2.1838E-14	0.0000	0.0000	5.1550
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	5.8900
Pa-234m	1.1700	m	2.56	1.9774E-03	5.2769E-16	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	4.4042E+07	3.4679E-16	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	3.0818E+06	2.4928E-16	0.0340	0.0000	4.9210
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	5.7959E-05	1.9458E-17	0.0006	0.0000	6.2880
Po-213	0.42000E-05	s	19.05	7.0414E-13	3.1408E-18	0.0000	0.0000	8.3760
Bi-213	45.580	m	0.13	3.5137E-04	2.4069E-18	0.0831	0.4240	0.0000
Pb-209	3.2530	h	0.43	1.4706E-03	2.3525E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	3.6111E-05	2.3010E-18	0.0287	0.0000	6.3590
Bi-210	5.0120	d	0.10	4.7427E-02	2.0518E-18	0.0004	0.3890	4.6480
At-217	0.32300E-01	s	1.24	3.1537E-09	1.8291E-18	0.0002	0.0000	7.0630
Ac-225	10.000	d	1.00	8.0094E-02	1.7366E-18	0.0176	0.0000	5.7880
Pb-210	22.160	y	0.54	51.53	1.3804E-18	0.0045	0.0061	0.0000
Pb-214	26.800	m	3.36	7.0381E-05	8.1997E-19	0.2513	0.2211	0.0000
Pu-238	87.712	y	0.34	93.21	6.3088E-19	0.0018	0.0099	5.4860
Ra-225	14.800	d	1.35	3.9921E-02	5.8485E-19	0.0137	0.0970	0.0000
Bi-214	19.900	m	2.01	2.2116E-05	3.4699E-19	1.5100	0.6403	0.0012
Po-218	3.0980	m	0.26	2.2493E-06	2.2669E-19	0.0000	0.0000	6.0010
Rn-222	3.8230	d	0.01	2.9928E-03	1.6974E-19	0.0004	0.0000	5.4890
Po-210	138.40	d	0.00	4.6582E-02	7.2978E-20	0.0000	0.0000	5.3040
Tl-209	2.2000	m	3.18	2.5188E-07	3.5748E-20	2.0300	0.6550	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84269E+08

Total number of decays = 2.21766E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 1.22714E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40667E-08

Composite Exposure Rate Conversion Factor = 0.896252275 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491340 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718438 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.94798186E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	2.7654E+17	25.46	0.1740	0.1079	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	5.8680
Np-240	1.0830	h	4.62	2.1720E+14	1.044	1.1900	0.2828	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.9439E+09	1.6640E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	7.7463E+08	7.9118E-06	0.0085	0.0000	6.3060
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	9.2042E+07	1.8774E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	2851.	1.4055E-09	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	0.3075	1.6457E-10	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	1.3885E-03	1.5890E-10	0.0002	0.0000	7.6870
Th-228	1.9130	y	0.03	2.6864E+08	8.3363E-11	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.1875E+14	6.0681E-11	0.0320	0.0000	4.7900
Th-234	24.090	d	0.12	9.5059E+05	8.5559E-12	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	5.8382E+10	1.0576E-12	0.0394	0.0000	4.9240
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0001
Pu-239	24111.	y	0.05	9.1734E+09	2.2587E-13	0.0001	0.0000	5.1000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pu-240	6563.1	y	0.08	3.7624E+08	3.4031E-14	0.0000	0.0000	5.1550
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	5.8900
Pa-234m	1.1700	m	2.56	3.0836E-03	8.2290E-16	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	5.6625E+07	4.4587E-16	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	3.8498E+06	3.1140E-16	0.0340	0.0000	4.9210
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	3.1381E-05	1.0535E-17	0.0006	0.0000	6.2880
Po-213	0.42000E-05	s	19.05	7.9370E-13	3.5402E-18	0.0000	0.0000	8.3760
Tl-208	3.0530	m	0.13	2.9547E-05	3.0218E-18	3.3800	0.5598	0.0000
Fr-221	4.9000	m	4.08	4.1403E-05	2.6382E-18	0.0287	0.0000	6.3590
Pb-209	3.2530	h	0.43	1.5414E-03	2.4657E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	3.2256E-04	2.2096E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	2.8759E-09	1.6680E-18	0.0002	0.0000	7.0630
Ac-225	10.000	d	1.00	6.4339E-02	1.3950E-18	0.0176	0.0000	5.7880
Pb-210	22.160	y	0.54	51.90	1.3904E-18	0.0045	0.0061	0.0000
Bi-210	5.0120	d	0.10	3.2030E-02	1.3857E-18	0.0004	0.3890	0.0000
Ra-225	14.800	d	1.35	5.9707E-02	8.7473E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	7.1238E-05	8.2994E-19	0.2513	0.2211	0.0000
Pu-238	87.712	y	0.34	116.4	7.8791E-19	0.0018	0.0099	5.4860
Po-218	3.0980	m	0.26	3.3039E-06	3.3298E-19	0.0000	0.0000	6.0010
Po-210	138.40	d	0.00	0.1780	2.7888E-19	0.0000	0.0000	5.3040
Bi-214	19.900	m	2.01	1.5123E-05	2.3728E-19	1.5100	0.6403	0.0000
Rn-222	3.8230	d	0.01	3.1671E-03	1.7963E-19	0.0004	0.0000	5.4890

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84268E+08

Total number of decays = 2.76964E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 1.53258E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40667E-08

Composite Exposure Rate Conversion Factor = 0.896252334 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491340 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718438 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.43283808E-02 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8366E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
Np-239	2.3550	d	0.17	3.4536E+17	31.80	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	2.7124E+14	1.303	1.1900	0.2828	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.9439E+09	1.6640E-04	0.3148	0.6243	0.0000	0.0000
Th-226	30.570	m	0.33	9.6744E+08	9.8810E-06	0.0085	0.0000	0.0000	6.3060
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-231	1.0630	d	0.04	1.1495E+08	2.3447E-08	0.0225	0.0794	0.0000	0.0000
Ra-222	38.000	s	1.32	4447.	2.1921E-09	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	0.5856	3.1345E-10	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	2.6636E-03	3.0482E-10	0.0002	0.0000	0.0000	7.6870
Th-228	1.9130	y	0.03	3.3550E+08	1.0411E-10	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.7319E+14	7.5784E-11	0.0320	0.0000	0.0000	4.7900
Th-234	24.090	d	0.12	1.1872E+06	1.0685E-11	0.0094	0.0478	0.0000	0.0000
Pa-231	32771.	y	0.34	7.2913E+10	1.3208E-12	0.0394	0.0000	0.0000	4.9240
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pu-239	24111.	y	0.05	1.4303E+10	3.5217E-13	0.0001	0.0000	0.0000	5.1000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.8695E+08	5.3091E-14	0.0000	0.0000	0.0000	5.1550
Pa-234m	1.1700	m	2.56	4.8094E-03	1.2834E-15	0.0160	0.8101	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Th-230	75392.	y	0.40	6.9208E+07	5.4495E-16	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	4.8101E+06	3.8908E-16	0.0340	0.0000	0.0000	4.9210
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.2072E-13	3.2147E-18	0.0000	0.0000	0.0000	8.3760
Bi-213	45.580	m	0.13	4.2998E-04	2.9454E-18	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	1.7467E-03	2.7943E-18	0.0001	0.1975	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.5554E-05	2.2655E-18	0.0287	0.0000	0.0000	6.3590
Bi-210	5.0120	d	0.10	5.1853E-02	2.2432E-18	0.0004	0.3890	0.0000	4.6480
Ac-225	10.000	d	1.00	0.1030	2.2323E-18	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	3.3734E-09	1.9565E-18	0.0002	0.0000	0.0000	7.0630
Ra-225	14.800	d	1.35	0.1269	1.8594E-18	0.0137	0.0970	0.0000	0.0000
Pb-210	22.160	y	0.54	68.37	1.8316E-18	0.0045	0.0061	0.0000	0.0000
Pu-238	87.712	y	0.34	145.4	9.8403E-19	0.0018	0.0099	0.0000	5.4860
Pb-214	26.800	m	3.36	5.7020E-05	6.6430E-19	0.2513	0.2211	0.0000	0.0000
Pa-233	27.000	d	0.37	6.2501E-02	5.0192E-19	0.2175	0.0664	0.0000	0.0000
Bi-214	19.900	m	2.01	2.3554E-05	3.6956E-19	1.5100	0.6403	0.0000	0.0012
Po-218	3.0980	m	0.26	2.4722E-06	2.4916E-19	0.0000	0.0000	0.0000	6.0010
Po-210	138.40	d	0.00	0.1236	1.9363E-19	0.0000	0.0000	0.0000	5.3040
Rn-222	3.8230	d	0.01	3.3868E-03	1.9209E-19	0.0004	0.0000	0.0000	5.4890
Tl-209	2.2000	m	3.18	2.7652E-07	3.9244E-20	2.0300	0.6550	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84267E+08

Total number of decays = 3.45900E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 1.91404E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40668E-08

Composite Exposure Rate Conversion Factor = 0.896252275 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491340 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718438 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.03837620E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8840E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	4.3132E+17	39.71	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	3.3874E+14	1.628	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9438E+09	1.6640E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	1.2082E+09	1.2340E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	1.4356E+08	2.9283E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	6935.	3.4190E-09	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.110	5.9391E-10	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	5.0759E-03	5.8088E-10	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	4.1901E+08	1.3002E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	3.4119E+14	9.4646E-11	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.4827E+06	1.3345E-11	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	9.1061E+10	1.6496E-12	0.0394	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	2.2319E+10	5.4953E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pu-240	6563.1	y	0.08	9.1538E+08	8.2798E-14	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	7.5012E-03	2.0018E-15	0.0160	0.8101	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Th-230	75392.	y	0.40	9.0179E+07	7.1009E-16	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	5.9900E+06	4.8452E-16	0.0340	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Po-218	3.0980	m	0.26	1.9192E-04	1.9343E-17	0.0000	0.0000	0.0000
Rn-222	3.8230	d	0.01	0.1737	9.8500E-18	0.0004	0.0000	0.0000
Bi-210	5.0120	d	0.10	0.1298	5.6146E-18	0.0004	0.3890	0.0000
Pb-209	3.2530	h	0.43	1.8488E-03	2.9575E-18	0.0001	0.1975	0.0000
Po-213	0.42000E-05	s	19.05	6.4985E-13	2.8986E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1165E-04	2.8199E-18	0.0831	0.4240	0.0000
Fr-221	4.9000	m	4.08	3.3747E-05	2.1504E-18	0.0287	0.0000	0.0000
Pb-210	22.160	y	0.54	56.20	1.5055E-18	0.0045	0.0061	0.0000
At-217	0.32300E-01	s	1.24	2.5842E-09	1.4988E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	6.2121E-02	1.3469E-18	0.0176	0.0000	0.0000
Pu-238	87.712	y	0.34	181.6	1.2290E-18	0.0018	0.0099	0.0000
Pa-233	27.000	d	0.37	6.2502E-02	5.0192E-19	0.2175	0.0664	0.0000
Pb-214	26.800	m	3.36	2.7825E-05	3.2417E-19	0.2513	0.2211	0.0000
Ra-225	14.800	d	1.35	1.7362E-02	2.5436E-19	0.0137	0.0970	0.0000
Tl-209	2.2000	m	3.18	3.0919E-07	4.3880E-20	2.0300	0.6550	0.0000
Bi-214	19.900	m	2.01	1.6917E-06	2.6542E-20	1.5100	0.6403	0.0000
Ra-223	11.430	d	0.17	7.7627E-04	1.4726E-20	0.1351	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 3.84266E+08

Total number of decays = 4.31995E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 2.39045E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40669E-08

Composite Exposure Rate Conversion Factor = 0.896252394 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491519 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718497 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.79463360E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8839E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	5.3868E+17	49.60	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	4.2304E+14	2.033	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9438E+09	1.6640E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	1.5090E+09	1.5412E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	1.7930E+08	3.6572E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	1.0817E+04	5.3326E-09	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.089	1.1184E-09	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.6023E-03	1.0989E-09	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	5.2330E+08	1.6239E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	4.2611E+14	1.1820E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.8517E+06	1.6667E-11	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	1.1373E+11	2.0602E-12	0.0394	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	3.4814E+10	8.5718E-13	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.4275E+09	1.2912E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	1.1699E-02	3.1221E-15	0.0160	0.8101	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Th-230	75392.	y	0.40	1.1115E+08	8.7522E-16	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	7.4863E+06	6.0555E-16	0.0340	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pb-212	10.640	h	0.09	8.3454E-02	4.0816E-17	0.1437	0.0998	0.0000
Tl-208	3.0530	m	0.13	1.4826E-04	1.5162E-17	3.3800	0.5598	0.0000
Po-213	0.42000E-05	s	19.05	8.6701E-13	3.8672E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.8289E-03	2.9257E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	3.4318E-04	2.3508E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	3.9329E-09	2.2810E-18	0.0002	0.0000	0.0000
Rn-220	55.800	s	0.54	6.7496E-06	2.2660E-18	0.0006	0.0000	0.0000
Ac-225	10.000	d	1.00	8.9208E-02	1.9343E-18	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	2.7131E-05	1.7288E-18	0.0287	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.7051E-02	1.6029E-18	0.0004	0.3890	0.0000
Pu-238	87.712	y	0.34	226.8	1.5348E-18	0.0018	0.0099	0.0000
Pb-210	22.160	y	0.54	49.71	1.3315E-18	0.0045	0.0061	0.0000
Pb-214	26.800	m	3.36	7.5286E-05	8.7710E-19	0.2513	0.2211	0.0000
Pa-233	27.000	d	0.37	6.2502E-02	5.0193E-19	0.2175	0.0664	0.0000
Ra-225	14.800	d	1.35	2.2379E-02	3.2786E-19	0.0137	0.0970	0.0000
Rn-222	3.8230	d	0.01	4.0029E-03	2.2703E-19	0.0004	0.0000	0.0000
Po-218	3.0980	m	0.26	1.8643E-06	1.8790E-19	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84265E+08

Total number of decays = 5.39518E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 2.98543E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40671E-08

Composite Exposure Rate Conversion Factor = 0.896252394 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491579 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718557 Rem/hr per Ci/m2

Actinide Source

Point in time = 4.73912507E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8839E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	6.7275E+17	61.94	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	5.2832E+14	2.539	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9437E+09	1.6640E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	1.8845E+09	1.9248E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	2.2392E+08	4.5675E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	1.6871E+04	8.3170E-09	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	3.906	2.0904E-09	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.8014E-02	2.0616E-09	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	6.5355E+08	2.0281E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	5.3217E+14	1.4762E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	2.3126E+06	2.0815E-11	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	1.4203E+11	2.5729E-12	0.0394	0.0000	0.0000
Pu-239	24111.	y	0.05	5.4301E+10	1.3370E-12	0.0001	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.2261E+09	2.0136E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	1.8247E-02	4.8695E-15	0.0160	0.8101	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Th-230	75392.	y	0.40	1.3632E+08	1.0734E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	9.3508E+06	7.5636E-16	0.0340	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Po-213	0.42000E-05	s	19.05	9.4185E-13	4.2011E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.8314E-03	2.9298E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	4.2758E-04	2.9290E-18	0.0831	0.4240	0.0000
Rn-220	55.800	s	0.54	6.7892E-06	2.2793E-18	0.0006	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.4647E-05	2.2077E-18	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	3.6220E-09	2.1008E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	9.0109E-02	1.9538E-18	0.0176	0.0000	0.0000
Pu-238	87.712	y	0.34	283.2	1.9169E-18	0.0018	0.0099	0.0000
Bi-210	5.0120	d	0.10	3.9570E-02	1.7119E-18	0.0004	0.3890	0.0000
Pb-210	22.160	y	0.54	62.61	1.6773E-18	0.0045	0.0061	0.0000
Pa-233	27.000	d	0.37	0.1250	1.0038E-18	0.2175	0.0664	0.0000
Ra-225	14.800	d	1.35	6.3990E-02	9.3747E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	6.2114E-05	7.2365E-19	0.2513	0.2211	0.0000
Bi-214	19.900	m	2.01	1.9682E-05	3.0881E-19	1.5100	0.6403	0.0000
Po-218	3.0980	m	0.26	2.1036E-06	2.1201E-19	0.0000	0.0000	0.0000
Po-210	138.40	d	0.00	9.9419E-02	1.5575E-19	0.0000	0.0000	0.0000
Tl-209	2.2000	m	3.18	3.3604E-07	4.7691E-20	2.0300	0.6550	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84263E+08

Total number of decays = 6.73804E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 3.72850E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40673E-08

Composite Exposure Rate Conversion Factor = 0.896252513 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491638 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718616 Rem/hr per Ci/m2

Actinide Source

Point in time = 5.91870211E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8839E+22	3.8366E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-239	2.3550	d	0.17	8.4020E+17	77.36	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	6.5981E+14	3.170	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9436E+09	1.6639E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	2.3536E+09	2.4039E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	2.7966E+08	5.7043E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	2.6312E+04	1.2972E-08	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	7.237	3.8734E-09	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	3.3478E-02	3.8312E-09	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	8.1621E+08	2.5328E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	6.6463E+14	1.8437E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	2.8882E+06	2.5996E-11	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	1.7738E+11	3.2133E-12	0.0394	0.0000	0.0000
Pu-239	24111.	y	0.05	8.4701E+10	2.0855E-12	0.0001	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.4722E+09	3.1406E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	2.8460E-02	7.5948E-15	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	1.6987E+08	1.3376E-15	0.0004	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Th-229	7339.2	y	2.18	1.1679E+07	9.4470E-16	0.0340	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	6.5224E-05	2.1897E-17	0.0006	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.9275E-13	3.5360E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.0165E-03	3.2259E-18	0.0001	0.1975	0.0000
At-217	0.32300E-01	s	1.24	5.1847E-09	3.0071E-18	0.0002	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1036E-04	2.8110E-18	0.0831	0.4240	0.0000
Pu-238	87.712	y	0.34	353.7	2.3940E-18	0.0018	0.0099	0.0000
Fr-221	4.9000	m	4.08	3.5193E-05	2.2425E-18	0.0287	0.0000	0.0000
Pa-233	27.000	d	0.37	0.2500	2.0077E-18	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	4.4187E-02	1.9116E-18	0.0004	0.3890	0.0000
Ac-225	10.000	d	1.00	8.7629E-02	1.9000E-18	0.0176	0.0000	0.0000
Pb-210	22.160	y	0.54	51.77	1.3869E-18	0.0045	0.0061	0.0000
Ra-225	14.800	d	1.35	8.2365E-02	1.2067E-18	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	7.2346E-05	8.4285E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	4.3159E-06	4.3498E-19	0.0000	0.0000	0.0000
Bi-214	19.900	m	2.01	2.1627E-05	3.3932E-19	1.5100	0.6403	0.0000
Rn-222	3.8230	d	0.01	3.0096E-03	1.7069E-19	0.0004	0.0000	0.0000
Po-210	138.40	d	0.00	5.6545E-02	8.8587E-20	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84261E+08

Total number of decays = 8.41513E+17
Asympt number of decays = 1.80717E+27
Percent of decays = 4.65651E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40675E-08

Composite Exposure Rate Conversion Factor = 0.896252692 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491757 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718736 Rem/hr per Ci/m2

Actinide Source

Point in time = 7.39187896E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8839E+22	3.8365E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.0493E+18	96.61	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	8.2402E+14	3.959	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9435E+09	1.6639E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	2.9394E+09	3.0022E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	3.4926E+08	7.1241E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	4.1036E+04	2.0231E-08	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	13.27	7.1049E-09	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	6.1551E-02	7.0438E-09	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	1.0194E+09	3.1633E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	8.3005E+14	2.3026E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	3.6071E+06	3.2466E-11	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	2.2153E+11	4.0131E-12	0.0394	0.0000	0.0000
Pu-239	24111.	y	0.05	1.3211E+11	3.2529E-12	0.0001	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.4153E+09	4.8982E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	4.4387E-02	1.1845E-14	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	2.1391E+08	1.6844E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.4575E+07	1.1790E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-213	45.580	m	0.13	4.7901E-04	3.2813E-18	0.0831	0.4240	0.0000
Pu-238	87.712	y	0.34	441.8	2.9898E-18	0.0018	0.0099	0.0000
Pb-209	3.2530	h	0.43	1.7626E-03	2.8196E-18	0.0001	0.1975	0.0000
Bi-210	5.0120	d	0.10	6.1827E-02	2.6747E-18	0.0004	0.3890	0.0000
Po-213	0.42000E-05	s	19.05	5.9123E-13	2.6371E-18	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	0.3125	2.5096E-18	0.2175	0.0664	0.0000
Ac-225	10.000	d	1.00	7.9395E-02	1.7215E-18	0.0176	0.0000	0.0000
Pb-210	22.160	y	0.54	61.20	1.6396E-18	0.0045	0.0061	0.0000
At-217	0.32300E-01	s	1.24	2.3496E-09	1.3628E-18	0.0002	0.0000	0.0000
Ra-225	14.800	d	1.35	8.0598E-02	1.1808E-18	0.0137	0.0970	0.0000
Fr-221	4.9000	m	4.08	1.6165E-05	1.0300E-18	0.0287	0.0000	0.0000
Pb-214	26.800	m	3.36	6.7972E-05	7.9189E-19	0.2513	0.2211	0.0000
Po-210	138.40	d	0.00	0.2061	3.2282E-19	0.0000	0.0000	0.0000
Rn-222	3.8230	d	0.01	5.6313E-03	3.1939E-19	0.0004	0.0000	0.0000
Po-218	3.0980	m	0.26	2.7828E-06	2.8047E-19	0.0000	0.0000	0.0000
Bi-214	19.900	m	2.01	1.6404E-05	2.5738E-19	1.5100	0.6403	0.0000
Ra-223	11.430	d	0.17	4.8549E-03	9.2096E-20	0.1351	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84258E+08

Total number of decays = 1.05096E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 5.81551E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40677E-08

Composite Exposure Rate Conversion Factor = 0.896252871 R/hr per Ci/m2
Composite ECF per FGR table = 0.980491936 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718855 Rem/hr per Ci/m2

Actinide Source

Point in time = 9.23173055E-02 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8839E+22	3.8365E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.3105E+18	120.7	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	1.0291E+15	4.945	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9434E+09	1.6639E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	3.6710E+09	3.7494E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	4.3620E+08	8.8973E-08	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	6.3999E+04	3.1551E-08	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	24.07	1.2883E-08	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	0.1118	1.2796E-08	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	1.2731E+09	3.9506E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.0367E+15	2.8757E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	4.5049E+06	4.0547E-11	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	2.0606E+11	5.0736E-12	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	2.7667E+11	5.0120E-12	0.0394	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.4464E+09	7.6399E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	6.9229E-02	1.8475E-14	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	2.6634E+08	2.0972E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.8192E+07	1.4715E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.066	6.3525E-17	0.0104	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Tl-208	3.0530	m	0.13	8.2370E-05	8.4239E-18	3.3800	0.5598	0.0000
Bi-210	5.0120	d	0.10	9.9399E-02	4.3001E-18	0.0004	0.3890	0.0000
Pu-238	87.712	y	0.34	551.7	3.7340E-18	0.0018	0.0099	0.0000
Pa-233	27.000	d	0.37	0.4375	3.5134E-18	0.2175	0.0664	0.0000
Bi-213	45.580	m	0.13	4.7854E-04	3.2780E-18	0.0831	0.4240	0.0000
Po-213	0.42000E-05	s	19.05	6.8191E-13	3.0416E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.7359E-03	2.7769E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	4.2505E-05	2.7084E-18	0.0287	0.0000	0.0000
Ac-225	10.000	d	1.00	0.1074	2.3281E-18	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	3.4708E-09	2.0130E-18	0.0002	0.0000	0.0000
Ra-225	14.800	d	1.35	8.7950E-02	1.2885E-18	0.0137	0.0970	0.0000
Pb-210	22.160	y	0.54	42.97	1.1511E-18	0.0045	0.0061	0.0000
Pb-214	26.800	m	3.36	4.1502E-05	4.8351E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	2.2972E-06	2.3152E-19	0.0000	0.0000	0.0000
Bi-214	19.900	m	2.01	1.1755E-05	1.8444E-19	1.5100	0.6403	0.0000
Rn-222	3.8230	d	0.01	2.5598E-03	1.4518E-19	0.0004	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84255E+08

Total number of decays = 1.31254E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 7.26296E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40681E-08

Composite Exposure Rate Conversion Factor = 0.896252930 R/hr per Ci/m2
Composite ECF per FGR table = 0.980492055 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651718855 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.115295239 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8838E+22	3.8365E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.6367E+18	150.7	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	1.2852E+15	6.176	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9433E+09	1.6638E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	4.5847E+09	4.6826E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	5.4477E+08	1.1112E-07	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	9.9809E+04	4.9205E-08	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	43.08	2.3060E-08	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	0.2004	2.2938E-08	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	1.5900E+09	4.9339E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.2947E+15	3.5914E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	5.6262E+06	5.0639E-11	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	3.2141E+11	7.9138E-12	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	3.4554E+11	6.2595E-12	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.3173E+10	1.1916E-12	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	0.1080	2.8814E-14	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	3.3555E+08	2.6422E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.2725E+07	1.8382E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
U-235m	26.000	m	7.69	6.8361E-03	8.2093E-17	0.0000	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-210	5.0120	d	0.10	0.1731	7.4876E-18	0.0004	0.3890	0.0000
Pa-233	27.000	d	0.37	0.7500	6.0230E-18	0.2175	0.0664	0.0000
Pu-238	87.712	y	0.34	689.0	4.6634E-18	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	7.5582E-13	3.3713E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.6833E-03	2.6927E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	3.7618E-04	2.5769E-18	0.0831	0.4240	0.0000
Bi-214	19.900	m	2.01	1.6027E-04	2.5146E-18	1.5100	0.6403	0.0000
Fr-221	4.9000	m	4.08	3.2801E-05	2.0901E-18	0.0287	0.0000	0.0000
Pb-210	22.160	y	0.54	77.26	2.0696E-18	0.0045	0.0061	0.0000
At-217	0.32300E-01	s	1.24	3.3468E-09	1.9411E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	8.0787E-02	1.7517E-18	0.0176	0.0000	0.0000
Ra-225	14.800	d	1.35	5.7848E-02	8.4750E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	6.9450E-05	8.0911E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	9.7649E-07	9.8415E-20	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	5.1756E-03	9.8180E-20	0.1351	0.0000	0.0000
Rn-222	3.8230	d	0.01	1.6492E-03	9.3536E-20	0.0004	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84250E+08

Total number of decays = 1.63923E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 9.07068E-08
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40685E-08

Composite Exposure Rate Conversion Factor = 0.896253109 R/hr per Ci/m2
Composite ECF per FGR table = 0.980492353 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651719093 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.143992454 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8838E+22	3.8364E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	2.0440E+18	188.2	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	1.6051E+15	7.713	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9431E+09	1.6637E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	5.7258E+09	5.8481E-05	0.0085	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-231	1.0630	d	0.04	6.8036E+08	1.3878E-07	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	1.5565E+05	7.6734E-08	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	76.05	4.0705E-08	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	0.3542	4.0537E-08	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	1.9857E+09	6.1620E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.6169E+15	4.4853E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	7.0266E+06	6.3244E-11	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	5.0132E+11	1.2343E-11	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	4.3154E+11	7.8175E-12	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.0547E+10	1.8585E-12	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	0.1684	4.4938E-14	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	4.1524E+08	3.2697E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.8389E+07	2.2964E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
U-235m	26.000	m	7.69	7.8127E-03	9.3821E-17	0.0000	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	1.0053E-04	3.3752E-17	0.0006	0.0000	0.0000
Ra-224	3.6400	d	0.82	0.2110	1.2567E-17	0.0104	0.0000	0.0000
Pa-233	27.000	d	0.37	1.125	9.0345E-18	0.2175	0.0664	0.0000
Pu-238	87.712	y	0.34	860.5	5.8242E-18	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	8.2529E-13	3.6811E-18	0.0000	0.0000	0.0000
Pb-210	22.160	y	0.54	112.0	3.0003E-18	0.0045	0.0061	0.0000
Fr-221	4.9000	m	4.08	4.6228E-05	2.9456E-18	0.0287	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.7025E-03	2.7235E-18	0.0001	0.1975	0.0000
Rn-222	3.8230	d	0.01	4.6055E-02	2.6121E-18	0.0004	0.0000	0.0000
Bi-213	45.580	m	0.13	3.8126E-04	2.6117E-18	0.0831	0.4240	0.0000
Ac-225	10.000	d	1.00	9.3423E-02	2.0256E-18	0.0176	0.0000	0.0000
Bi-210	5.0120	d	0.10	4.3432E-02	1.8789E-18	0.0004	0.3890	0.0000
Ra-225	14.800	d	1.35	0.1253	1.8353E-18	0.0137	0.0970	0.0000
At-217	0.32300E-01	s	1.24	2.5034E-09	1.4520E-18	0.0002	0.0000	0.0000
Pb-214	26.800	m	3.36	4.5286E-05	5.2759E-19	0.2513	0.2211	0.0000
Bi-214	19.900	m	2.01	1.2607E-05	1.9780E-19	1.5100	0.6403	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84245E+08

Total number of decays = 2.04722E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 1.13283E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21375E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40690E-08

Composite Exposure Rate Conversion Factor = 0.896253407 R/hr per Ci/m2
Composite ECF per FGR table = 0.980492651 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651719332 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.179832458 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8837E+22	3.8363E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	2.5527E+18	235.0	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	2.0046E+15	9.632	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9429E+09	1.6636E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	7.1509E+09	7.3036E-05	0.0085	0.0000	0.0000
Th-231	1.0630	d	0.04	8.4970E+08	1.7332E-07	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Ra-222	38.000	s	1.32	2.4272E+05	1.1966E-07	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	132.3	7.0807E-08	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	0.6167	7.0579E-08	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	2.4800E+09	7.6957E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.0194E+15	5.6017E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	8.7755E+06	7.8985E-11	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	7.8193E+11	1.9253E-11	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	5.3896E+11	9.7633E-12	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.2047E+10	2.8987E-12	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Pa-234m	1.1700	m	2.56	0.2626	7.0083E-14	0.0160	0.8101	0.0000
Th-230	75392.	y	0.40	5.2010E+08	4.0953E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	3.5438E+07	2.8665E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
U-235m	26.000	m	7.69	3.4180E-02	4.1046E-16	0.0000	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.324	7.8883E-17	0.0104	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pa-233	27.000	d	0.37	1.875	1.5057E-17	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	0.2715	1.1745E-17	0.0004	0.3890	0.0000
Pu-238	87.712	y	0.34	1075.	7.2738E-18	0.0018	0.0099	0.0000
Pb-210	22.160	y	0.54	195.5	5.2368E-18	0.0045	0.0061	0.0000
Po-213	0.42000E-05	s	19.05	7.9579E-13	3.5496E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.6664E-04	3.1965E-18	0.0831	0.4240	0.0000
Pb-209	3.2530	h	0.43	1.7280E-03	2.7643E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	3.0958E-05	1.9727E-18	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	2.9887E-09	1.7334E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	7.3544E-02	1.5946E-18	0.0176	0.0000	0.0000
Pb-214	26.800	m	3.36	6.8428E-05	7.9721E-19	0.2513	0.2211	0.0000
Ra-225	14.800	d	1.35	5.0239E-02	7.3601E-19	0.0137	0.0970	0.0000
Rn-222	3.8230	d	0.01	8.7088E-03	4.9393E-19	0.0004	0.0000	0.0000
Bi-214	19.900	m	2.01	1.8484E-05	2.9001E-19	1.5100	0.6403	0.0000
Po-210	138.40	d	0.00	0.1321	2.0698E-19	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84238E+08

Total number of decays = 2.55676E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 1.41478E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21376E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40697E-08

Composite Exposure Rate Conversion Factor = 0.896253765 R/hr per Ci/m2
Composite ECF per FGR table = 0.980493128 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651719630 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.224593058 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8837E+22	3.8362E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	3.1881E+18	293.5	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	2.5035E+15	12.03	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9426E+09	1.6635E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	8.9307E+09	9.1214E-05	0.0085	0.0000	0.0000
Th-231	1.0630	d	0.04	1.0612E+09	2.1646E-07	0.0225	0.0794	0.0000
Ra-222	38.000	s	1.32	3.7848E+05	1.8659E-07	0.0092	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Rn-218	0.35000E-01	s	25.71	226.7	1.2135E-07	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.058	1.2105E-07	0.0002	0.0000	0.0000
Th-228	1.9130	y	0.03	3.0972E+09	9.6112E-10	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.5220E+15	6.9960E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.0960E+07	9.8644E-11	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	1.2196E+12	3.0029E-11	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	6.7310E+11	1.2193E-11	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	4.9985E+10	4.5212E-12	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-234m	1.1700	m	2.56	0.4096	1.0930E-13	0.0160	0.8101	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	6.4802E+08	5.1026E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	4.4256E+07	3.5797E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
U-235m	26.000	m	7.69	7.8126E-02	9.3819E-16	0.0000	0.0000	0.0000
Ra-224	3.6400	d	0.82	2.699	1.6079E-16	0.0104	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	1.0084E-04	3.3856E-17	0.0006	0.0000	0.0000
Pu-233	27.000	d	0.37	2.875	2.3088E-17	0.2175	0.0664	0.0000
Pu-238	87.712	y	0.34	1342.	9.0843E-18	0.0018	0.0099	0.0000
Pb-210	22.160	y	0.54	335.8	8.9969E-18	0.0045	0.0061	0.0000
Bi-210	5.0120	d	0.10	6.6174E-02	2.8628E-18	0.0004	0.3890	0.0000
Bi-213	45.580	m	0.13	3.6081E-04	2.4716E-18	0.0831	0.4240	0.0000
Po-213	0.42000E-05	s	19.05	4.4634E-13	1.9908E-18	0.0000	0.0000	0.0000
Ac-225	10.000	d	1.00	7.5707E-02	1.6415E-18	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	2.6017E-09	1.5090E-18	0.0002	0.0000	0.0000
Pb-209	3.2530	h	0.43	8.5550E-04	1.3685E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	2.0356E-05	1.2971E-18	0.0287	0.0000	0.0000
Ra-225	14.800	d	1.35	7.0601E-02	1.0343E-18	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	5.5412E-05	6.4556E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	2.8098E-06	2.8318E-19	0.0000	0.0000	0.0000
Bi-214	19.900	m	2.01	1.0544E-05	1.6543E-19	1.5100	0.6403	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84230E+08

Total number of decays = 3.19310E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 1.76690E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21376E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40705E-08

Composite Exposure Rate Conversion Factor = 0.896254182 R/hr per Ci/m2
Composite ECF per FGR table = 0.980493605 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651719987 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.280494660 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8836E+22	3.8361E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	3.9815E+18	366.6	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	3.1266E+15	15.02	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9423E+09	1.6634E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	1.1153E+10	1.1392E-04	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	5.9013E+05	2.9093E-07	0.0092	0.0000	0.0000
Th-231	1.0630	d	0.04	1.3253E+09	2.7033E-07	0.0225	0.0794	0.0000
Rn-218	0.35000E-01	s	25.71	383.0	2.0501E-07	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.788	2.0461E-07	0.0002	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	3.8681E+09	1.2003E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	3.1497E+15	8.7373E-10	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.3688E+07	1.2320E-10	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	1.9023E+12	4.6838E-11	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	8.4064E+11	1.5228E-11	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	7.7962E+10	7.0518E-12	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-234m	1.1700	m	2.56	0.6387	1.7044E-13	0.0160	0.8101	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	8.1160E+08	6.3907E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	5.5277E+07	4.4713E-15	0.0340	0.0000	0.0000
U-235m	26.000	m	7.69	0.1543	1.8529E-15	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Ra-224	3.6400	d	0.82	5.430	3.2343E-16	0.0104	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pa-233	27.000	d	0.37	4.500	3.6138E-17	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	5.8757E-05	1.9726E-17	0.0006	0.0000	0.0000
Pb-210	22.160	y	0.54	657.3	1.7607E-17	0.0045	0.0061	0.0000
Pu-238	87.712	y	0.34	1676.	1.1345E-17	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	5.8102E-13	2.5916E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.3771E-03	2.2029E-18	0.0001	0.1975	0.0000
Ac-225	10.000	d	1.00	9.9644E-02	2.1605E-18	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.2689E-05	2.0829E-18	0.0287	0.0000	0.0000
Bi-213	45.580	m	0.13	2.6943E-04	1.8456E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	2.9016E-09	1.6829E-18	0.0002	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.6023E-02	1.5584E-18	0.0004	0.3890	0.0000
Ra-225	14.800	d	1.35	5.6993E-02	8.3497E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	6.0126E-05	7.0049E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	3.2816E-06	3.3073E-19	0.0000	0.0000	0.0000
Rn-222	3.8230	d	0.01	5.2272E-03	2.9647E-19	0.0004	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021071D+26

Total number of nuclides = 83
Total activity (Ci) = 3.84219E+08

Total number of decays = 3.98782E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 2.20666E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21376E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40716E-08

Composite Exposure Rate Conversion Factor = 0.896254718 R/hr per Ci/m2
Composite ECF per FGR table = 0.980494261 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651720405 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.350310326 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8835E+22	3.8360E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	4.9725E+18	457.8	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	3.9048E+15	18.76	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9418E+09	1.6632E-04	0.3148	0.6243	0.0000
Th-226	30.570	m	0.33	1.3929E+10	1.4227E-04	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	9.2007E+05	4.5359E-07	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	638.5	3.4173E-07	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2.982	3.4121E-07	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	1.6552E+09	3.3762E-07	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	4.8309E+09	1.4991E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	3.9337E+15	1.0912E-09	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.7094E+07	1.5386E-10	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	2.9671E+12	7.3055E-11	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	1.0499E+12	1.9019E-11	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.2160E+11	1.0999E-11	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-234m	1.1700	m	2.56	0.9960	2.6579E-13	0.0160	0.8101	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	1.0108E+09	7.9595E-15	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	6.9031E+07	5.5838E-15	0.0340	0.0000	0.0000
U-235m	26.000	m	7.69	0.3115	3.7410E-15	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Ra-224	3.6400	d	0.82	8.992	5.3564E-16	0.0104	0.0000	0.0000
Pa-233	27.000	d	0.37	7.063	5.6716E-17	0.2175	0.0664	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pb-210	22.160	y	0.54	1372.	3.6756E-17	0.0045	0.0061	0.0000
Pu-238	87.712	y	0.34	2094.	1.4169E-17	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	7.1156E-13	3.1738E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.2474E-04	2.9095E-18	0.0831	0.4240	0.0000
Bi-210	5.0120	d	0.10	6.2162E-02	2.6892E-18	0.0004	0.3890	0.0000
Pb-209	3.2530	h	0.43	1.4236E-03	2.2773E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	2.9531E-05	1.8817E-18	0.0287	0.0000	0.0000
Ra-225	14.800	d	1.35	0.1079	1.5813E-18	0.0137	0.0970	0.0000
Ac-225	10.000	d	1.00	5.7220E-02	1.2407E-18	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	1.0860E-09	6.2987E-19	0.0002	0.0000	0.0000
Pb-214	26.800	m	3.36	3.7354E-05	4.3519E-19	0.2513	0.2211	0.0000
Po-218	3.0980	m	0.26	3.1550E-06	3.1797E-19	0.0000	0.0000	0.0000
Bi-214	19.900	m	2.01	8.2310E-06	1.2914E-19	1.5100	0.6403	0.0000
Ra-223	11.430	d	0.17	4.1330E-03	7.8403E-20	0.1351	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84206E+08

Total number of decays = 4.98031E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 2.75586E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21377E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40729E-08

Composite Exposure Rate Conversion Factor = 0.896255195 R/hr per Ci/m2
Composite ECF per FGR table = 0.980494916 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651720822 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.437503278 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8834E+22	3.8358E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1630E+20	3.0127E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	6.2100E+18	571.8	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	4.8767E+15	23.43	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-226	30.570	m	0.33	1.7396E+10	1.7768E-04	0.0085	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9413E+09	1.6630E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	1.4343E+06	7.0710E-07	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1052.	5.6285E-07	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	4.912	5.6218E-07	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	2.0672E+09	4.2165E-07	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	6.0333E+09	1.8722E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	4.9128E+15	1.3628E-09	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	2.1349E+07	1.9216E-10	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	4.6278E+12	1.1395E-10	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	1.3112E+12	2.3753E-11	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.8966E+11	1.7155E-11	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.553	4.1445E-13	0.0160	0.8101	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	1.2646E+09	9.9576E-15	0.0004	0.0000	0.0000
U-235m	26.000	m	7.69	0.6133	7.3648E-15	0.0000	0.0000	0.0000
Th-229	7339.2	y	2.18	8.6214E+07	6.9737E-15	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Ra-224	3.6400	d	0.82	14.51	8.6443E-16	0.0104	0.0000	0.0000
Pa-233	27.000	d	0.37	11.06	8.8838E-17	0.2175	0.0664	0.0000
Pb-210	22.160	y	0.54	2817.	7.5451E-17	0.0045	0.0061	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pu-238	87.712	y	0.34	2615.	1.7696E-17	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	7.2602E-13	3.2383E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.9561E-03	3.1292E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	4.4523E-04	3.0499E-18	0.0831	0.4240	0.0000
Fr-221	4.9000	m	4.08	3.9445E-05	2.5134E-18	0.0287	0.0000	0.0000
Ac-225	10.000	d	1.00	9.4207E-02	2.0426E-18	0.0176	0.0000	0.0000
Bi-210	5.0120	d	0.10	4.5473E-02	1.9672E-18	0.0004	0.3890	0.0000
Bi-214	19.900	m	2.01	1.0156E-04	1.5935E-18	1.5100	0.6403	0.0000
At-217	0.32300E-01	s	1.24	2.6844E-09	1.5570E-18	0.0002	0.0000	0.0000
Ra-225	14.800	d	1.35	5.3558E-02	7.8465E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	4.1306E-05	4.8122E-19	0.2513	0.2211	0.0000
Po-210	138.40	d	0.00	6.0516E-02	9.4807E-20	0.0000	0.0000	0.0000
Tl-209	2.2000	m	3.18	2.9886E-07	4.2415E-20	2.0300	0.6550	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84190E+08

Total number of decays = 6.21979E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 3.44172E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21377E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40745E-08

Composite Exposure Rate Conversion Factor = 0.896255970 R/hr per Ci/m2
Composite ECF per FGR table = 0.980495751 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651721418 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.546398699 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8832E+22	3.8356E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1629E+20	3.0126E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	7.7555E+18	714.0	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	6.0904E+15	29.26	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-226	30.570	m	0.33	2.1726E+10	2.2190E-04	0.0085	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9406E+09	1.6627E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	2.2357E+06	1.1022E-06	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1714.	9.1751E-07	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	8.010	9.1665E-07	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	2.5817E+09	5.2660E-07	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	7.5350E+09	2.3382E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	6.1356E+15	1.7020E-09	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	2.6663E+07	2.3999E-10	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	7.2182E+12	1.7773E-10	0.0001	0.0000	0.0000
Pa-231	32771.	y	0.34	1.6376E+12	2.9665E-11	0.0394	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.9583E+11	2.6758E-11	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.422	6.4621E-13	0.0160	0.8101	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
U-235m	26.000	m	7.69	1.183	1.4202E-14	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	1.5792E+09	1.2435E-14	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.0766E+08	8.7081E-15	0.0340	0.0000	0.0000
Ra-224	3.6400	d	0.82	21.55	1.2837E-15	0.0104	0.0000	0.0000
Th-227	18.720	d	0.03	99.27	1.1498E-15	0.1595	0.0000	0.0000
Pb-210	22.160	y	0.54	5759.	1.5428E-16	0.0045	0.0061	0.0000
Pa-233	27.000	d	0.37	17.19	1.3803E-16	0.2175	0.0664	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pu-238	87.712	y	0.34	3265.	2.2101E-17	0.0018	0.0099	0.0000
Po-213	0.42000E-05	s	19.05	7.1821E-13	3.2035E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1612E-04	2.8504E-18	0.0831	0.4240	0.0000
Pb-209	3.2530	h	0.43	1.4541E-03	2.3261E-18	0.0001	0.1975	0.0000
Bi-210	5.0120	d	0.10	3.6403E-02	1.5748E-18	0.0004	0.3890	0.0000
Fr-221	4.9000	m	4.08	2.2982E-05	1.4644E-18	0.0287	0.0000	0.0000
Ac-225	10.000	d	1.00	6.3620E-02	1.3794E-18	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	1.3701E-09	7.9464E-19	0.0002	0.0000	0.0000
Ra-225	14.800	d	1.35	4.6079E-02	6.7508E-19	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	5.7711E-05	6.7235E-19	0.2513	0.2211	0.0000
Rn-222	3.8230	d	0.01	3.5954E-03	2.0392E-19	0.0004	0.0000	0.0000
Bi-214	19.900	m	2.01	9.8305E-06	1.5424E-19	1.5100	0.6403	0.0000
Po-218	3.0980	m	0.26	1.4768E-06	1.4884E-19	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84170E+08

Total number of decays = 7.76770E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 4.29826E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21378E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40765E-08

Composite Exposure Rate Conversion Factor = 0.896257102 R/hr per Ci/m2
Composite ECF per FGR table = 0.980497062 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651722372 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.682398140 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8830E+22	3.8354E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1629E+20	3.0126E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	9.6855E+18	891.7	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	7.6062E+15	36.55	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-226	30.570	m	0.33	2.7132E+10	2.7712E-04	0.0085	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9398E+09	1.6623E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	3.4841E+06	1.7176E-06	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2770.	1.4827E-06	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	12.95	1.4816E-06	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	3.2243E+09	6.5768E-07	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	9.4105E+09	2.9202E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	7.6628E+15	2.1257E-09	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	3.3300E+07	2.9972E-10	0.0094	0.0478	0.0000
Pu-239	24111.	y	0.05	1.1258E+13	2.7720E-10	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	4.6141E+11	4.1735E-11	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	2.0451E+12	3.7048E-11	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	3.775	1.0075E-12	0.0160	0.8101	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
U-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
U-235m	26.000	m	7.69	2.324	2.7911E-14	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	1.9734E+09	1.5539E-14	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.3447E+08	1.0877E-14	0.0340	0.0000	0.0000
Ra-224	3.6400	d	0.82	35.87	2.1368E-15	0.0104	0.0000	0.0000
Th-227	18.720	d	0.03	99.47	1.1521E-15	0.1595	0.0000	0.0000
Pb-210	22.160	y	0.54	1.1724E+04	3.1408E-16	0.0045	0.0061	0.0000
Pa-233	27.000	d	0.37	26.81	2.1532E-16	0.2175	0.0664	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pu-238	87.712	y	0.34	4078.	2.7601E-17	0.0018	0.0099	0.0000
Ra-226	1600.0	y	0.44	2.2528E+04	8.3584E-18	0.0067	0.0000	0.0000
Rn-222	3.8230	d	0.01	0.1246	7.0669E-18	0.0004	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	1.0164E-12	4.5334E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.2168E-03	3.5463E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	3.9815E-04	2.7274E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	4.4495E-09	2.5806E-18	0.0002	0.0000	0.0000
Ra-225	14.800	d	1.35	0.1605	2.3516E-18	0.0137	0.0970	0.0000
Ac-225	10.000	d	1.00	0.1035	2.2433E-18	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.1244E-05	1.9909E-18	0.0287	0.0000	0.0000
Bi-214	19.900	m	2.01	1.2111E-04	1.9001E-18	1.5100	0.6403	0.0000
Bi-210	5.0120	d	0.10	3.0916E-02	1.3375E-18	0.0004	0.3890	0.0000
Pb-214	26.800	m	3.36	4.9523E-05	5.7696E-19	0.2513	0.2211	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84144E+08

Total number of decays = 9.70077E+18
Asympt number of decays = 1.80717E+27
Percent of decays = 5.36792E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21379E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40790E-08

Composite Exposure Rate Conversion Factor = 0.896258235 R/hr per Ci/m2
Composite ECF per FGR table = 0.980498433 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651723385 Rem/hr per Ci/m2

Actinide Source

Point in time = 0.852248371 sec

Top 50 most active radionuclides

Isotope	Half-life	m	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
							gamma	beta(-)	beta(+)	alpha
U-239	23.470		m	0.21	2.8828E+22	3.8351E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500		d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100		h	1.42	8.1629E+20	3.0126E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550		d	0.17	1.2096E+19	1114.	0.1740	0.1079	0.0000	0.0000
U-231	4.2000		d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
Np-240	1.0830		h	4.62	9.4992E+15	45.64	1.1900	0.2828	0.0000	0.0000
U-230	20.800		d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811		y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09		y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06		y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06		y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08		y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10		y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-226	30.570		m	0.33	3.3885E+10	3.4608E-04	0.0085	0.0000	0.0000	6.3060
Np-240m	7.4000		m	2.70	3.9388E+09	1.6619E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000		s	1.32	5.4287E+06	2.6763E-06	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01		s	25.71	4444.	2.3786E-06	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03		s	0.12	20.77	2.3772E-06	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630		d	0.04	4.0268E+09	8.2137E-07	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170		d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130		y	0.03	1.1753E+10	3.6471E-09	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07		y	0.47	9.5700E+15	2.6547E-09	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.		y	0.05	1.7560E+13	4.3236E-10	0.0001	0.0000	0.0000	5.1000
Th-234	24.090		d	0.12	4.1588E+07	3.7432E-10	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1		y	0.08	7.1967E+11	6.5096E-11	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.		y	0.34	2.5542E+12	4.6269E-11	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700		m	2.56	5.885	1.5705E-12	0.0160	0.8101	0.0000	0.0000
Np-235	1.0840		y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pa-232	1.3100		d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
U-235m	26.000		m	7.69	4.535	5.4462E-14	0.0000	0.0000	0.0000	0.0000
Th-230	75392.		y	0.40	2.4621E+09	1.9387E-14	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2		y	2.18	1.6793E+08	1.3583E-14	0.0340	0.0000	0.0000	4.9210
Ra-224	3.6400		d	0.82	56.67	3.3756E-15	0.0104	0.0000	0.0000	5.6740
Th-227	18.720		d	0.03	98.80	1.1443E-15	0.1595	0.0000	0.0000	5.8900
Pb-210	22.160		y	0.54	2.3769E+04	6.3674E-16	0.0045	0.0061	0.0000	0.0000
Pa-233	27.000		d	0.37	41.81	3.3578E-16	0.2175	0.0664	0.0000	0.0000
Np-236	0.15200E+06		y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pu-238	87.712		y	0.34	5093.	3.4471E-17	0.0018	0.0099	0.0000	5.4860
Po-213	0.42000E-05		s	19.05	6.8181E-13	3.0411E-18	0.0000	0.0000	0.0000	8.3760
Bi-213	45.580		m	0.13	3.8584E-04	2.6430E-18	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530		h	0.43	1.5992E-03	2.5582E-18	0.0001	0.1975	0.0000	0.0000
At-217	0.32300E-01		s	1.24	3.4931E-09	2.0260E-18	0.0002	0.0000	0.0000	7.0630
Rn-222	3.8230		d	0.01	3.5208E-02	1.9969E-18	0.0004	0.0000	0.0000	5.4890
Fr-221	4.9000		m	4.08	3.0161E-05	1.9218E-18	0.0287	0.0000	0.0000	6.3590
Po-218	3.0980		m	0.26	1.8352E-05	1.8495E-18	0.0000	0.0000	0.0000	6.0010
Bi-210	5.0120		d	0.10	3.9189E-02	1.6954E-18	0.0004	0.3890	0.0000	4.6480
Ac-225	10.000		d	1.00	5.9221E-02	1.2841E-18	0.0176	0.0000	0.0000	5.7880
Ra-225	14.800		d	1.35	7.3894E-02	1.0826E-18	0.0137	0.0970	0.0000	0.0000
Pb-214	26.800		m	3.36	6.4113E-05	7.4694E-19	0.2513	0.2211	0.0000	0.0000
Bi-214	19.900		m	2.01	6.5055E-06	1.0207E-19	1.5100	0.6403	0.0000	0.0012

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 3.84112E+08

Total number of decays = 1.21148E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 6.70373E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21380E-02
Average beta E (MeV) = 0.39422
Average alpha E (MeV) = 2.40822E-08

Composite Exposure Rate Conversion Factor = 0.896259785 R/hr per Ci/m2
Composite ECF per FGR table = 0.980500340 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651724696 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.06437480 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8825E+22	3.8347E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1629E+20	3.0126E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	1.5106E+19	1391.	0.1740	0.1079	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
Np-240	1.0830	h	4.62	1.1863E+16	57.00	1.1900	0.2828	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-226	30.570	m	0.33	4.2317E+10	4.3221E-04	0.0085	0.0000	0.0000	6.3060
Np-240m	7.4000	m	2.70	3.9375E+09	1.6613E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000	s	1.32	8.4563E+06	4.1689E-06	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	7087.	3.7932E-06	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	33.13	3.7914E-06	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630	d	0.04	5.0291E+09	1.0258E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	1.4678E+10	4.5549E-09	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.1952E+16	3.3155E-09	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.	y	0.05	2.7388E+13	6.7435E-10	0.0001	0.0000	0.0000	5.1000
Th-234	24.090	d	0.12	5.1939E+07	4.6749E-10	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.1225E+12	1.0153E-10	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.	y	0.34	3.1899E+12	5.7786E-11	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	9.173	2.4480E-12	0.0160	0.8101	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
U-235m	26.000	m	7.69	8.839	1.0614E-13	0.0000	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Th-230	75392.	y	0.40	3.0765E+09	2.4225E-14	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	2.0974E+08	1.6965E-14	0.0340	0.0000	0.0000	4.9210
Ra-224	3.6400	d	0.82	89.45	5.3280E-15	0.0104	0.0000	0.0000	5.6740
Pb-210	22.160	y	0.54	4.7762E+04	1.2795E-15	0.0045	0.0061	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Pa-233	27.000	d	0.37	65.25	5.2400E-16	0.2175	0.0664	0.0000	0.0000
Rn-220	55.800	s	0.54	2.2768E-04	7.6438E-17	0.0006	0.0000	0.0000	6.2880
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pu-238	87.712	y	0.34	6361.	4.3051E-17	0.0018	0.0099	0.0000	5.4860
Po-213	0.42000E-05	s	19.05	9.2300E-13	4.1169E-18	0.0000	0.0000	0.0000	8.3760
At-217	0.32300E-01	s	1.24	5.1484E-09	2.9860E-18	0.0002	0.0000	0.0000	7.0630
Pb-209	3.2530	h	0.43	1.7303E-03	2.7680E-18	0.0001	0.1975	0.0000	0.0000
Bi-213	45.580	m	0.13	3.8245E-04	2.6198E-18	0.0831	0.4240	0.0000	0.1222
Ac-225	10.000	d	1.00	0.1040	2.2558E-18	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	2.8806E-05	1.8355E-18	0.0287	0.0000	0.0000	6.3590
Bi-210	5.0120	d	0.10	4.0239E-02	1.7408E-18	0.0004	0.3890	0.0000	4.6480
Ra-225	14.800	d	1.35	5.4114E-02	7.9279E-19	0.0137	0.0970	0.0000	0.0000
Pb-214	26.800	m	3.36	6.5109E-05	7.5854E-19	0.2513	0.2211	0.0000	0.0000
Rn-222	3.8230	d	0.01	6.1814E-03	3.5058E-19	0.0004	0.0000	0.0000	5.4890
Bi-214	19.900	m	2.01	1.0707E-05	1.6799E-19	1.5100	0.6403	0.0000	0.0012

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.84073E+08

Total number of decays = 1.51294E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 8.37187E-07
Average chain length = 11.185

Average gamma E (MeV) = 5.21381E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.40862E-08

Composite Exposure Rate Conversion Factor = 0.896261632 R/hr per Ci/m2
Composite ECF per FGR table = 0.980502546 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651726186 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.32929909 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8821E+22	3.8342E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1629E+20	3.0126E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.8864E+19	1737.	0.1740	0.1079	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
Np-240	1.0830	h	4.62	1.4816E+16	71.19	1.1900	0.2828	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-226	30.570	m	0.33	5.2847E+10	5.3976E-04	0.0085	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9358E+09	1.6606E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	1.3168E+07	6.4918E-06	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.1245E+04	6.0191E-06	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	52.58	6.0169E-06	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2809E+09	1.2811E-06	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	1.8332E+10	5.6886E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.4927E+16	4.1407E-09	0.0320	0.0000	0.0000
Pu-239	24111.	y	0.05	4.2717E+13	1.0518E-09	0.0001	0.0000	0.0000
Th-234	24.090	d	0.12	6.4867E+07	5.8385E-10	0.0094	0.0478	0.0000
Pu-240	6563.1	y	0.08	1.7508E+12	1.5836E-10	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	3.9839E+12	7.2169E-11	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	14.30	3.8149E-12	0.0160	0.8101	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	17.22	2.0685E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	3.8420E+09	3.0253E-14	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.6192E+08	2.1186E-14	0.0340	0.0000	0.0000
Ra-224	3.6400	d	0.82	138.4	8.2450E-15	0.0104	0.0000	0.0000
Pb-210	22.160	y	0.54	9.5423E+04	2.5563E-15	0.0045	0.0061	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Pa-233	27.000	d	0.37	101.9	8.1811E-16	0.2175	0.0664	0.0000
Pu-238	87.712	y	0.34	7944.	5.3767E-17	0.0018	0.0099	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-220	55.800	s	0.54	9.7889E-05	3.2864E-17	0.0006	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.0485E-13	3.1439E-18	0.0000	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.3843E-05	2.1565E-18	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	3.3209E-09	1.9261E-18	0.0002	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.1058E-03	1.7690E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	2.3727E-04	1.6253E-18	0.0831	0.4240	0.0000
Ac-225	10.000	d	1.00	7.2355E-02	1.5688E-18	0.0176	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.4703E-02	1.5013E-18	0.0004	0.3890	0.0000
Po-210	138.40	d	0.00	0.9068	1.4206E-18	0.0000	0.0000	0.0000
Pb-214	26.800	m	3.36	5.4876E-05	6.3932E-19	0.2513	0.2211	0.0000
Bi-214	19.900	m	2.01	1.5957E-05	2.5037E-19	1.5100	0.6403	0.0000
Ra-225	14.800	d	1.35	1.0527E-02	1.5423E-19	0.0137	0.0970	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.84023E+08

Total number of decays = 1.88939E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 1.04550E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21383E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.40912E-08

Composite Exposure Rate Conversion Factor = 0.896264076 R/hr per Ci/m2
Composite ECF per FGR table = 0.980505407 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651728153 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.66016436 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8816E+22	3.8335E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1628E+20	3.0126E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	2.3557E+19	2169.	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	1.8503E+16	88.91	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-226	30.570	m	0.33	6.5997E+10	6.7406E-04	0.0085	0.0000	0.0000	6.3060
Np-240m	7.4000	m	2.70	3.9338E+09	1.6598E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000	s	1.32	2.0497E+07	1.0105E-05	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.7771E+04	9.5117E-06	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	83.09	9.5090E-06	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630	d	0.04	7.8442E+09	1.6000E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	2.2894E+10	7.1045E-09	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.8642E+16	5.1714E-09	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.	y	0.05	6.6624E+13	1.6404E-09	0.0001	0.0000	0.0000	5.1000
Th-234	24.090	d	0.12	8.1013E+07	7.2917E-10	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.7307E+12	2.4700E-10	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.	y	0.34	4.9755E+12	9.0132E-11	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	22.27	5.9438E-12	0.0160	0.8101	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
U-235m	26.000	m	7.69	33.56	4.0299E-13	0.0000	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Th-230	75392.	y	0.40	4.7983E+09	3.7783E-14	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	3.2711E+08	2.6459E-14	0.0340	0.0000	0.0000	4.9210
Ra-224	3.6400	d	0.82	216.4	1.2889E-14	0.0104	0.0000	0.0000	5.6740
Pb-210	22.160	y	0.54	1.8963E+05	5.0800E-15	0.0045	0.0061	0.0000	0.0000
Pa-233	27.000	d	0.37	158.8	1.2754E-15	0.2175	0.0664	0.0000	0.0000
Th-227	18.720	d	0.03	98.91	1.1457E-15	0.1595	0.0000	0.0000	5.8900
Rn-220	55.800	s	0.54	3.7383E-04	1.2550E-16	0.0006	0.0000	0.0000	6.2880
Pu-238	87.712	y	0.34	9921.	6.7150E-17	0.0018	0.0099	0.0000	5.4860
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Rn-222	3.8230	d	0.01	0.1558	8.8383E-18	0.0004	0.0000	0.0000	5.4890
Po-210	138.40	d	0.00	2.374	3.7189E-18	0.0000	0.0000	0.0000	5.3040
Po-213	0.42000E-05	s	19.05	6.1132E-13	2.7267E-18	0.0000	0.0000	0.0000	8.3760
Bi-213	45.580	m	0.13	3.7685E-04	2.5815E-18	0.0831	0.4240	0.0000	0.1222
Fr-221	4.9000	m	4.08	3.5927E-05	2.2893E-18	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	3.8847E-09	2.2531E-18	0.0002	0.0000	0.0000	7.0630
Pb-209	3.2530	h	0.43	1.3816E-03	2.2102E-18	0.0001	0.1975	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.0717E-02	2.1941E-18	0.0004	0.3890	0.0000	4.6480
Ac-225	10.000	d	1.00	8.5587E-02	1.8557E-18	0.0176	0.0000	0.0000	5.7880
Ra-225	14.800	d	1.35	5.1471E-02	7.5407E-19	0.0137	0.0970	0.0000	0.0000
Pb-214	26.800	m	3.36	4.3901E-05	5.1146E-19	0.2513	0.2211	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83961E+08

Total number of decays = 2.35948E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 1.30562E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21384E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.40975E-08

Composite Exposure Rate Conversion Factor = 0.896266937 R/hr per Ci/m2
Composite ECF per FGR table = 0.980508983 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651730597 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.07338262 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8811E+22	3.8328E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1628E+20	3.0126E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	2.9418E+19	2709.	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	2.3107E+16	111.0	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-226	30.570	m	0.33	8.2417E+10	8.4177E-04	0.0085	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9313E+09	1.6587E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	3.1889E+07	1.5721E-05	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.7984E+04	1.4978E-05	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	130.9	1.4975E-05	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	9.7966E+09	1.9983E-06	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	2.8593E+10	8.8728E-09	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.3282E+16	6.4585E-09	0.0320	0.0000	0.0000
Pu-239	24111.	y	0.05	1.0391E+14	2.5585E-09	0.0001	0.0000	0.0000
Th-234	24.090	d	0.12	1.0118E+08	9.1066E-10	0.0094	0.0478	0.0000
Pu-240	6563.1	y	0.08	4.2592E+12	3.8525E-10	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	6.2139E+12	1.1257E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	34.69	9.2584E-12	0.0160	0.8101	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	65.37	7.8505E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-230	75392.	y	0.40	5.9937E+09	4.7195E-14	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	4.0853E+08	3.3045E-14	0.0340	0.0000	0.0000
Ra-224	3.6400	d	0.82	338.9	2.0186E-14	0.0104	0.0000	0.0000
Pb-210	22.160	y	0.54	3.7524E+05	1.0052E-14	0.0045	0.0000	0.0000
Pa-233	27.000	d	0.37	247.8	1.9896E-15	0.2175	0.0664	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Rn-220	55.800	s	0.54	5.5836E-04	1.8746E-16	0.0006	0.0000	0.0000
Pu-238	87.712	y	0.34	1.2391E+04	8.3863E-17	0.0018	0.0099	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-210	5.0120	d	0.10	0.3964	1.7149E-17	0.0004	0.3890	0.0000
Po-218	3.0980	m	0.26	1.4379E-04	1.4492E-17	0.0000	0.0000	0.0000
Rn-222	3.8230	d	0.01	0.1439	8.1601E-18	0.0004	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	8.0255E-13	3.5797E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1329E-04	2.8311E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	4.7399E-09	2.7491E-18	0.0002	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.6317E-03	2.6102E-18	0.0001	0.1975	0.0000
Fr-221	4.9000	m	4.08	3.6125E-05	2.3019E-18	0.0287	0.0000	0.0000
Ac-225	10.000	d	1.00	0.1055	2.2878E-18	0.0176	0.0000	0.0000
Ra-225	14.800	d	1.35	8.4655E-02	1.2402E-18	0.0137	0.0970	0.0000
Pb-214	26.800	m	3.36	2.8196E-05	3.2849E-19	0.2513	0.2211	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83883E+08

Total number of decays = 2.94646E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 1.63042E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21387E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41054E-08

Composite Exposure Rate Conversion Factor = 0.896270752 R/hr per Ci/m2
Composite ECF per FGR table = 0.980513453 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651733637 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.58945155 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8803E+22	3.8318E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1627E+20	3.0126E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	3.6735E+19	3382.	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	2.8857E+16	138.7	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-226	30.570	m	0.33	1.0292E+11	1.0512E-03	0.0085	0.0000	0.0000	6.3060
Np-240m	7.4000	m	2.70	3.9281E+09	1.6574E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000	s	1.32	4.9581E+07	2.4443E-05	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	4.3934E+04	2.3516E-05	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	205.4	2.3511E-05	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630	d	0.04	1.2235E+10	2.4956E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	3.5709E+10	1.1081E-08	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.9077E+16	8.0661E-09	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.	y	0.05	1.6206E+14	3.9902E-09	0.0001	0.0000	0.0000	5.1000
Th-234	24.090	d	0.12	1.2636E+08	1.1373E-09	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1	y	0.08	6.6430E+12	6.0087E-10	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.	y	0.34	7.7605E+12	1.4058E-10	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	54.02	1.4416E-11	0.0160	0.8101	0.0000	0.0000
U-235m	26.000	m	7.69	127.3	1.5291E-12	0.0000	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Th-230	75392.	y	0.40	7.4826E+09	5.8920E-14	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	5.1022E+08	4.1270E-14	0.0340	0.0000	0.0000	4.9210
Ra-224	3.6400	d	0.82	529.8	3.1558E-14	0.0104	0.0000	0.0000	5.6740
Pb-210	22.160	y	0.54	7.3966E+05	1.9815E-14	0.0045	0.0061	0.0000	0.0000
Pa-233	27.000	d	0.37	386.4	3.1028E-15	0.2175	0.0664	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Rn-220	55.800	s	0.54	1.0399E-03	3.4912E-16	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1.3202E-06	1.6488E-16	0.0000	0.0000	0.0000	6.7780
Pu-238	87.712	y	0.34	1.5475E+04	1.0474E-16	0.0018	0.0099	0.0000	5.4860
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.8875E-13	3.5181E-18	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.9044E-03	3.0464E-18	0.0001	0.1975	0.0000	0.0000
Bi-213	45.580	m	0.13	4.0658E-04	2.7851E-18	0.0831	0.4240	0.0000	0.1222
Fr-221	4.9000	m	4.08	3.4504E-05	2.1986E-18	0.0287	0.0000	0.0000	6.3590
Bi-210	5.0120	d	0.10	4.8056E-02	2.0790E-18	0.0004	0.3890	0.0000	4.6480
At-217	0.32300E-01	s	1.24	1.9339E-09	1.1217E-18	0.0002	0.0000	0.0000	7.0630
Ac-225	10.000	d	1.00	5.1695E-02	1.1209E-18	0.0176	0.0000	0.0000	5.7880
Pb-214	26.800	m	3.36	5.8093E-05	6.7680E-19	0.2513	0.2211	0.0000	0.0000
Pa-234	6.7810	h	0.44	6.9191E-04	5.3098E-19	1.9000	0.2120	0.0000	0.0000
Ra-225	14.800	d	1.35	3.2155E-02	4.7109E-19	0.0137	0.0970	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83787E+08

Total number of decays = 3.67937E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 2.03598E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21390E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41154E-08

Composite Exposure Rate Conversion Factor = 0.896275342 R/hr per Ci/m2
Composite ECF per FGR table = 0.980518937 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651737571 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.23397112 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8794E+22	3.8306E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1626E+20	3.0125E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	4.5872E+19	4223.	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	3.6038E+16	173.2	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-226	30.570	m	0.33	1.2852E+11	1.3127E-03	0.0085	0.0000	0.0000	6.3060
Np-240m	7.4000	m	2.70	3.9241E+09	1.6557E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000	s	1.32	7.7029E+07	3.7975E-05	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	6.8787E+04	3.6818E-05	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	321.7	3.6813E-05	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630	d	0.04	1.5280E+10	3.1168E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	4.4598E+10	1.3839E-08	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.6315E+16	1.0074E-08	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.	y	0.05	2.5275E+14	6.2231E-09	0.0001	0.0000	0.0000	5.1000
Th-234	24.090	d	0.12	1.5781E+08	1.4204E-09	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.0361E+13	9.3717E-10	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.	y	0.34	9.6922E+12	1.7558E-10	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	84.08	2.2439E-11	0.0160	0.8101	0.0000	0.0000
U-235m	26.000	m	7.69	248.0	2.9782E-12	0.0000	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Th-230	75392.	y	0.40	9.3470E+09	7.3600E-14	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	6.3721E+08	5.1543E-14	0.0340	0.0000	0.0000	4.9210
Ra-224	3.6400	d	0.82	826.7	4.9242E-14	0.0104	0.0000	0.0000	5.6740
Pb-210	22.160	y	0.54	1.4531E+06	3.8928E-14	0.0045	0.0061	0.0000	0.0000
Pa-233	27.000	d	0.37	602.7	4.8399E-15	0.2175	0.0664	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Rn-220	55.800	s	0.54	1.9745E-03	6.6289E-16	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	3.2269E-06	4.0301E-16	0.0000	0.0000	0.0000	6.7780
Pu-238	87.712	y	0.34	1.9327E+04	1.3081E-16	0.0018	0.0099	0.0000	5.4860
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.0900E-03	3.3434E-18	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	6.9771E-13	3.1121E-18	0.0000	0.0000	0.0000	8.3760
Pb-212	10.640	h	0.09	5.9628E-03	2.9163E-18	0.1437	0.0998	0.0000	0.0000
Bi-213	45.580	m	0.13	4.2445E-04	2.9075E-18	0.0831	0.4240	0.0000	0.1222
Ac-225	10.000	d	1.00	0.1245	2.7003E-18	0.0176	0.0000	0.0000	5.7880
Ra-225	14.800	d	1.35	0.1278	1.8725E-18	0.0137	0.0970	0.0000	0.0000
Fr-221	4.9000	m	4.08	2.8821E-05	1.8364E-18	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	2.9554E-09	1.7141E-18	0.0002	0.0000	0.0000	7.0630
Bi-210	5.0120	d	0.10	2.4834E-02	1.0744E-18	0.0004	0.3890	0.0000	4.6480
Pa-234	6.7810	h	0.44	1.3462E-03	1.0331E-18	1.9000	0.2120	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83666E+08

Total number of decays = 4.59446E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 2.54234E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21394E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41280E-08

Composite Exposure Rate Conversion Factor = 0.896281004 R/hr per Ci/m2
Composite ECF per FGR table = 0.980525911 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651742339 Rem/hr per Ci/m2

Actinide Source

Point in time = 4.03891134 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8783E+22	3.8291E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4480E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1625E+20	3.0125E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	5.7278E+19	5274.	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	4.5004E+16	216.2	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-226	30.570	m	0.33	1.6049E+11	1.6391E-03	0.0085	0.0000	0.0000	6.3060
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.9192E+09	1.6536E-04	0.3148	0.6243	0.0000	0.0000
Ra-222	38.000	s	1.32	1.1955E+08	5.8939E-05	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.0743E+05	5.7501E-05	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	502.4	5.7494E-05	0.0002	0.0000	0.0000	7.6870
Th-231	1.0630	d	0.04	1.9083E+10	3.8925E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6152E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	5.5698E+10	1.7284E-08	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	4.5354E+16	1.2581E-08	0.0320	0.0000	0.0000	4.7900
Pu-239	24111.	y	0.05	3.9417E+14	9.7053E-09	0.0001	0.0000	0.0000	5.1000
Th-234	24.090	d	0.12	1.9709E+08	1.7739E-09	0.0094	0.0478	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.6160E+13	1.4617E-09	0.0000	0.0000	0.0000	5.1550
Pa-231	32771.	y	0.34	1.2105E+13	2.1928E-10	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	130.8	3.4907E-11	0.0160	0.8101	0.0000	0.0000
U-235m	26.000	m	7.69	483.0	5.8005E-12	0.0000	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Th-230	75392.	y	0.40	1.1673E+10	9.1913E-14	0.0004	0.0000	0.0000	4.6640
Ra-224	3.6400	d	0.82	1290.	7.6858E-14	0.0104	0.0000	0.0000	5.6740
Pb-210	22.160	y	0.54	2.8464E+06	7.6251E-14	0.0045	0.0061	0.0000	0.0000
Th-229	7339.2	y	2.18	7.9580E+08	6.4371E-14	0.0340	0.0000	0.0000	4.9210
Pa-233	27.000	d	0.37	940.1	7.5497E-15	0.2175	0.0664	0.0000	0.0000
Rn-220	55.800	s	0.54	3.6246E-03	1.2169E-15	0.0006	0.0000	0.0000	6.2880
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000	5.8900
Po-216	0.15000	s	3.33	7.7540E-06	9.6841E-16	0.0000	0.0000	0.0000	6.7780
Pu-238	87.712	y	0.34	2.4137E+04	1.6336E-16	0.0018	0.0099	0.0000	5.4860
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Rn-222	3.8230	d	0.01	8.2339E-02	4.6700E-18	0.0004	0.0000	0.0000	5.4890
Bi-210	5.0120	d	0.10	0.1030	4.4543E-18	0.0004	0.3890	0.0000	4.6480
Bi-213	45.580	m	0.13	4.8464E-04	3.3198E-18	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	2.0134E-03	3.2209E-18	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	5.9133E-13	2.6376E-18	0.0000	0.0000	0.0000	8.3760
Fr-221	4.9000	m	4.08	4.0980E-05	2.6112E-18	0.0287	0.0000	0.0000	6.3590
Ac-225	10.000	d	1.00	0.1087	2.3577E-18	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	3.5730E-09	2.0723E-18	0.0002	0.0000	0.0000	7.0630
Pa-234	6.7810	h	0.44	2.6169E-03	2.0083E-18	1.9000	0.2120	0.0000	0.0000
Po-218	3.0980	m	0.26	1.6568E-05	1.6698E-18	0.0000	0.0000	0.0000	6.0010

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83516E+08

Total number of decays = 5.73690E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 3.17451E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21399E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41440E-08

Composite Exposure Rate Conversion Factor = 0.896288216 R/hr per Ci/m2
Composite ECF per FGR table = 0.980534554 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651748300 Rem/hr per Ci/m2

Actinide Source

Point in time = 5.04420424 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8768E+22	3.8272E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4479E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1624E+20	3.0125E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	7.1517E+19	6585.	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	5.6200E+16	270.0	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Th-226	30.570	m	0.33	2.0039E+11	2.0467E-03	0.0085	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9131E+09	1.6510E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	1.8533E+08	9.1366E-05	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.6737E+05	8.9582E-05	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	782.7	8.9574E-05	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	2.3833E+10	4.8614E-06	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6151E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	6.9561E+10	2.1586E-08	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	5.6642E+16	1.5712E-08	0.0320	0.0000	0.0000
Pu-239	24111.	y	0.05	6.1471E+14	1.5135E-08	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.5204E+13	2.2797E-09	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	2.4615E+08	2.2155E-09	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	1.5117E+13	2.7385E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	203.4	5.4267E-11	0.0160	0.8101	0.0000
U-235m	26.000	m	7.69	940.7	1.1297E-11	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pb-210	22.160	y	0.54	5.5602E+06	1.4895E-13	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	2013.	1.1993E-13	0.0104	0.0000	0.0000
Th-230	75392.	y	0.40	1.4577E+10	1.1478E-13	0.0004	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-229	7339.2	y	2.18	9.9387E+08	8.0392E-14	0.0340	0.0000	0.0000
Pa-233	27.000	d	0.37	1466.	1.1775E-14	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	7.3402E-03	2.4643E-15	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.6369E-05	2.0444E-15	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	3.0145E+04	2.0402E-16	0.0018	0.0099	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-210	5.0120	d	0.10	0.2629	1.1373E-17	0.0004	0.3890	0.0000
Pa-234	6.7810	h	0.44	5.0849E-03	3.9022E-18	1.9000	0.2120	0.0000
Pb-209	3.2530	h	0.43	1.8926E-03	3.0275E-18	0.0001	0.1975	0.0000
Po-213	0.42000E-05	s	19.05	5.7797E-13	2.5780E-18	0.0000	0.0000	0.0000
At-217	0.32300E-01	s	1.24	4.3446E-09	2.5198E-18	0.0002	0.0000	0.0000
Bi-213	45.580	m	0.13	3.3047E-04	2.2638E-18	0.0831	0.4240	0.0000
Ac-225	10.000	d	1.00	7.8157E-02	1.6946E-18	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	2.3324E-05	1.4862E-18	0.0287	0.0000	0.0000
Ra-225	14.800	d	1.35	5.9958E-02	8.7841E-19	0.0137	0.0970	0.0000
Ac-227	21.770	y	0.01	25.63	6.9877E-19	0.0002	0.0097	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.83327E+08

Total number of decays = 7.16306E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 3.96368E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21405E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41644E-08

Composite Exposure Rate Conversion Factor = 0.896297097 R/hr per Ci/m2
Composite ECF per FGR table = 0.980545282 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651755691 Rem/hr per Ci/m2

Actinide Source

Point in time = 6.29971647 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8751E+22	3.8248E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4479E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1623E+20	3.0124E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	8.9289E+19	8221.	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	7.0180E+16	337.2	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Th-226	30.570	m	0.33	2.5021E+11	2.5556E-03	0.0085	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.9054E+09	1.6478E-04	0.3148	0.6243	0.0000
Ra-222	38.000	s	1.32	2.8686E+08	1.4142E-04	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.6009E+05	1.3921E-04	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1216.	1.3920E-04	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	2.9765E+10	6.0714E-06	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6151E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	8.6875E+10	2.6959E-08	0.0031	0.0000	0.0000
Pu-239	24111.	y	0.05	9.5860E+14	2.3603E-08	0.0001	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	7.0740E+16	1.9623E-08	0.0320	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.9309E+13	3.5555E-09	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	3.0741E+08	2.7669E-09	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	1.8880E+13	3.4202E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	315.9	8.4298E-11	0.0160	0.8101	0.0000
U-235m	26.000	m	7.69	1832.	2.1999E-11	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pb-210	22.160	y	0.54	1.0833E+07	2.9021E-13	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	3141.	1.8712E-13	0.0104	0.0000	0.0000
Th-230	75392.	y	0.40	1.8207E+10	1.4337E-13	0.0004	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000
Th-229	7339.2	y	2.18	1.2413E+09	1.0040E-13	0.0340	0.0000	0.0000
Pa-233	27.000	d	0.37	2287.	1.8366E-14	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	1.4274E-02	4.7922E-15	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	3.3813E-05	4.2230E-15	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	3.7648E+04	2.5481E-16	0.0018	0.0099	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pa-234	6.7810	h	0.44	9.8748E-03	7.5780E-18	1.9000	0.2120	0.0000
Po-213	0.42000E-05	s	19.05	8.9479E-13	3.9911E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.1181E-03	3.3883E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	4.4556E-04	3.0521E-18	0.0831	0.4240	0.0000
Fr-221	4.9000	m	4.08	4.4957E-05	2.8647E-18	0.0287	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.8508E-02	2.5311E-18	0.0004	0.3890	0.0000
At-217	0.32300E-01	s	1.24	4.1669E-09	2.4168E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	9.6209E-02	2.0861E-18	0.0176	0.0000	0.0000
Ra-225	14.800	d	1.35	9.6134E-02	1.4084E-18	0.0137	0.0970	0.0000
Ra-223	11.430	d	0.17	5.8950E-02	1.1183E-18	0.1351	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.83093E+08

Total number of decays = 8.94323E+19
Asympt number of decays = 1.80717E+27
Percent of decays = 4.94874E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21412E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.41903E-08

Composite Exposure Rate Conversion Factor = 0.896308362 R/hr per Ci/m2
Composite ECF per FGR table = 0.980558693 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651764989 Rem/hr per Ci/m2

Actinide Source

Point in time = 7.86772490 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8729E+22	3.8218E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4479E+21	3.0349E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1621E+20	3.0123E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	1.1147E+20	1.0263E+04	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	8.7635E+16	421.1	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-226	30.570	m	0.33	3.1240E+11	3.1907E-03	0.0085	0.0000	0.0000	6.3060
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Ra-222	38.000	s	1.32	4.4319E+08	2.1849E-04	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	4.0312E+05	2.1577E-04	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	1885.	2.1576E-04	0.0002	0.0000	0.0000	7.6870
Np-240m	7.4000	m	2.70	3.8959E+09	1.6438E-04	0.3148	0.6243	0.0000	0.0000
Th-231	1.0630	d	0.04	3.7174E+10	7.5825E-06	0.0225	0.0794	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5770E+09	1.6151E-07	0.6470	0.2105	0.0000	0.0000
Pu-239	24111.	y	0.05	1.4948E+15	3.6805E-08	0.0001	0.0000	0.0000	5.1000
Th-228	1.9130	y	0.03	1.0850E+11	3.3669E-08	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	8.8348E+16	2.4508E-08	0.0320	0.0000	0.0000	4.7900
Pu-240	6563.1	y	0.08	6.1305E+13	5.5452E-09	0.0000	0.0000	0.0000	5.1550
Th-234	24.090	d	0.12	3.8393E+08	3.4556E-09	0.0094	0.0478	0.0000	0.0000
Pa-231	32771.	y	0.34	2.3579E+13	4.2714E-10	0.0394	0.0000	0.0000	4.9240
Pa-234m	1.1700	m	2.56	490.2	1.3082E-10	0.0160	0.8101	0.0000	0.0000
U-235m	26.000	m	7.69	3567.	4.2838E-11	0.0000	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Pb-210	22.160	y	0.54	2.1053E+07	5.6397E-13	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400	d	0.82	4900.	2.9186E-13	0.0104	0.0000	0.0000	5.6740
Th-230	75392.	y	0.40	2.2739E+10	1.7905E-13	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	1.5502E+09	1.2539E-13	0.0340	0.0000	0.0000	4.9210
Pa-232	1.3100	d	1.53	633.3	1.0482E-13	0.9334	0.0935	0.0000	0.0000
Pa-233	27.000	d	0.37	3567.	2.8647E-14	0.2175	0.0664	0.0000	0.0000
Rn-220	55.800	s	0.54	2.7498E-02	9.2320E-15	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	6.7369E-05	8.4138E-15	0.0000	0.0000	0.0000	6.7780
Th-227	18.720	d	0.03	99.06	1.1474E-15	0.1595	0.0000	0.0000	5.8900
Pu-238	87.712	y	0.34	4.7018E+04	3.1823E-16	0.0018	0.0099	0.0000	5.4860
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.9162E-02	1.4705E-17	1.9000	0.2120	0.0000	0.0000
Bi-210	5.0120	d	0.10	0.3162	1.3679E-17	0.0004	0.3890	0.0000	4.6480
Rn-222	3.8230	d	0.01	0.1409	7.9888E-18	0.0004	0.0000	0.0000	5.4890
Po-218	3.0980	m	0.26	6.6437E-05	6.6957E-18	0.0000	0.0000	0.0000	6.0010
Po-213	0.42000E-05	s	19.05	9.2801E-13	4.1393E-18	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	2.0929E-03	3.3480E-18	0.0001	0.1975	0.0000	0.0000
Bi-213	45.580	m	0.13	4.4530E-04	3.0503E-18	0.0831	0.4240	0.0000	0.1222
Ac-225	10.000	d	1.00	0.1238	2.6837E-18	0.0176	0.0000	0.0000	5.7880
Po-215	0.17800E-02	s	0.56	2.2459E-10	2.3637E-18	0.0000	0.0000	0.0000	7.3920
Fr-221	4.9000	m	4.08	3.4971E-05	2.2284E-18	0.0287	0.0000	0.0000	6.3590

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.82800E+08

Total number of decays = 1.11649E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 6.17812E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21421E-02
Average beta E (MeV) = 0.39421
Average alpha E (MeV) = 2.42235E-08

Composite Exposure Rate Conversion Factor = 0.896322429 R/hr per Ci/m2
Composite ECF per FGR table = 0.980575621 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651776671 Rem/hr per Ci/m2

Actinide Source

Point in time = 9.82601738 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8701E+22	3.8182E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4479E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1619E+20	3.0123E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.3915E+20	1.2811E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.0943E+17	525.8	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Th-226	30.570	m	0.33	3.9001E+11	3.9834E-03	0.0085	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Ra-222	38.000	s	1.32	6.8313E+08	3.3678E-04	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	6.2295E+05	3.3343E-04	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2913.	3.3342E-04	0.0002	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.8840E+09	1.6388E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	4.6426E+10	9.4697E-06	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5769E+09	1.6151E-07	0.6470	0.2105	0.0000
Pu-239	24111.	y	0.05	2.3308E+15	5.7388E-08	0.0001	0.0000	0.0000
Th-228	1.9130	y	0.03	1.3550E+11	4.2049E-08	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.1034E+17	3.0608E-08	0.0320	0.0000	0.0000
Pu-240	6563.1	y	0.08	9.5610E+13	8.6481E-09	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	4.7949E+08	4.3157E-09	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	2.9448E+13	5.3346E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	759.7	2.0275E-10	0.0160	0.8101	0.0000
U-235m	26.000	m	7.69	6946.	8.3410E-11	0.0000	0.0000	0.0000
Pb-210	22.160	y	0.54	4.0803E+07	1.0931E-12	0.0045	0.0061	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Ra-224	3.6400	d	0.82	7644.	4.5531E-13	0.0104	0.0000	0.0000
Th-230	75392.	y	0.40	2.8400E+10	2.2362E-13	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.9361E+09	1.5660E-13	0.0340	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0481E-13	0.9334	0.0935	0.0000
Pa-233	27.000	d	0.37	5564.	4.4682E-14	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	5.3554E-02	1.7980E-14	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.3458E-04	1.6807E-14	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	5.8721E+04	3.9743E-16	0.0018	0.0099	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pa-234	6.7810	h	0.44	3.7150E-02	2.8509E-17	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	3.9920E-02	1.9524E-17	0.1437	0.0998	0.0000
Bi-210	5.0120	d	0.10	0.1555	6.7289E-18	0.0004	0.3890	0.0000
Po-213	0.42000E-05	s	19.05	1.0358E-12	4.6202E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.4233E-03	3.8765E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	5.4312E-04	3.7205E-18	0.0831	0.4240	0.0000
Ra-223	11.430	d	0.17	0.1406	2.6679E-18	0.1351	0.0000	0.0000
Ac-227	21.770	y	0.01	96.88	2.6417E-18	0.0002	0.0097	0.0000
At-217	0.32300E-01	s	1.24	4.0523E-09	2.3503E-18	0.0002	0.0000	0.0000
Ac-225	10.000	d	1.00	0.1042	2.2589E-18	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 85
Total activity (Ci) = 3.82434E+08

Total number of decays = 1.39373E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 7.71219E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21433E-02
Average beta E (MeV) = 0.39420
Average alpha E (MeV) = 2.42663E-08

Composite Exposure Rate Conversion Factor = 0.896340013 R/hr per Ci/m2
Composite ECF per FGR table = 0.980596721 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651791215 Rem/hr per Ci/m2

Actinide Source

Point in time = 12.2717333 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8666E+22	3.8136E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4479E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1616E+20	3.0122E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.7368E+20	1.5990E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.3663E+17	656.5	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
Th-226	30.570	m	0.33	4.8686E+11	4.9726E-03	0.0085	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Ra-222	38.000	s	1.32	1.0500E+09	5.1763E-04	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	9.5944E+05	5.1354E-04	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	4487.	5.1352E-04	0.0002	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.8692E+09	1.6325E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	5.7981E+10	1.1827E-05	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5769E+09	1.6151E-07	0.6470	0.2105	0.0000
Pu-239	24111.	y	0.05	3.6340E+15	8.9475E-08	0.0001	0.0000	0.0000
Th-228	1.9130	y	0.03	1.6923E+11	5.2515E-08	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.3780E+17	3.8226E-08	0.0320	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.4910E+14	1.3487E-08	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	5.9884E+08	5.3899E-09	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	3.6778E+13	6.6624E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1176.	3.1375E-10	0.0160	0.8101	0.0000
U-235m	26.000	m	7.69	1.3522E+04	1.6239E-10	0.0000	0.0000	0.0000
Pb-210	22.160	y	0.54	7.8851E+07	2.1123E-12	0.0045	0.0061	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.1921E+04	7.1011E-13	0.0104	0.0000	0.0000
Th-230	75392.	y	0.40	3.5469E+10	2.7929E-13	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.4179E+09	1.9558E-13	0.0340	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.3	1.0481E-13	0.9334	0.0935	0.0000
Pa-233	27.000	d	0.37	8678.	6.9692E-14	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	0.1036	3.4798E-14	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	2.6363E-04	3.2925E-14	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	99.96	1.1578E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	7.3336E+04	4.9635E-16	0.0018	0.0099	0.0000
Pa-234	6.7810	h	0.44	7.1936E-02	5.5204E-17	1.9000	0.2120	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-210	5.0120	d	0.10	0.5644	2.4417E-17	0.0004	0.3890	0.0000
Po-218	3.0980	m	0.26	9.4623E-05	9.5365E-18	0.0000	0.0000	0.0000
Rn-222	3.8230	d	0.01	0.1003	5.6903E-18	0.0004	0.0000	0.0000
Ac-227	21.770	y	0.01	151.3	4.1244E-18	0.0002	0.0097	0.0000
Pb-211	36.100	m	0.55	4.4242E-04	3.8265E-18	0.0637	0.4455	0.0000
Po-213	0.42000E-05	s	19.05	7.6594E-13	3.4164E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.0108E-03	3.2167E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	3.2579E-04	2.2317E-18	0.0831	0.4240	0.0000
Ac-225	10.000	d	1.00	8.7556E-02	1.8984E-18	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.81978E+08

Total number of decays = 1.73959E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 9.62603E-06
Average chain length = 11.185

Average gamma E (MeV) = 5.21447E-02
Average beta E (MeV) = 0.39420
Average alpha E (MeV) = 2.43217E-08

Composite Exposure Rate Conversion Factor = 0.896361947 R/hr per Ci/m2
Composite ECF per FGR table = 0.980623007 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651809394 Rem/hr per Ci/m2

Actinide Source

Point in time = 15.3261919 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8623E+22	3.8078E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4478E+21	3.0349E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1613E+20	3.0120E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	2.1674E+20	1.9955E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.7059E+17	819.7	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5690E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	6.0769E+11	6.2067E-03	0.0085	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Ra-222	38.000	s	1.32	1.6082E+09	7.9281E-04	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.4719E+06	7.8783E-04	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	6884.	7.8781E-04	0.0002	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.8508E+09	1.6248E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	7.2411E+10	1.4770E-05	0.0225	0.0794	0.0000
Np-238	2.1170	d	0.09	1.5769E+09	1.6151E-07	0.6470	0.2105	0.0000
Pu-239	24111.	y	0.05	5.6652E+15	1.3949E-07	0.0001	0.0000	0.0000
Th-228	1.9130	y	0.03	2.1135E+11	6.5586E-08	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.7210E+17	4.7740E-08	0.0320	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.3252E+14	2.1032E-08	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	7.4789E+08	6.7315E-09	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	4.5932E+13	8.3206E-10	0.0394	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1816.	4.8458E-10	0.0160	0.8101	0.0000
U-235m	26.000	m	7.69	2.6323E+04	3.1610E-10	0.0000	0.0000	0.0000
Pb-210	22.160	y	0.54	1.5188E+08	4.0687E-12	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	1.8595E+04	1.1077E-12	0.0104	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Th-230	75392.	y	0.40	4.4294E+10	3.4878E-13	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	3.0198E+09	2.4426E-13	0.0340	0.0000	0.0000
Pa-233	27.000	d	0.37	1.3536E+04	1.0870E-13	0.2175	0.0664	0.0000
Pa-232	1.3100	d	1.53	633.2	1.0481E-13	0.9334	0.0935	0.0000
Rn-220	55.800	s	0.54	0.1997	6.7055E-14	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	5.1430E-04	6.4232E-14	0.0000	0.0000	0.0000
Th-227	18.720	d	0.03	100.7	1.1666E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	9.1589E+04	6.1989E-16	0.0018	0.0099	0.0000
Pa-234	6.7810	h	0.44	0.1391	1.0674E-16	1.9000	0.2120	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-210	5.0120	d	0.10	0.6136	2.6544E-17	0.0004	0.3890	0.0000
Ac-227	21.770	y	0.01	236.0	6.4354E-18	0.0002	0.0097	0.0000
Po-213	0.42000E-05	s	19.05	9.9898E-13	4.4559E-18	0.0000	0.0000	0.0000
Po-218	3.0980	m	0.26	3.0146E-05	3.0382E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.3343E-04	2.9691E-18	0.0831	0.4240	0.0000
Ra-225	14.800	d	1.35	0.1968	2.8831E-18	0.0137	0.0970	0.0000
Pb-209	3.2530	h	0.43	1.6251E-03	2.5997E-18	0.0001	0.1975	0.0000
At-217	0.32300E-01	s	1.24	3.6130E-09	2.0955E-18	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.0335E-05	1.9329E-18	0.0287	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.81409E+08

Total number of decays = 2.17096E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 1.20130E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21466E-02
Average beta E (MeV) = 0.39420
Average alpha E (MeV) = 2.43938E-08

Composite Exposure Rate Conversion Factor = 0.896389306 R/hr per Ci/m2
Composite ECF per FGR table = 0.980655968 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651832104 Rem/hr per Ci/m2

Actinide Source

Point in time = 19.1409130 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)				
						gamma	beta(-)	beta(+)	alpha	
U-239	23.470	m	0.21	2.8570E+22	3.8007E+08	0.0521	0.3947	0.0000	0.0000	
U-237	6.7500	d	0.15	9.4478E+21	3.0348E+05	0.1440	0.0678	0.0000	0.0000	
U-240	14.100	h	1.42	8.1609E+20	3.0119E+05	0.0073	0.1070	0.0000	0.0000	
Np-239	2.3550	d	0.17	2.7043E+20	2.4899E+04	0.1740	0.1079	0.0000	0.0000	
Np-240	1.0830	h	4.62	2.1297E+17	1023.	1.1900	0.2828	0.0000	0.0000	
U-231	4.2000	d	2.38	1.5689E+18	81.00	0.0824	0.0000	0.0000	0.0002	
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680	
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030	
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140	
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590	
Th-226	30.570	m	0.33	7.5840E+11	7.7460E-03	0.0085	0.0000	0.0000	6.3060	
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130	
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770	
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930	
Ra-222	38.000	s	1.32	2.4525E+09	1.2091E-03	0.0092	0.0000	0.0000	6.5470	
Rn-218	0.35000E-01	s	25.71	2.2476E+06	1.2031E-03	0.0008	0.0000	0.0000	7.1280	
Po-214	0.16370E-03	s	0.12	1.0512E+04	1.2030E-03	0.0002	0.0000	0.0000	7.6870	
Np-240m	7.4000	m	2.70	3.8279E+09	1.6151E-04	0.3148	0.6243	0.0000	0.0000	
Th-231	1.0630	d	0.04	9.0434E+10	1.8446E-05	0.0225	0.0794	0.0000	0.0000	
Pu-239	24111.	y	0.05	8.8308E+15	2.1743E-07	0.0001	0.0000	0.0000	5.1000	
Np-238	2.1170	d	0.09	1.5769E+09	1.6151E-07	0.6470	0.2105	0.0000	0.0000	
Th-228	1.9130	y	0.03	2.6396E+11	8.1911E-08	0.0031	0.0000	0.0000	5.4060	
Np-237	0.21400E+07	y	0.47	2.1493E+17	5.9623E-08	0.0320	0.0000	0.0000	4.7900	
Pu-240	6563.1	y	0.08	3.6259E+14	3.2797E-08	0.0000	0.0000	0.0000	5.1550	
Th-234	24.090	d	0.12	9.3404E+08	8.4069E-09	0.0094	0.0478	0.0000	0.0000	
Pa-231	32771.	y	0.34	5.7364E+13	1.0392E-09	0.0394	0.0000	0.0000	4.9240	
Pa-234m	1.1700	m	2.56	2798.	7.4667E-10	0.0160	0.8101	0.0000	0.0000	
U-235m	26.000	m	7.69	5.1230E+04	6.1521E-10	0.0000	0.0000	0.0000	0.0000	
Pb-210	22.160	y	0.54	2.9146E+08	7.8078E-12	0.0045	0.0061	0.0000	0.0000	
Ra-224	3.6400	d	0.82	2.9004E+04	1.7277E-12	0.0104	0.0000	0.0000	5.6740	
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001	
Th-230	75392.	y	0.40	5.5321E+10	4.3561E-13	0.0004	0.0000	0.0000	4.6640	
Th-229	7339.2	y	2.18	3.7714E+09	3.0506E-13	0.0340	0.0000	0.0000	4.9210	
Pa-233	27.000	d	0.37	2.1113E+04	1.6955E-13	0.2175	0.0664	0.0000	0.0000	
Rn-220	55.800	s	0.54	0.3845	1.2908E-13	0.0006	0.0000	0.0000	6.2880	
Po-216	0.15000	s	3.33	9.9918E-04	1.2479E-13	0.0000	0.0000	0.0000	6.7780	
Pa-232	1.3100	d	1.53	633.2	1.0481E-13	0.9334	0.0935	0.0000	0.0000	
Th-227	18.720	d	0.03	99.12	1.1481E-15	0.1595	0.0000	0.0000	5.8900	
Pu-238	87.712	y	0.34	1.1439E+05	7.7418E-16	0.0018	0.0099	0.0000	5.4860	
Pa-234	6.7810	h	0.44	0.2685	2.0603E-16	1.9000	0.2120	0.0000	0.0000	
Bi-210	5.0120	d	0.10	1.661	7.1845E-17	0.0004	0.3890	0.0000	4.6480	
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000	
Ac-227	21.770	y	0.01	368.1	1.0038E-17	0.0002	0.0097	0.0000	0.0702	
Rn-222	3.8230	d	0.01	7.1486E-02	4.0544E-18	0.0004	0.0000	0.0000	5.4890	
Po-213	0.42000E-05	s	19.05	7.2704E-13	3.2429E-18	0.0000	0.0000	0.0000	8.3760	
Bi-213	45.580	m	0.13	4.5176E-04	3.0946E-18	0.0831	0.4240	0.0000	0.1222	
Ra-225	14.800	d	1.35	0.1966	2.8796E-18	0.0137	0.0970	0.0000	0.0000	
Po-210	138.40	d	0.00	1.803	2.8254E-18	0.0000	0.0000	0.0000	5.3040	
Pb-209	3.2530	h	0.43	1.7056E-03	2.7284E-18	0.0001	0.1975	0.0000	0.0000	
Fr-221	4.9000	m	4.08	2.4352E-05	1.5517E-18	0.0287	0.0000	0.0000	6.3590	

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 84
Total activity (Ci) = 3.80700E+08

Total number of decays = 2.70880E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 1.49891E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21489E-02
Average beta E (MeV) = 0.39419
Average alpha E (MeV) = 2.44880E-08

Composite Exposure Rate Conversion Factor = 0.896423757 R/hr per Ci/m2
Composite ECF per FGR table = 0.980697274 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651860714 Rem/hr per Ci/m2

Actinide Source

Point in time = 23.9051113 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8503E+22	3.7918E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4477E+21	3.0348E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1603E+20	3.0117E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	3.3735E+20	3.1060E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	2.6586E+17	1277.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5689E+18	81.00	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	9.4631E+11	9.6652E-03	0.0085	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Ra-222	38.000	s	1.32	3.7206E+09	1.8342E-03	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	3.4134E+06	1.8270E-03	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.5965E+04	1.8270E-03	0.0002	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.7995E+09	1.6031E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	1.1294E+11	2.3037E-05	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	1.3763E+16	3.3887E-07	0.0001	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5769E+09	1.6150E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	3.2966E+11	1.0230E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.6843E+17	7.4463E-08	0.0320	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.6538E+14	5.1139E-08	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	1.1665E+09	1.0499E-08	0.0094	0.0478	0.0000
Pa-231	32771.	y	0.34	7.1642E+13	1.2978E-09	0.0394	0.0000	0.0000
U-235m	26.000	m	7.69	9.9684E+04	1.1971E-09	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4299.	1.1471E-09	0.0160	0.8101	0.0000
Pb-210	22.160	y	0.54	5.5686E+08	1.4918E-11	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	4.5239E+04	2.6948E-12	0.0104	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Th-230	75392.	y	0.40	6.9091E+10	5.4403E-13	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	4.7101E+09	3.8099E-13	0.0340	0.0000	0.0000
Pa-233	27.000	d	0.37	3.2931E+04	2.6445E-13	0.2175	0.0664	0.0000
Rn-220	55.800	s	0.54	0.7390	2.4812E-13	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.9333E-03	2.4145E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.2	1.0481E-13	0.9334	0.0935	0.0000
Th-227	18.720	d	0.03	99.27	1.1498E-15	0.1595	0.0000	0.0000
Pu-238	87.712	y	0.34	1.4285E+05	9.6686E-16	0.0018	0.0099	0.0000
Pa-234	6.7810	h	0.44	0.5170	3.9678E-16	1.9000	0.2120	0.0000
Bi-210	5.0120	d	0.10	3.384	1.4639E-16	0.0004	0.3890	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Pb-212	10.640	h	0.09	5.6073E-02	2.7424E-17	0.1437	0.0998	0.0000
Ac-227	21.770	y	0.01	573.9	1.5649E-17	0.0002	0.0097	0.0000
Rn-222	3.8230	d	0.01	0.1504	8.5300E-18	0.0004	0.0000	0.0000
Po-218	3.0980	m	0.26	6.3179E-05	6.3675E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.4778E-04	3.0673E-18	0.0831	0.4240	0.0000
Ra-225	14.800	d	1.35	0.2091	3.0637E-18	0.0137	0.0970	0.0000
Po-213	0.42000E-05	s	19.05	6.8180E-13	3.0411E-18	0.0000	0.0000	0.0000
Fr-221	4.9000	m	4.08	4.2473E-05	2.7064E-18	0.0287	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.79816E+08

Total number of decays = 3.37910E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 1.86983E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21517E-02
Average beta E (MeV) = 0.39419
Average alpha E (MeV) = 2.46119E-08

Composite Exposure Rate Conversion Factor = 0.896466672 R/hr per Ci/m2
Composite ECF per FGR table = 0.980748832 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651896298 Rem/hr per Ci/m2

Actinide Source

Point in time = 29.8551559 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8419E+22	3.7807E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4477E+21	3.0348E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1597E+20	3.0114E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	4.2069E+20	3.8733E+04	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	3.3184E+17	1595.	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5689E+18	81.00	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Th-226	30.570	m	0.33	1.1805E+12	1.2057E-02	0.0085	0.0000	0.0000	6.3060
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Ra-222	38.000	s	1.32	5.6084E+09	2.7649E-03	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	5.1497E+06	2.7564E-03	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	2.4086E+04	2.7563E-03	0.0002	0.0000	0.0000	7.6870
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.7644E+09	1.5883E-04	0.3148	0.6243	0.0000	0.0000
Th-231	1.0630	d	0.04	1.4105E+11	2.8770E-05	0.0225	0.0794	0.0000	0.0000
Pu-239	24111.	y	0.05	2.1446E+16	5.2804E-07	0.0001	0.0000	0.0000	5.1000
Np-238	2.1170	d	0.09	1.5768E+09	1.6150E-07	0.6470	0.2105	0.0000	0.0000
Th-228	1.9130	y	0.03	4.1171E+11	1.2776E-07	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.3524E+17	9.2996E-08	0.0320	0.0000	0.0000	4.7900
Pu-240	6563.1	y	0.08	8.8152E+14	7.9735E-08	0.0000	0.0000	0.0000	5.1550
Th-234	24.090	d	0.12	1.4569E+09	1.3113E-08	0.0094	0.0478	0.0000	0.0000
U-235m	26.000	m	7.69	1.9391E+05	2.3286E-09	0.0000	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	6580.	1.7560E-09	0.0160	0.8101	0.0000	0.0000
Pa-231	32771.	y	0.34	8.9473E+13	1.6208E-09	0.0394	0.0000	0.0000	4.9240
Pb-210	22.160	y	0.54	1.0585E+09	2.8355E-11	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400	d	0.82	7.0562E+04	4.2032E-12	0.0104	0.0000	0.0000	5.6740
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Th-230	75392.	y	0.40	8.6285E+10	6.7943E-13	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	5.8824E+09	4.7582E-13	0.0340	0.0000	0.0000	4.9210
Rn-220	55.800	s	0.54	1.414	4.7482E-13	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	3.7217E-03	4.6481E-13	0.0000	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	5.1364E+04	4.1248E-13	0.2175	0.0664	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.2	1.0480E-13	0.9334	0.0935	0.0000	0.0000
Pu-238	87.712	y	0.34	1.7841E+05	1.2075E-15	0.0018	0.0099	0.0000	5.4860
Th-227	18.720	d	0.03	99.40	1.1513E-15	0.1595	0.0000	0.0000	5.8900
Pa-234	6.7810	h	0.44	0.9930	7.6206E-16	1.9000	0.2120	0.0000	0.0000
Bi-210	5.0120	d	0.10	8.078	3.4946E-16	0.0004	0.3890	0.0000	4.6480
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Pb-212	10.640	h	0.09	5.9262E-02	2.8984E-17	0.1437	0.0998	0.0000	0.0000
Ac-227	21.770	y	0.01	895.3	2.4412E-17	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	0.3188	4.6703E-18	0.0137	0.0970	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	8.5367E-13	3.8077E-18	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.9129E-03	3.0601E-18	0.0001	0.1975	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1377E-04	2.8344E-18	0.0831	0.4240	0.0000	0.1222
At-217	0.32300E-01	s	1.24	4.5724E-09	2.6519E-18	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	3.1716E-05	2.0209E-18	0.0287	0.0000	0.0000	6.3590

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.78715E+08

Total number of decays = 4.21406E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 2.33185E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21553E-02
Average beta E (MeV) = 0.39418
Average alpha E (MeV) = 2.47757E-08

Composite Exposure Rate Conversion Factor = 0.896520674 R/hr per Ci/m2
Composite ECF per FGR table = 0.980813622 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651941061 Rem/hr per Ci/m2

Actinide Source

Point in time = 37.2861481 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8316E+22	3.7669E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4476E+21	3.0348E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1588E+20	3.0111E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	5.2444E+20	4.8285E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	4.1414E+17	1990.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5689E+18	80.99	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	1.4723E+12	1.5037E-02	0.0085	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Ra-222	38.000	s	1.32	8.3897E+09	4.1361E-03	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	7.7086E+06	4.1260E-03	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	3.6054E+04	4.1260E-03	0.0002	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.7210E+09	1.5700E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	1.7615E+11	3.5930E-05	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	3.3410E+16	8.2261E-07	0.0001	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5768E+09	1.6150E-07	0.6470	0.2105	0.0000
Th-228	1.9130	y	0.03	5.1419E+11	1.5956E-07	0.0031	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.3743E+15	1.2431E-07	0.0000	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	4.1868E+17	1.1614E-07	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	1.8195E+09	1.6376E-08	0.0094	0.0478	0.0000
U-235m	26.000	m	7.69	3.7708E+05	4.5282E-09	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.0029E+04	2.6763E-09	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.1174E+14	2.0242E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	1.9996E+09	5.3566E-11	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	1.1006E+05	6.5560E-12	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	2.696	9.0504E-13	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	7.1254E-03	8.8991E-13	0.0000	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Th-230	75392.	y	0.40	1.0776E+11	8.4854E-13	0.0004	0.0000	0.0000
Pa-233	27.000	d	0.37	8.0115E+04	6.4337E-13	0.2175	0.0664	0.0000
Th-229	7339.2	y	2.18	7.3466E+09	5.9425E-13	0.0340	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.2	1.0480E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	2.2281E+05	1.5080E-15	0.0018	0.0099	0.0000
Pa-234	6.7810	h	0.44	1.901	1.4587E-15	1.9000	0.2120	0.0000
Th-227	18.720	d	0.03	99.43	1.1516E-15	0.1595	0.0000	0.0000
Bi-210	5.0120	d	0.10	19.11	8.2677E-16	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	0.2819	1.3789E-16	0.1437	0.0998	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Ac-227	21.770	y	0.01	1511.	4.1196E-17	0.0002	0.0097	0.0000
Ra-223	11.430	d	0.17	1.785	3.3861E-17	0.1351	0.0000	0.0000
Ra-225	14.800	d	1.35	0.4536	6.6451E-18	0.0137	0.0970	0.0000
Po-215	0.17800E-02	s	0.56	3.1661E-10	3.3321E-18	0.0000	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	6.8580E-13	3.0589E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.1046E-04	2.8117E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	4.4645E-09	2.5894E-18	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.77345E+08

Total number of decays = 5.25344E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 2.90699E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21598E-02
Average beta E (MeV) = 0.39417
Average alpha E (MeV) = 2.49930E-08

Composite Exposure Rate Conversion Factor = 0.896588206 R/hr per Ci/m2
Composite ECF per FGR table = 0.980894804 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.651997089 Rem/hr per Ci/m2

Actinide Source

Point in time = 46.5667229 sec

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8186E+22	3.7497E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4475E+21	3.0347E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1578E+20	3.0108E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	6.5348E+20	6.0166E+04	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	5.1677E+17	2483.	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5689E+18	80.99	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Th-226	30.570	m	0.33	1.8355E+12	1.8747E-02	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	1.2436E+10	6.1309E-03	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.1433E+07	6.1193E-03	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	5.3472E+04	6.1193E-03	0.0002	0.0000	0.0000	7.6870
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-240m	7.4000	m	2.70	3.6675E+09	1.5474E-04	0.3148	0.6243	0.0000	0.0000
Th-231	1.0630	d	0.04	2.1999E+11	4.4872E-05	0.0225	0.0794	0.0000	0.0000
Pu-239	24111.	y	0.05	5.2031E+16	1.2811E-06	0.0001	0.0000	0.0000	5.1000
Th-228	1.9130	y	0.03	6.4217E+11	1.9928E-07	0.0031	0.0000	0.0000	5.4060
Pu-240	6563.1	y	0.08	2.1423E+15	1.9377E-07	0.0000	0.0000	0.0000	5.1550
Np-238	2.1170	d	0.09	1.5767E+09	1.6149E-07	0.6470	0.2105	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	5.2289E+17	1.4505E-07	0.0320	0.0000	0.0000	4.7900
Th-234	24.090	d	0.12	2.2723E+09	2.0453E-08	0.0094	0.0478	0.0000	0.0000
U-235m	26.000	m	7.69	7.3294E+05	8.8017E-09	0.0000	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.5203E+04	4.0571E-09	0.0160	0.8101	0.0000	0.0000
Pa-231	32771.	y	0.34	1.3955E+14	2.5280E-09	0.0394	0.0000	0.0000	4.9240
Pb-210	22.160	y	0.54	3.7503E+09	1.0047E-10	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.7167E+05	1.0226E-11	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	5.113	1.7166E-12	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1.3562E-02	1.6938E-12	0.0000	0.0000	0.0000	6.7780
Th-230	75392.	y	0.40	1.3459E+11	1.0598E-12	0.0004	0.0000	0.0000	4.6640
Pa-233	27.000	d	0.37	1.2496E+05	1.0035E-12	0.2175	0.0664	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Th-229	7339.2	y	2.18	9.1752E+09	7.4216E-13	0.0340	0.0000	0.0000	4.9210
Pa-232	1.3100	d	1.53	633.1	1.0479E-13	0.9334	0.0935	0.0000	0.0000
Pa-234	6.7810	h	0.44	3.624	2.7808E-15	1.9000	0.2120	0.0000	0.0000
Bi-210	5.0120	d	0.10	45.04	1.9484E-15	0.0004	0.3890	0.0000	4.6480
Pu-238	87.712	y	0.34	2.7827E+05	1.8833E-15	0.0018	0.0099	0.0000	5.4860
Th-227	18.720	d	0.03	99.02	1.1468E-15	0.1595	0.0000	0.0000	5.8900
Pb-212	10.640	h	0.09	0.6994	3.4206E-16	0.1437	0.0998	0.0000	0.0000
Ac-227	21.770	y	0.01	2178.	5.9387E-17	0.0002	0.0097	0.0000	0.0702
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Ra-225	14.800	d	1.35	0.7699	1.1280E-17	0.0137	0.0970	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	7.6983E-13	3.4338E-18	0.0000	0.0000	0.0000	8.3760
Tl-207	4.7700	m	0.63	4.7113E-05	3.0839E-18	0.0029	0.4953	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.6703E-05	2.3387E-18	0.0287	0.0000	0.0000	6.3590
Pb-209	3.2530	h	0.43	1.4577E-03	2.3318E-18	0.0001	0.1975	0.0000	0.0000
Bi-213	45.580	m	0.13	2.8159E-04	1.9290E-18	0.0831	0.4240	0.0000	0.1222

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.75640E+08

Total number of decays = 6.54624E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 3.62236E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21654E-02
Average beta E (MeV) = 0.39416
Average alpha E (MeV) = 2.52820E-08

Composite Exposure Rate Conversion Factor = 0.896672964 R/hr per Ci/m2
Composite ECF per FGR table = 0.980996490 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652067363 Rem/hr per Ci/m2

Actinide Source

Point in time = 58.1572990 sec

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.8026E+22	3.7284E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4473E+21	3.0347E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1565E+20	3.0103E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	8.1380E+20	7.4926E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	6.4468E+17	3098.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5688E+18	80.99	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	2.2874E+12	2.3363E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	1.8237E+10	8.9908E-03	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.6773E+07	8.9775E-03	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	7.8447E+04	8.9775E-03	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.6017E+09	1.5197E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	2.7473E+11	5.6038E-05	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	8.1001E+16	1.9944E-06	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.3390E+15	3.0202E-07	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	8.0201E+11	2.4888E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	6.5304E+17	1.8115E-07	0.0320	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5767E+09	1.6148E-07	0.6470	0.2105	0.0000
Th-234	24.090	d	0.12	2.8379E+09	2.5543E-08	0.0094	0.0478	0.0000
U-235m	26.000	m	7.69	1.4239E+06	1.7099E-08	0.0000	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.2898E+04	6.1106E-09	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.7429E+14	3.1573E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	6.9742E+09	1.8683E-10	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	2.6776E+05	1.5950E-11	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	9.640	3.2365E-12	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	2.5642E-02	3.2024E-12	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	1.9490E+05	1.5652E-12	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	1.6808E+11	1.3235E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.1459E+10	9.2688E-13	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.1	1.0478E-13	0.9334	0.0935	0.0000
Pa-234	6.7810	h	0.44	6.874	5.2749E-15	1.9000	0.2120	0.0000
Bi-210	5.0120	d	0.10	105.6	4.5705E-15	0.0004	0.3890	0.0000
Pu-238	87.712	y	0.34	3.4752E+05	2.3521E-15	0.0018	0.0099	0.0000
Th-227	18.720	d	0.03	100.5	1.1636E-15	0.1595	0.0000	0.0000
Pb-212	10.640	h	0.09	1.750	8.5567E-16	0.1437	0.0998	0.0000
Ac-227	21.770	y	0.01	3397.	9.2628E-17	0.0002	0.0097	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Ra-223	11.430	d	0.17	0.8115	1.5393E-17	0.1351	0.0000	0.0000
Ra-225	14.800	d	1.35	1.025	1.5021E-17	0.0137	0.0970	0.0000
Pb-211	36.100	m	0.55	1.5944E-03	1.3790E-17	0.0637	0.4455	0.0000
Tl-207	4.7700	m	0.63	9.6598E-05	6.3230E-18	0.0029	0.4953	0.0000
Po-215	0.17800E-02	s	0.56	4.4057E-10	4.6368E-18	0.0000	0.0000	0.0000
Po-218	3.0980	m	0.26	4.1019E-05	4.1340E-18	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.73523E+08

Total number of decays = 8.15264E+20
Asympt number of decays = 1.80717E+27
Percent of decays = 4.51126E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21725E-02
Average beta E (MeV) = 0.39414
Average alpha E (MeV) = 2.56667E-08

Composite Exposure Rate Conversion Factor = 0.896779537 R/hr per Ci/m2
Composite ECF per FGR table = 0.981124461 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652155757 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.21054566 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.7827E+22	3.7019E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4472E+21	3.0346E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1549E+20	3.0097E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.0127E+21	9.3242E+04	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	8.0402E+17	3863.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5688E+18	80.99	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	2.8490E+12	2.9098E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	2.6413E+10	1.3021E-02	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.4300E+07	1.3006E-02	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.1365E+05	1.3006E-02	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.5212E+09	1.4857E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	3.4309E+11	6.9982E-05	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	1.2604E+17	3.1034E-06	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.2032E+15	4.7064E-07	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	1.0016E+12	3.1082E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	8.1557E+17	2.2624E-07	0.0320	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5766E+09	1.6147E-07	0.6470	0.2105	0.0000
U-235m	26.000	m	7.69	2.7643E+06	3.3196E-08	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	3.5443E+09	3.1901E-08	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.4221E+04	9.1322E-09	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	2.1766E+14	3.9430E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	1.2841E+10	3.4400E-10	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	4.1763E+05	2.4877E-11	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	18.05	6.0582E-12	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	4.8104E-02	6.0078E-12	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	3.0400E+05	2.4413E-12	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	2.0992E+11	1.6530E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.4311E+10	1.1576E-12	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	633.0	1.0477E-13	0.9334	0.0935	0.0000
Bi-210	5.0120	d	0.10	245.0	1.0600E-14	0.0004	0.3890	0.0000
Pa-234	6.7810	h	0.44	12.96	9.9461E-15	1.9000	0.2120	0.0000
Pu-238	87.712	y	0.34	4.3401E+05	2.9374E-15	0.0018	0.0099	0.0000
Pb-212	10.640	h	0.09	4.135	2.0224E-15	0.1437	0.0998	0.0000
Th-227	18.720	d	0.03	99.49	1.1524E-15	0.1595	0.0000	0.0000
Ac-227	21.770	y	0.01	5298.	1.4448E-16	0.0002	0.0097	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Ra-225	14.800	d	1.35	1.631	2.3890E-17	0.0137	0.0970	0.0000
Ra-223	11.430	d	0.17	0.6663	1.2640E-17	0.1351	0.0000	0.0000
Tl-207	4.7700	m	0.63	1.9109E-04	1.2508E-17	0.0029	0.4953	0.0000
Bi-213	45.580	m	0.13	4.5252E-04	3.0998E-18	0.0831	0.4240	0.0000
Po-213	0.42000E-05	s	19.05	5.9268E-13	2.6436E-18	0.0000	0.0000	0.0000
At-217	0.32300E-01	s	1.24	4.4675E-09	2.5911E-18	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 3.70894E+08

Total number of decays = 1.01461E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 5.61437E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21813E-02
Average beta E (MeV) = 0.39413
Average alpha E (MeV) = 2.61781E-08

Composite Exposure Rate Conversion Factor = 0.896913528 R/hr per Ci/m2
Composite ECF per FGR table = 0.981285393 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652266741 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.51185203 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.7581E+22	3.6691E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4470E+21	3.0346E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1529E+20	3.0089E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.2592E+21	1.1593E+05	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.0024E+18	4817.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5687E+18	80.99	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	3.5460E+12	3.6217E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	3.7715E+10	1.8593E-02	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	3.4707E+07	1.8577E-02	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.6233E+05	1.8577E-02	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.4232E+09	1.4444E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	4.2846E+11	8.7395E-05	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	1.9601E+17	4.8262E-06	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.1064E+15	7.3324E-07	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	1.2509E+12	3.8819E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.0186E+18	2.8255E-07	0.0320	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5765E+09	1.6146E-07	0.6470	0.2105	0.0000
U-235m	26.000	m	7.69	5.3621E+06	6.4392E-08	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	4.4265E+09	3.9841E-08	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	5.0673E+04	1.3523E-08	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	2.7184E+14	4.9244E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	2.3376E+10	6.2621E-10	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	6.5139E+05	3.8802E-11	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	33.49	1.1245E-11	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	8.9444E-02	1.1171E-11	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	4.7416E+05	3.8078E-12	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	2.6217E+11	2.0644E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.7873E+10	1.4457E-12	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	632.9	1.0476E-13	0.9334	0.0935	0.0000
Bi-210	5.0120	d	0.10	563.9	2.4396E-14	0.0004	0.3890	0.0000
Pa-234	6.7810	h	0.44	24.26	1.8620E-14	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	9.857	4.8209E-15	0.1437	0.0998	0.0000
Pu-238	87.712	y	0.34	5.4201E+05	3.6684E-15	0.0018	0.0099	0.0000
Th-227	18.720	d	0.03	99.32	1.1504E-15	0.1595	0.0000	0.0000
Ac-227	21.770	y	0.01	8264.	2.2535E-16	0.0002	0.0097	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Ra-225	14.800	d	1.35	2.509	3.6760E-17	0.0137	0.0970	0.0000
Ra-223	11.430	d	0.17	0.2914	5.5279E-18	0.1351	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	9.4926E-13	4.2341E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	1.9750E-03	3.1594E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	4.5745E-04	3.1336E-18	0.0831	0.4240	0.0000
Ac-225	10.000	d	1.00	0.1198	2.5978E-18	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.67638E+08

Total number of decays = 1.26162E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 6.98115E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.21925E-02
Average beta E (MeV) = 0.39410
Average alpha E (MeV) = 2.68557E-08

Composite Exposure Rate Conversion Factor = 0.897082567 R/hr per Ci/m2
Composite ECF per FGR table = 0.981488228 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652406812 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.88815582 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.7276E+22	3.6286E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4467E+21	3.0345E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1504E+20	3.0080E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.5639E+21	1.4399E+05	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.2492E+18	6003.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5687E+18	80.98	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0310E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	4.4098E+12	4.5040E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	5.3015E+10	2.6136E-02	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	4.8797E+07	2.6118E-02	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2.2823E+05	2.6118E-02	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Np-240m	7.4000	m	2.70	3.3047E+09	1.3943E-04	0.3148	0.6243	0.0000
Th-231	1.0630	d	0.04	5.3506E+11	1.0914E-04	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	3.0460E+17	7.4999E-06	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.2626E+16	1.1420E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	1.5623E+12	4.8481E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.2721E+18	3.5287E-07	0.0320	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5763E+09	1.6145E-07	0.6470	0.2105	0.0000
U-235m	26.000	m	7.69	1.0390E+07	1.2477E-07	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	5.5282E+09	4.9757E-08	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	7.4231E+04	1.9810E-08	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	3.3949E+14	6.1499E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	4.2008E+10	1.1253E-09	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	1.0160E+06	6.0520E-11	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	61.56	2.0666E-11	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	0.1646	2.0559E-11	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	7.3957E+05	5.9392E-12	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	3.2742E+11	2.5782E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.2322E+10	1.8056E-12	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	632.9	1.0475E-13	0.9334	0.0935	0.0000
Bi-210	5.0120	d	0.10	1284.	5.5537E-14	0.0004	0.3890	0.0000
Pa-234	6.7810	h	0.44	45.04	3.4565E-14	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	22.72	1.1111E-14	0.1437	0.0998	0.0000
Pu-238	87.712	y	0.34	6.7689E+05	4.5813E-15	0.0018	0.0099	0.0000
Th-227	18.720	d	0.03	99.13	1.1482E-15	0.1595	0.0000	0.0000
Ac-227	21.770	y	0.01	1.2890E+04	3.5149E-16	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	3.858	5.6526E-17	0.0137	0.0970	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Po-213	0.42000E-05	s	19.05	7.9245E-13	3.5347E-18	0.0000	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.1502E-03	3.4396E-18	0.0001	0.1975	0.0000
Bi-213	45.580	m	0.13	4.6366E-04	3.1761E-18	0.0831	0.4240	0.0000
Po-218	3.0980	m	0.26	2.9858E-05	3.0093E-18	0.0000	0.0000	0.0000
At-217	0.32300E-01	s	1.24	4.1801E-09	2.4244E-18	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.63612E+08

Total number of decays = 1.56705E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 8.67129E-05
Average chain length = 11.185

Average gamma E (MeV) = 5.22067E-02
Average beta E (MeV) = 0.39407
Average alpha E (MeV) = 2.77490E-08

Composite Exposure Rate Conversion Factor = 0.897296190 R/hr per Ci/m2
Composite ECF per FGR table = 0.981744528 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652583659 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.35812044 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.6900E+22	3.5786E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4464E+21	3.0344E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1472E+20	3.0069E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	1.9397E+21	1.7859E+05	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.5560E+18	7476.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5686E+18	80.98	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0309E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	5.4784E+12	5.5954E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	7.3273E+10	3.6123E-02	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	6.7454E+07	3.6105E-02	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	3.1549E+05	3.6105E-02	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-231	1.0630	d	0.04	6.6816E+11	1.3629E-04	0.0225	0.0794	0.0000
Np-240m	7.4000	m	2.70	3.1623E+09	1.3343E-04	0.3148	0.6243	0.0000
Pu-239	24111.	y	0.05	4.7292E+17	1.1644E-05	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.9658E+16	1.7781E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	1.9512E+12	6.0548E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.5887E+18	4.4069E-07	0.0320	0.0000	0.0000
U-235m	26.000	m	7.69	2.0107E+07	2.4146E-07	0.0000	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5762E+09	1.6143E-07	0.6470	0.2105	0.0000
Th-234	24.090	d	0.12	6.9041E+09	6.2142E-08	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.0740E+05	2.8662E-08	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	4.2398E+14	7.6805E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	7.4426E+10	1.9938E-09	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	1.5847E+06	9.4395E-11	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	111.9	3.7556E-11	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	0.2995	3.7403E-11	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	1.1535E+06	9.2635E-12	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	4.0892E+11	3.2199E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	2.7878E+10	2.2550E-12	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Bi-210	5.0120	d	0.10	2886.	1.2487E-13	0.0004	0.3890	0.0000
Pa-232	1.3100	d	1.53	632.8	1.0473E-13	0.9334	0.0935	0.0000
Pa-234	6.7810	h	0.44	82.79	6.3535E-14	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	52.49	2.5670E-14	0.1437	0.0998	0.0000
Pu-238	87.712	y	0.34	8.4532E+05	5.7213E-15	0.0018	0.0099	0.0000
Th-227	18.720	d	0.03	98.63	1.1424E-15	0.1595	0.0000	0.0000
Ac-227	21.770	y	0.01	2.0105E+04	5.4822E-16	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	5.957	8.7276E-17	0.0137	0.0970	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Bi-212	1.0090	h	0.10	7.6561E-03	3.9485E-17	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	3.9965E-13	2.5124E-17	0.0000	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	8.2883E-13	3.6969E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	4.0520E-04	2.7756E-18	0.0831	0.4240	0.0000
At-217	0.32300E-01	s	1.24	3.8388E-09	2.2265E-18	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 3.58647E+08

Total number of decays = 1.94382E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 1.07561E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.22246E-02
Average beta E (MeV) = 0.39404
Average alpha E (MeV) = 2.89198E-08

Composite Exposure Rate Conversion Factor = 0.897566915 R/hr per Ci/m2
Composite ECF per FGR table = 0.982069373 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.652807713 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.94506025 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.6438E+22	3.5171E+08	0.0521	0.3947	0.0000
U-237	6.7500	d	0.15	9.4460E+21	3.0343E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1433E+20	3.0054E+05	0.0073	0.1070	0.0000
Np-239	2.3550	d	0.17	2.4017E+21	2.2113E+05	0.1740	0.1079	0.0000
Np-240	1.0830	h	4.62	1.9367E+18	9306.	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5685E+18	80.97	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0309E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-226	30.570	m	0.33	6.7970E+12	6.9422E-02	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	9.9515E+10	4.9060E-02	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	9.1623E+07	4.9041E-02	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	4.2853E+05	4.9041E-02	0.0002	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-231	1.0630	d	0.04	8.3436E+11	1.7019E-04	0.0225	0.0794	0.0000
Np-240m	7.4000	m	2.70	2.9932E+09	1.2629E-04	0.3148	0.6243	0.0000
Pu-239	24111.	y	0.05	7.3342E+17	1.8058E-05	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.0593E+16	2.7672E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	2.4368E+12	7.5618E-07	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.9840E+18	5.5037E-07	0.0320	0.0000	0.0000
U-235m	26.000	m	7.69	3.8848E+07	4.6652E-07	0.0000	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5759E+09	1.6141E-07	0.6470	0.2105	0.0000
Th-234	24.090	d	0.12	8.6225E+09	7.7608E-08	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.5326E+05	4.0898E-08	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	5.2949E+14	9.5918E-09	0.0394	0.0000	0.0000
Pb-210	22.160	y	0.54	1.2986E+11	3.4788E-09	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	2.4716E+06	1.4723E-10	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	200.7	6.7392E-11	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	0.5379	6.7177E-11	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	1.7992E+06	1.4449E-11	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	5.1070E+11	4.0214E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	3.4816E+10	2.8162E-12	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000
Bi-210	5.0120	d	0.10	6403.	2.7698E-13	0.0004	0.3890	0.0000
Pa-234	6.7810	h	0.44	150.5	1.1547E-13	1.9000	0.2120	0.0000
Pa-232	1.3100	d	1.53	632.6	1.0471E-13	0.9334	0.0935	0.0000
Pb-212	10.640	h	0.09	119.4	5.8399E-14	0.1437	0.0998	0.0000
Pu-238	87.712	y	0.34	1.0557E+06	7.1449E-15	0.0018	0.0099	0.0000
Th-227	18.720	d	0.03	98.63	1.1424E-15	0.1595	0.0000	0.0000
Ac-227	21.770	y	0.01	3.1358E+04	8.5508E-16	0.0002	0.0097	0.0000
Bi-212	1.0090	h	0.10	4.8613E-02	2.5072E-16	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	3.2908E-12	2.0688E-16	0.0000	0.0000	0.0000
Ra-225	14.800	d	1.35	9.252	1.3554E-16	0.0137	0.0970	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
At-217	0.32300E-01	s	1.24	5.0956E-09	2.9554E-18	0.0002	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	6.0839E-13	2.7137E-18	0.0000	0.0000	0.0000
Bi-213	45.580	m	0.13	3.2890E-04	2.2530E-18	0.0831	0.4240	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.52541E+08

Total number of decays = 2.40715E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 1.33200E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.22474E-02
Average beta E (MeV) = 0.39399
Average alpha E (MeV) = 3.04453E-08

Composite Exposure Rate Conversion Factor = 0.897911251 R/hr per Ci/m2
Composite ECF per FGR table = 0.982482314 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.653092623 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.67809343 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.5871E+22	3.4417E+08	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.4455E+21	3.0341E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.1384E+20	3.0036E+05	0.0073	0.1070	0.0000	0.0000
Np-239	2.3550	d	0.17	2.9675E+21	2.7322E+05	0.1740	0.1079	0.0000	0.0000
Np-240	1.0830	h	4.62	2.4087E+18	1.1574E+04	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5683E+18	80.97	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0309E+17	1.075	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-226	30.570	m	0.33	8.4194E+12	8.5992E-02	0.0085	0.0000	0.0000	6.3060
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Ra-222	38.000	s	1.32	1.3282E+11	6.5481E-02	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.2230E+08	6.5462E-02	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	5.7203E+05	6.5462E-02	0.0002	0.0000	0.0000	7.6870
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-231	1.0630	d	0.04	1.0419E+12	2.1251E-04	0.0225	0.0794	0.0000	0.0000
Np-240m	7.4000	m	2.70	2.7946E+09	1.1791E-04	0.3148	0.6243	0.0000	0.0000
Pu-239	24111.	y	0.05	1.1358E+18	2.7966E-05	0.0001	0.0000	0.0000	5.1000
Pu-240	6563.1	y	0.08	4.7585E+16	4.3041E-06	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	3.0433E+12	9.4439E-07	0.0031	0.0000	0.0000	5.4060
U-235m	26.000	m	7.69	7.4904E+07	8.9951E-07	0.0000	0.0000	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.4778E+18	6.8734E-07	0.0320	0.0000	0.0000	4.7900
Np-238	2.1170	d	0.09	1.5757E+09	1.6138E-07	0.6470	0.2105	0.0000	0.0000
Th-234	24.090	d	0.12	1.0769E+10	9.6925E-08	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.1538E+05	5.7477E-08	0.0160	0.8101	0.0000	0.0000
Pa-231	32771.	y	0.34	6.6125E+14	1.1979E-08	0.0394	0.0000	0.0000	4.9240
Pb-210	22.160	y	0.54	2.2301E+11	5.9742E-09	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400	d	0.82	3.8550E+06	2.2963E-10	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	355.3	1.1928E-10	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	0.9527	1.1898E-10	0.0000	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	2.8062E+06	2.2536E-11	0.2175	0.0664	0.0000	0.0000
Th-230	75392.	y	0.40	6.3782E+11	5.0223E-12	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	4.3482E+10	3.5172E-12	0.0340	0.0000	0.0000	4.9210
Np-235	1.0840	y	0.28	1.6190E+06	8.8662E-13	0.0001	0.0000	0.0000	0.0001
Bi-210	5.0120	d	0.10	1.3996E+04	6.0550E-13	0.0004	0.3890	0.0000	4.6480
Pa-234	6.7810	h	0.44	270.0	2.0723E-13	1.9000	0.2120	0.0000	0.0000
Pb-212	10.640	h	0.09	268.6	1.3137E-13	0.1437	0.0998	0.0000	0.0000
Pa-232	1.3100	d	1.53	632.4	1.0468E-13	0.9334	0.0935	0.0000	0.0000
Pu-238	87.712	y	0.34	1.3183E+06	8.9225E-15	0.0018	0.0099	0.0000	5.4860
Ac-227	21.770	y	0.01	4.8909E+04	1.3337E-15	0.0002	0.0097	0.0000	0.0702
Th-227	18.720	d	0.03	100.8	1.1680E-15	0.1595	0.0000	0.0000	5.8900
Bi-212	1.0090	h	0.10	0.2069	1.0669E-15	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	1.0812E-11	6.7969E-16	0.0000	0.0000	0.0000	8.7850
Ra-225	14.800	d	1.35	14.43	2.1142E-16	0.0137	0.0970	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000
Tl-208	3.0530	m	0.13	4.1413E-04	4.2353E-17	3.3800	0.5598	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	9.6153E-13	4.2888E-18	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.8945E-03	3.0306E-18	0.0001	0.1975	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.45063E+08

Total number of decays = 2.97475E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 1.64608E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.22765E-02
Average beta E (MeV) = 0.39393
Average alpha E (MeV) = 3.24244E-08

Composite Exposure Rate Conversion Factor = 0.898351312 R/hr per Ci/m2
Composite ECF per FGR table = 0.983009875 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.653456330 Rem/hr per Ci/m2

Actinide Source

Point in time = 4.59357548 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.5181E+22	3.3499E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	3.6570E+21	3.3670E+05	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4449E+21	3.0339E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1323E+20	3.0014E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	2.9925E+18	1.4379E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5682E+18	80.96	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0309E+17	1.075	0.0029	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
Th-226	30.570	m	0.33	1.0408E+13	0.1063	0.0085	0.0000	6.3060
Ra-222	38.000	s	1.32	1.7437E+11	8.5965E-02	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.6057E+08	8.5946E-02	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	7.5102E+05	8.5946E-02	0.0002	0.0000	7.6870
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Th-231	1.0630	d	0.04	1.3009E+12	2.6535E-04	0.0225	0.0794	0.0000
Np-240m	7.4000	m	2.70	2.5649E+09	1.0822E-04	0.3148	0.6243	0.0000
Pu-239	24111.	y	0.05	1.7559E+18	4.3233E-05	0.0001	0.0000	5.1000
Pu-240	6563.1	y	0.08	7.3962E+16	6.6900E-06	0.0000	0.0000	5.1550
U-235m	26.000	m	7.69	1.4406E+08	1.7300E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	3.8008E+12	1.1795E-06	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.0944E+18	8.5839E-07	0.0320	0.0000	4.7900
Np-238	2.1170	d	0.09	1.5754E+09	1.6135E-07	0.6470	0.2105	0.0000
Th-234	24.090	d	0.12	1.3449E+10	1.2105E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	2.9789E+05	7.9495E-08	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	8.2580E+14	1.4960E-08	0.0394	0.0000	4.9240
Pb-210	22.160	y	0.54	3.7690E+11	1.0097E-08	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	6.0127E+06	3.5816E-10	0.0104	0.0000	5.6740
Rn-220	55.800	s	0.54	619.7	2.0806E-10	0.0006	0.0000	6.2880
Po-216	0.15000	s	3.33	1.663	2.0766E-10	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	4.3769E+06	3.5149E-11	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	7.9657E+11	6.2723E-12	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	5.4305E+10	4.3926E-12	0.0340	0.0000	4.9210
Bi-210	5.0120	d	0.10	3.0137E+04	1.3038E-12	0.0004	0.3890	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8661E-13	0.0001	0.0000	0.0001
Pa-234	6.7810	h	0.44	478.0	3.6679E-13	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	595.4	2.9119E-13	0.1437	0.0998	0.0000
Pa-232	1.3100	d	1.53	632.2	1.0464E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	1.6463E+06	1.1142E-14	0.0018	0.0099	5.4860
Bi-212	1.0090	h	0.10	0.6186	3.1903E-15	0.1040	0.3164	2.1750
Ac-227	21.770	y	0.01	7.6283E+04	2.0801E-15	0.0002	0.0097	0.0702
Po-212	0.29800E-06	s	1.01	3.2536E-11	2.0454E-15	0.0000	0.0000	8.7850
Th-227	18.720	d	0.03	98.87	1.1452E-15	0.1595	0.0000	5.8900
Ra-225	14.800	d	1.35	22.48	3.2938E-16	0.0137	0.0970	0.0000
Tl-208	3.0530	m	0.13	1.8561E-03	1.8983E-16	3.3800	0.5598	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Rn-222	3.8230	d	0.01	0.1454	8.2491E-18	0.0004	0.0000	5.4890
Tl-207	4.7700	m	0.63	1.1573E-04	7.5753E-18	0.0029	0.4953	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 84
Total activity (Ci) = 3.35948E+08

Total number of decays = 3.66674E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 2.02899E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.23139E-02
Average beta E (MeV) = 0.39386
Average alpha E (MeV) = 3.49877E-08

Composite Exposure Rate Conversion Factor = 0.898916602 R/hr per Ci/m2
Composite ECF per FGR table = 0.983687341 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.653923213 Rem/hr per Ci/m2

Actinide Source

Point in time = 5.73692894 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.4345E+22	3.2387E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	4.4921E+21	4.1359E+05	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4441E+21	3.0337E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1247E+20	2.9985E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	3.7131E+18	1.7841E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5680E+18	80.95	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0309E+17	1.075	0.0029	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
Th-226	30.570	m	0.33	1.2834E+13	0.1311	0.0085	0.0000	6.3060
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
Ra-222	38.000	s	1.32	2.2549E+11	0.1112	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	2.0765E+08	0.1111	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	9.7122E+05	0.1111	0.0002	0.0000	7.6870
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Th-231	1.0630	d	0.04	1.6243E+12	3.3132E-04	0.0225	0.0794	0.0000
Np-240m	7.4000	m	2.70	2.3044E+09	9.7230E-05	0.3148	0.6243	0.0000
Pu-239	24111.	y	0.05	2.7086E+18	6.6692E-05	0.0001	0.0000	5.1000
Pu-240	6563.1	y	0.08	1.1486E+17	1.0390E-05	0.0000	0.0000	5.1550
U-235m	26.000	m	7.69	2.7621E+08	3.3169E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	4.7468E+12	1.4730E-06	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.8645E+18	1.0720E-06	0.0320	0.0000	4.7900
Np-238	2.1170	d	0.09	1.5749E+09	1.6131E-07	0.6470	0.2105	0.0000
Th-234	24.090	d	0.12	1.6796E+10	1.5118E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	4.0539E+05	1.0818E-07	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.0313E+15	1.8682E-08	0.0394	0.0000	4.9240
Pb-210	22.160	y	0.54	6.2715E+11	1.6800E-08	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	9.3778E+06	5.5861E-10	0.0104	0.0000	5.6740
Rn-220	55.800	s	0.54	1065.	3.5760E-10	0.0006	0.0000	6.2880
Po-216	0.15000	s	3.33	2.859	3.5706E-10	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	6.8267E+06	5.4823E-11	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	9.9484E+11	7.8336E-12	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	6.7822E+10	5.4859E-12	0.0340	0.0000	4.9210
Bi-210	5.0120	d	0.10	6.3905E+04	2.7646E-12	0.0004	0.3890	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8661E-13	0.0001	0.0000	0.0001
Pa-234	6.7810	h	0.44	833.7	6.3977E-13	1.9000	0.2120	0.0000
Pb-212	10.640	h	0.09	1302.	6.3669E-13	0.1437	0.0998	0.0000
Pa-232	1.3100	d	1.53	632.0	1.0460E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	2.0557E+06	1.3914E-14	0.0018	0.0099	5.4860
Bi-212	1.0090	h	0.10	1.747	9.0081E-15	0.1040	0.3164	2.1750
Po-212	0.29800E-06	s	1.01	9.1377E-11	5.7444E-15	0.0000	0.0000	8.7850
Ac-227	21.770	y	0.01	1.1898E+05	3.2443E-15	0.0002	0.0097	0.0702
Th-227	18.720	d	0.03	98.64	1.1425E-15	0.1595	0.0000	5.8900
Tl-208	3.0530	m	0.13	5.9227E-03	6.0571E-16	3.3800	0.5598	0.0000
Ra-225	14.800	d	1.35	35.00	5.1273E-16	0.0137	0.0970	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Ra-223	11.430	d	0.17	1.037	1.9672E-17	0.1351	0.0000	5.6640
Po-210	138.40	d	0.00	7.808	1.2233E-17	0.0000	0.0000	5.3040

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.24906E+08

Total number of decays = 4.50537E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 2.49305E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.23621E-02
Average beta E (MeV) = 0.39376
Average alpha E (MeV) = 3.83146E-08

Composite Exposure Rate Conversion Factor = 0.899648070 R/hr per Ci/m2
Composite ECF per FGR table = 0.984563410 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.654526591 Rem/hr per Ci/m2

Actinide Source

Point in time = 7.16485834 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.3340E+22	3.1050E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	5.4960E+21	5.0602E+05	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4432E+21	3.0334E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.1152E+20	2.9950E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	4.5997E+18	2.2102E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5677E+18	80.93	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0308E+17	1.075	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
Th-226	30.570	m	0.33	1.5777E+13	0.1611	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	2.8768E+11	0.1418	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.6494E+08	0.1418	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1.2392E+06	0.1418	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-231	1.0630	d	0.04	2.0279E+12	4.1365E-04	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	4.1673E+18	1.0261E-04	0.0001	0.0000	0.0000
Np-240m	7.4000	m	2.70	2.0159E+09	8.5058E-05	0.3148	0.6243	0.0000
Pu-240	6563.1	y	0.08	1.7819E+17	1.6118E-05	0.0000	0.0000	0.0000
U-235m	26.000	m	7.69	5.2751E+08	6.3348E-06	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	5.9283E+12	1.8397E-06	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	4.8261E+18	1.3388E-06	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	2.0976E+10	1.8880E-07	0.0094	0.0478	0.0000
Np-238	2.1170	d	0.09	1.5744E+09	1.6126E-07	0.6470	0.2105	0.0000
Pa-234m	1.1700	m	2.56	5.4321E+05	1.4496E-07	0.0160	0.8101	0.0000
Pb-210	22.160	y	0.54	1.0283E+12	2.7547E-08	0.0045	0.0061	0.0000
Pa-231	32771.	y	0.34	1.2879E+15	2.3330E-08	0.0394	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.4626E+07	8.7125E-10	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	1804.	6.0578E-10	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	4.845	6.0506E-10	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	1.0648E+07	8.5506E-11	0.2175	0.0664	0.0000
Th-230	75392.	y	0.40	1.2425E+12	9.7833E-12	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	8.4703E+10	6.8514E-12	0.0340	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.3350E+05	5.7752E-12	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	2806.	1.3722E-12	0.1437	0.0998	0.0000
Pa-234	6.7810	h	0.44	1433.	1.0993E-12	1.9000	0.2120	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8661E-13	0.0001	0.0000	0.0000
Pa-232	1.3100	d	1.53	631.6	1.0455E-13	0.9334	0.0935	0.0000
Bi-212	1.0090	h	0.10	4.774	2.4621E-14	0.1040	0.3164	0.0000
Pu-238	87.712	y	0.34	2.5670E+06	1.7374E-14	0.0018	0.0099	0.0000
Po-212	0.29800E-06	s	1.01	2.5113E-10	1.5787E-14	0.0000	0.0000	0.0000
Ac-227	21.770	y	0.01	1.8557E+05	5.0601E-15	0.0002	0.0097	0.0000
Tl-208	3.0530	m	0.13	2.0273E-02	2.0733E-15	3.3800	0.5598	0.0000
Th-227	18.720	d	0.03	99.70	1.1548E-15	0.1595	0.0000	0.0000
Ra-225	14.800	d	1.35	54.54	7.9907E-16	0.0137	0.0970	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Po-210	138.40	d	0.00	20.81	3.2608E-17	0.0000	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	8.5657E-10	9.0150E-18	0.0000	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.11628E+08

Total number of decays = 5.51412E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 3.05124E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.24250E-02
Average beta E (MeV) = 0.39363
Average alpha E (MeV) = 4.26572E-08

Composite Exposure Rate Conversion Factor = 0.900603056 R/hr per Ci/m2
Composite ECF per FGR table = 0.985706210 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.655313134 Rem/hr per Ci/m2

Actinide Source

Point in time = 8.94820118 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
U-239	23.470 m	0.21	2.2142E+22	2.9457E+08	0.0521	0.3947	0.0000
Np-239	2.3550 d	0.17	6.6912E+21	6.1606E+05	0.1740	0.1079	0.0000
U-237	6.7500 d	0.15	9.4420E+21	3.0330E+05	0.1440	0.0678	0.0000
U-240	14.100 h	1.42	8.1034E+20	2.9907E+05	0.0073	0.1070	0.0000
Np-240	1.0830 h	4.62	5.6867E+18	2.7325E+04	1.1900	0.2828	0.0000
U-231	4.2000 d	2.38	1.5674E+18	80.92	0.0824	0.0000	0.0000
U-230	20.800 d	10.09	1.0308E+17	1.075	0.0029	0.0000	5.8680
U-232	69.811 y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
Th-226	30.570 m	0.33	1.9321E+13	0.1973	0.0085	0.0000	6.3060
Ra-222	38.000 s	1.32	3.6265E+11	0.1788	0.0092	0.0000	6.5470
Rn-218	0.35000E-01 s	25.71	3.3398E+08	0.1788	0.0008	0.0000	7.1280
Po-214	0.16370E-03 s	0.12	1.5621E+06	0.1788	0.0002	0.0000	7.6870
U-235	0.70381E+09 y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06 y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06 y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08 y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10 y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Th-231	1.0630 d	0.04	2.5317E+12	5.1640E-04	0.0225	0.0794	0.0000
Pu-239	24111. y	0.05	6.3904E+18	1.5734E-04	0.0001	0.0000	5.1000
Np-240m	7.4000 m	2.70	1.7058E+09	7.1973E-05	0.3148	0.6243	0.0000
Pu-240	6563.1 y	0.08	2.7607E+17	2.4973E-05	0.0000	0.0000	5.1550
U-235m	26.000 m	7.69	1.0026E+09	1.2040E-05	0.0000	0.0000	0.0000
Th-228	1.9130 y	0.03	7.4039E+12	2.2976E-06	0.0031	0.0000	5.4060
Np-237	0.21400E+07 y	0.47	6.0269E+18	1.6719E-06	0.0320	0.0000	4.7900
Th-234	24.090 d	0.12	2.6197E+10	2.3579E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700 m	2.56	7.1773E+05	1.9154E-07	0.0160	0.8101	0.0000
Np-238	2.1170 d	0.09	1.5738E+09	1.6119E-07	0.6470	0.2105	0.0000
Pb-210	22.160 y	0.54	1.6634E+12	4.4560E-08	0.0045	0.0061	0.0000
Pa-231	32771. y	0.34	1.6082E+15	2.9134E-08	0.0394	0.0000	4.9240
Ra-224	3.6400 d	0.82	2.2811E+07	1.3588E-09	0.0104	0.0000	5.6740
Rn-220	55.800 s	0.54	3016.	1.0124E-09	0.0006	0.0000	6.2880
Po-216	0.15000 s	3.33	8.099	1.0115E-09	0.0000	0.0000	6.7780
Pa-233	27.000 d	0.37	1.6607E+07	1.3336E-10	0.2175	0.0664	0.0000
Th-230	75392. y	0.40	1.5517E+12	1.2218E-11	0.0004	0.0000	4.6640
Bi-210	5.0120 d	0.10	2.7491E+05	1.1893E-11	0.0004	0.3890	4.6480
Th-229	7339.2 y	2.18	1.0579E+11	8.5567E-12	0.0340	0.0000	4.9210
Pb-212	10.640 h	0.09	5962.	2.9158E-12	0.1437	0.0998	0.0000
Pa-234	6.7810 h	0.44	2426.	1.8615E-12	1.9000	0.2120	0.0000
Np-235	1.0840 y	0.28	1.6190E+06	8.8661E-13	0.0001	0.0000	0.0001
Pa-232	1.3100 d	1.53	631.2	1.0448E-13	0.9334	0.0935	0.0000
Bi-212	1.0090 h	0.10	12.84	6.6236E-14	0.1040	0.3164	2.1750
Po-212	0.29800E-06 s	1.01	6.7473E-10	4.2417E-14	0.0000	0.0000	8.7850
Pu-238	87.712 y	0.34	3.2053E+06	2.1694E-14	0.0018	0.0099	5.4860
Ac-227	21.770 y	0.01	2.8942E+05	7.8920E-15	0.0002	0.0097	0.0702
Tl-208	3.0530 m	0.13	6.5460E-02	6.6946E-15	3.3800	0.5598	0.0000
Ra-225	14.800 d	1.35	85.04	1.2458E-15	0.0137	0.0970	0.0000
Th-227	18.720 d	0.03	98.96	1.1462E-15	0.1595	0.0000	5.8900
Po-210	138.40 d	0.00	55.00	8.6166E-17	0.0000	0.0000	5.3040
Np-236	0.15200E+06 y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Fr-223	21.800 m	1.84	6.7272E-04	9.6350E-18	0.0634	0.3427	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.95813E+08

Total number of decays = 6.71628E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 3.71646E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.25079E-02
Average beta E (MeV) = 0.39347
Average alpha E (MeV) = 4.83785E-08

Composite Exposure Rate Conversion Factor = 0.901862800 R/hr per Ci/m2
Composite ECF per FGR table = 0.987212539 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.656349003 Rem/hr per Ci/m2

Actinide Source

Point in time = 11.1754322 min

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
U-239	23.470 m	0.21	2.0733E+22	2.7581E+08	0.0521	0.3947	0.0000
Np-239	2.3550 d	0.17	8.0975E+21	7.4554E+05	0.1740	0.1079	0.0000
U-237	6.7500 d	0.15	9.4405E+21	3.0325E+05	0.1440	0.0678	0.0000
U-240	14.100 h	1.42	8.0886E+20	2.9852E+05	0.0073	0.1070	0.0000
Np-240	1.0830 h	4.62	7.0132E+18	3.3698E+04	1.1900	0.2828	0.0000
U-231	4.2000 d	2.38	1.5670E+18	80.90	0.0824	0.0000	0.0000
U-230	20.800 d	10.09	1.0307E+17	1.074	0.0029	0.0000	0.0000
U-232	69.811 y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
Th-226	30.570 m	0.33	2.3551E+13	0.2405	0.0085	0.0000	0.0000
Ra-222	38.000 s	1.32	4.5212E+11	0.2229	0.0092	0.0000	0.0000
Rn-218	0.35000E-01 s	25.71	4.1640E+08	0.2229	0.0008	0.0000	0.0000
Po-214	0.16370E-03 s	0.12	1.9475E+06	0.2229	0.0002	0.0000	0.0000
U-235	0.70381E+09 y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06 y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06 y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08 y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10 y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-231	1.0630 d	0.04	3.1602E+12	6.4460E-04	0.0225	0.0794	0.0000
Pu-239	24111. y	0.05	9.7601E+18	2.4031E-04	0.0001	0.0000	0.0000
Np-240m	7.4000 m	2.70	1.3846E+09	5.8420E-05	0.3148	0.6243	0.0000
Pu-240	6563.1 y	0.08	4.2700E+17	3.8623E-05	0.0000	0.0000	0.0000
U-235m	26.000 m	7.69	1.8944E+09	2.2750E-05	0.0000	0.0000	0.0000
Th-228	1.9130 y	0.03	9.2468E+12	2.8694E-06	0.0031	0.0000	0.0000
Np-237	0.21400E+07 y	0.47	7.5265E+18	2.0878E-06	0.0320	0.0000	0.0000
Th-234	24.090 d	0.12	3.2717E+10	2.9447E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700 m	2.56	9.3703E+05	2.5006E-07	0.0160	0.8101	0.0000
Np-238	2.1170 d	0.09	1.5730E+09	1.6111E-07	0.6470	0.2105	0.0000
Pb-210	22.160 y	0.54	2.6573E+12	7.1184E-08	0.0045	0.0061	0.0000
Pa-231	32771. y	0.34	2.0083E+15	3.6380E-08	0.0394	0.0000	0.0000
Ra-224	3.6400 d	0.82	3.5577E+07	2.1192E-09	0.0104	0.0000	0.0000
Rn-220	55.800 s	0.54	4979.	1.6715E-09	0.0006	0.0000	0.0000
Po-216	0.15000 s	3.33	13.37	1.6703E-09	0.0000	0.0000	0.0000
Pa-233	27.000 d	0.37	2.5901E+07	2.0800E-10	0.2175	0.0664	0.0000
Bi-210	5.0120 d	0.10	5.5856E+05	2.4164E-11	0.0004	0.3890	0.0000
Th-230	75392. y	0.40	1.9379E+12	1.5260E-11	0.0004	0.0000	0.0000
Th-229	7339.2 y	2.18	1.3212E+11	1.0687E-11	0.0340	0.0000	0.0000
Pb-212	10.640 h	0.09	1.2501E+04	6.1139E-12	0.1437	0.0998	0.0000
Pa-234	6.7810 h	0.44	4051.	3.1087E-12	1.9000	0.2120	0.0000
Np-235	1.0840 y	0.28	1.6190E+06	8.8661E-13	0.0001	0.0000	0.0000
Bi-212	1.0090 h	0.10	33.95	1.7509E-13	0.1040	0.3164	0.0000
Po-212	0.29800E-06 s	1.01	1.7839E-09	1.1214E-13	0.0000	0.0000	0.0000
Pa-232	1.3100 d	1.53	630.7	1.0439E-13	0.9334	0.0935	0.0000
Pu-238	87.712 y	0.34	4.0021E+06	2.7087E-14	0.0018	0.0099	0.0000
Tl-208	3.0530 m	0.13	0.2050	2.0967E-14	3.3800	0.5598	0.0000
Ac-227	21.770 y	0.01	4.5138E+05	1.2309E-14	0.0002	0.0097	0.0000
Ra-225	14.800 d	1.35	132.6	1.9430E-15	0.0137	0.0970	0.0000
Th-227	18.720 d	0.03	99.88	1.1569E-15	0.1595	0.0000	0.0000
Po-210	138.40 d	0.00	142.3	2.2288E-16	0.0000	0.0000	0.0000
Np-236	0.15200E+06 y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Fr-223	21.800 m	1.84	1.2884E-03	1.8453E-17	0.0634	0.3427	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.77195E+08

Total number of decays = 8.13238E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 4.50006E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.26185E-02
Average beta E (MeV) = 0.39325
Average alpha E (MeV) = 5.60104E-08

Composite Exposure Rate Conversion Factor = 0.903547049 R/hr per Ci/m2
Composite ECF per FGR table = 0.989224553 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.657731116 Rem/hr per Ci/m2

Actinide Source

Point in time = 13.9570141 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.9098E+22	2.5406E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	9.7275E+21	8.9561E+05	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4386E+21	3.0319E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.0702E+20	2.9784E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	8.6224E+18	4.1430E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5665E+18	80.87	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0307E+17	1.074	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
Th-226	30.570	m	0.33	2.8541E+13	0.2915	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	5.5770E+11	0.2749	0.0092	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	5.1364E+08	0.2749	0.0008	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2.4024E+06	0.2749	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-231	1.0630	d	0.04	3.9443E+12	8.0454E-04	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	1.4834E+19	3.6523E-04	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	6.5909E+17	5.9616E-05	0.0000	0.0000	0.0000
Np-240m	7.4000	m	2.70	1.0670E+09	4.5020E-05	0.3148	0.6243	0.0000
U-235m	26.000	m	7.69	3.5532E+09	4.2670E-05	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	1.1548E+13	3.5836E-06	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.3989E+18	2.6072E-06	0.0320	0.0000	0.0000
Th-234	24.090	d	0.12	4.0859E+10	3.6776E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.2115E+06	3.2330E-07	0.0160	0.8101	0.0000
Np-238	2.1170	d	0.09	1.5720E+09	1.6101E-07	0.6470	0.2105	0.0000
Pb-210	22.160	y	0.54	4.1959E+12	1.1240E-07	0.0045	0.0061	0.0000
Pa-231	32771.	y	0.34	2.5077E+15	4.5428E-08	0.0394	0.0000	0.0000
Ra-224	3.6400	d	0.82	5.5484E+07	3.3051E-09	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	8134.	2.7308E-09	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	21.85	2.7293E-09	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	4.0396E+07	3.2440E-10	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	1.1207E+06	4.8485E-11	0.0004	0.3890	0.0000
Th-230	75392.	y	0.40	2.4203E+12	1.9058E-11	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.6500E+11	1.3346E-11	0.0340	0.0000	0.0000
Pb-212	10.640	h	0.09	2.5893E+04	1.2664E-11	0.1437	0.0998	0.0000
Pa-234	6.7810	h	0.44	6681.	5.1272E-12	1.9000	0.2120	0.0000
Np-235	1.0840	y	0.28	1.6190E+06	8.8660E-13	0.0001	0.0000	0.0000
Bi-212	1.0090	h	0.10	88.43	4.5606E-13	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	4.6480E-09	2.9219E-13	0.0000	0.0000	0.0000
Pa-232	1.3100	d	1.53	630.1	1.0428E-13	0.9334	0.0935	0.0000
Tl-208	3.0530	m	0.13	0.6249	6.3911E-14	3.3800	0.5598	0.0000
Pu-238	87.712	y	0.34	4.9966E+06	3.3818E-14	0.0018	0.0099	0.0000
Ac-227	21.770	y	0.01	7.0397E+05	1.9196E-14	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	206.8	3.0296E-15	0.0137	0.0970	0.0000
Th-227	18.720	d	0.03	98.80	1.1444E-15	0.1595	0.0000	0.0000
Po-210	138.40	d	0.00	360.8	5.6526E-16	0.0000	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000
Fr-223	21.800	m	1.84	2.4579E-03	3.5203E-17	0.0634	0.3427	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.55600E+08

Total number of decays = 9.77651E+21
Asympt number of decays = 1.80717E+27
Percent of decays = 5.40983E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.27684E-02
Average beta E (MeV) = 0.39295
Average alpha E (MeV) = 6.63516E-08

Composite Exposure Rate Conversion Factor = 0.905836046 R/hr per Ci/m2
Composite ECF per FGR table = 0.991955638 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.659604967 Rem/hr per Ci/m2

Actinide Source

Point in time = 17.4309502 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.7235E+22	2.2929E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	1.1582E+22	1.0664E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4363E+21	3.0311E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	8.0472E+20	2.9700E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	1.0560E+19	5.0743E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5659E+18	80.84	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0306E+17	1.074	0.0029	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
Th-226	30.570	m	0.33	3.4347E+13	0.3508	0.0085	0.0000	6.3060
Ra-222	38.000	s	1.32	6.8053E+11	0.3355	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	6.2678E+08	0.3355	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	2.9315E+06	0.3355	0.0002	0.0000	7.6870
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Th-231	1.0630	d	0.04	4.9222E+12	1.0040E-03	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	2.2411E+19	5.5179E-04	0.0001	0.0000	5.1000
Pu-240	6563.1	y	0.08	1.0148E+18	9.1787E-05	0.0000	0.0000	5.1550
U-235m	26.000	m	7.69	6.6049E+09	7.9317E-05	0.0000	0.0000	0.0000
Np-240m	7.4000	m	2.70	7.7064E+08	3.2516E-05	0.3148	0.6243	0.0000
Th-228	1.9130	y	0.03	1.4423E+13	4.4756E-06	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.1737E+19	3.2558E-06	0.0320	0.0000	4.7900
Th-234	24.090	d	0.12	5.1027E+10	4.5927E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.5544E+06	4.1481E-07	0.0160	0.8101	0.0000
Pb-210	22.160	y	0.54	6.5528E+12	1.7554E-07	0.0045	0.0061	0.0000
Np-238	2.1170	d	0.09	1.5708E+09	1.6088E-07	0.6470	0.2105	0.0000
Pa-231	32771.	y	0.34	3.1313E+15	5.6724E-08	0.0394	0.0000	4.9240
Ra-224	3.6400	d	0.82	8.6529E+07	5.1543E-09	0.0104	0.0000	5.6740
Rn-220	55.800	s	0.54	1.3172E+04	4.4221E-09	0.0006	0.0000	6.2880
Po-216	0.15000	s	3.33	35.39	4.4202E-09	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	6.3001E+07	5.0593E-10	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	2.2225E+06	9.6148E-11	0.0004	0.3890	4.6480
Pb-212	10.640	h	0.09	5.3055E+04	2.5948E-11	0.1437	0.0998	0.0000
Th-230	75392.	y	0.40	3.0227E+12	2.3801E-11	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	2.0607E+11	1.6668E-11	0.0340	0.0000	4.9210
Pa-234	6.7810	h	0.44	1.0899E+04	8.3639E-12	1.9000	0.2120	0.0000
Bi-212	1.0090	h	0.10	227.3	1.1722E-12	0.1040	0.3164	2.1750
Np-235	1.0840	y	0.28	1.6190E+06	8.8660E-13	0.0001	0.0000	0.0001
Po-212	0.29800E-06	s	1.01	1.1946E-08	7.5096E-13	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.854	1.8964E-13	3.3800	0.5598	0.0000
Pa-232	1.3100	d	1.53	629.3	1.0415E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	6.2378E+06	4.2219E-14	0.0018	0.0099	5.4860
Ac-227	21.770	y	0.01	1.0979E+06	2.9938E-14	0.0002	0.0097	0.0702
Ra-225	14.800	d	1.35	322.6	4.7261E-15	0.0137	0.0970	0.0000
Po-210	138.40	d	0.00	904.9	1.4177E-15	0.0000	0.0000	5.3040
Th-227	18.720	d	0.03	100.1	1.1599E-15	0.1595	0.0000	5.8900
Fr-223	21.800	m	1.84	4.6662E-03	6.6832E-17	0.0634	0.3427	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.31006E+08

Total number of decays = 1.16513E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 6.44723E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.29757E-02
Average beta E (MeV) = 0.39255
Average alpha E (MeV) = 8.06369E-08

Composite Exposure Rate Conversion Factor = 0.909010291 R/hr per Ci/m2
Composite ECF per FGR table = 0.995737374 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.662195861 Rem/hr per Ci/m2

Actinide Source

Point in time = 21.7695389 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.5163E+22	2.0171E+08	0.0521	0.3947	0.0000	0.0000
Np-239	2.3550	d	0.17	1.3644E+22	1.2562E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.4333E+21	3.0302E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	8.0187E+20	2.9594E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	1.2873E+19	6.1856E+04	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5651E+18	80.80	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0305E+17	1.074	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	4.0983E+13	0.4186	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	8.2093E+11	0.4047	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	7.5610E+08	0.4047	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	3.5364E+06	0.4047	0.0002	0.0000	0.0000	7.6870
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-231	1.0630	d	0.04	6.1413E+12	1.2527E-03	0.0225	0.0794	0.0000	0.0000
Pu-239	24111.	y	0.05	3.3615E+19	8.2767E-04	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	1.2143E+10	1.4583E-04	0.0000	0.0000	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.5575E+18	1.4088E-04	0.0000	0.0000	0.0000	5.1550
Np-240m	7.4000	m	2.70	5.1328E+08	2.1657E-05	0.3148	0.6243	0.0000	0.0000
Th-228	1.9130	y	0.03	1.8012E+13	5.5896E-06	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.4656E+19	4.0655E-06	0.0320	0.0000	0.0000	4.7900
Th-234	24.090	d	0.12	6.3725E+10	5.7356E-07	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.9827E+06	5.2910E-07	0.0160	0.8101	0.0000	0.0000
Pb-210	22.160	y	0.54	1.0123E+13	2.7118E-07	0.0045	0.0061	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5692E+09	1.6072E-07	0.6470	0.2105	0.0000	0.0000
Pa-231	32771.	y	0.34	3.9097E+15	7.0826E-08	0.0394	0.0000	0.0000	4.9240
Ra-224	3.6400	d	0.82	1.3494E+08	8.0379E-09	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	2.1173E+04	7.1085E-09	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	56.90	7.1060E-09	0.0000	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	9.8253E+07	7.8903E-10	0.2175	0.0664	0.0000	0.0000
Bi-210	5.0120	d	0.10	4.3581E+06	1.8854E-10	0.0004	0.3890	0.0000	4.6480
Pb-212	10.640	h	0.09	1.0768E+05	5.2665E-11	0.1437	0.0998	0.0000	0.0000
Th-230	75392.	y	0.40	3.7750E+12	2.9725E-11	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	2.5736E+11	2.0817E-11	0.0340	0.0000	0.0000	4.9210
Pa-234	6.7810	h	0.44	1.7613E+04	1.3516E-11	1.9000	0.2120	0.0000	0.0000
Bi-212	1.0090	h	0.10	576.8	2.9750E-12	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	3.0316E-08	1.9058E-12	0.0000	0.0000	0.0000	8.7850
Np-235	1.0840	y	0.28	1.6190E+06	8.8660E-13	0.0001	0.0000	0.0000	0.0001
Tl-208	3.0530	m	0.13	5.353	5.4740E-13	3.3800	0.5598	0.0000	0.0000
Pa-232	1.3100	d	1.53	628.3	1.0399E-13	0.9334	0.0935	0.0000	0.0000
Pu-238	87.712	y	0.34	7.7866E+06	5.2701E-14	0.0018	0.0099	0.0000	5.4860
Ac-227	21.770	y	0.01	1.7121E+06	4.6688E-14	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	503.0	7.3689E-15	0.0137	0.0970	0.0000	0.0000
Po-210	138.40	d	0.00	2244.	3.5157E-15	0.0000	0.0000	0.0000	5.3040
Th-227	18.720	d	0.03	99.33	1.1505E-15	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800	m	1.84	8.8073E-03	1.2614E-16	0.0634	0.3427	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.03631E+08

Total number of decays = 1.37416E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 7.60391E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.32693E-02
Average beta E (MeV) = 0.39199
Average alpha E (MeV) = 1.00843E-07

Composite Exposure Rate Conversion Factor = 0.913522005 R/hr per Ci/m2
Composite ECF per FGR table = 1.00110388 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.665866315 Rem/hr per Ci/m2

Actinide Source

Point in time = 27.1880074 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.2920E+22	1.7188E+08	0.0521	0.3947	0.0000	0.0000
Np-239	2.3550	d	0.17	1.5870E+22	1.4611E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.4297E+21	3.0290E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	7.9832E+20	2.9463E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	1.5601E+19	7.4965E+04	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5641E+18	80.75	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0304E+17	1.074	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	4.8404E+13	0.4944	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	9.7792E+11	0.4821	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	9.0070E+08	0.4821	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	4.2127E+06	0.4821	0.0002	0.0000	0.0000	7.6870
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-231	1.0630	d	0.04	7.6605E+12	1.5625E-03	0.0225	0.0794	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pu-239	24111.	y	0.05	4.9992E+19	1.2309E-03	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	2.2029E+10	2.6455E-04	0.0000	0.0000	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.3812E+18	2.1538E-04	0.0000	0.0000	0.0000	5.1550
Np-240m	7.4000	m	2.70	3.0898E+08	1.3037E-05	0.3148	0.6243	0.0000	0.0000
Th-228	1.9130	y	0.03	2.2496E+13	6.9808E-06	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.8300E+19	5.0765E-06	0.0320	0.0000	0.0000	4.7900
Th-234	24.090	d	0.12	7.9582E+10	7.1629E-07	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.5175E+06	6.7183E-07	0.0160	0.8101	0.0000	0.0000
Pb-210	22.160	y	0.54	1.5466E+13	4.1431E-07	0.0045	0.0061	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5673E+09	1.6052E-07	0.6470	0.2105	0.0000	0.0000
Pa-231	32771.	y	0.34	4.8814E+15	8.8427E-08	0.0394	0.0000	0.0000	4.9240
Ra-224	3.6400	d	0.82	2.1042E+08	1.2534E-08	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	3.3833E+04	1.1359E-08	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	90.92	1.1356E-08	0.0000	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	1.5323E+08	1.2305E-09	0.2175	0.0664	0.0000	0.0000
Bi-210	5.0120	d	0.10	8.4528E+06	3.6568E-10	0.0004	0.3890	0.0000	4.6480
Pb-212	10.640	h	0.09	2.1679E+05	1.0603E-10	0.1437	0.0998	0.0000	0.0000
Th-230	75392.	y	0.40	4.7147E+12	3.7124E-11	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	3.2142E+11	2.5999E-11	0.0340	0.0000	0.0000	4.9210
Pa-234	6.7810	h	0.44	2.8238E+04	2.1670E-11	1.9000	0.2120	0.0000	0.0000
Bi-212	1.0090	h	0.10	1447.	7.4619E-12	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	7.6038E-08	4.7801E-12	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	15.04	1.5379E-12	3.3800	0.5598	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6189E+06	8.8659E-13	0.0001	0.0000	0.0000	0.0001
Pa-232	1.3100	d	1.53	627.0	1.0378E-13	0.9334	0.0935	0.0000	0.0000
Ac-227	21.770	y	0.01	2.6700E+06	7.2806E-14	0.0002	0.0097	0.0000	0.0702
Pu-238	87.712	y	0.34	9.7187E+06	6.5778E-14	0.0018	0.0099	0.0000	5.4860
Ra-225	14.800	d	1.35	784.5	1.1493E-14	0.0137	0.0970	0.0000	0.0000
Po-210	138.40	d	0.00	5503.	8.6205E-15	0.0000	0.0000	0.0000	5.3040
Th-227	18.720	d	0.03	100.2	1.1603E-15	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800	m	1.84	1.6508E-02	2.3643E-16	0.0634	0.3427	0.0000	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 1.74018E+08

Total number of decays = 1.60082E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 8.85815E-04
Average chain length = 11.185

Average gamma E (MeV) = 5.36978E-02
Average beta E (MeV) = 0.39119
Average alpha E (MeV) = 1.30260E-07

Composite Exposure Rate Conversion Factor = 0.920131862 R/hr per Ci/m2
Composite ECF per FGR table = 1.00895083 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.671222925 Rem/hr per Ci/m2

Actinide Source

Point in time = 33.9551735 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.0580E+22	1.4075E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	1.8187E+22	1.6744E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4252E+21	3.0276E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.9390E+20	2.9300E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	1.8773E+19	9.0205E+04	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5629E+18	80.69	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0302E+17	1.074	0.0029	0.0000	5.8680
Th-226	30.570	m	0.33	5.6476E+13	0.5768	0.0085	0.0000	6.3060
Ra-222	38.000	s	1.32	1.1487E+12	0.5663	0.0092	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.0580E+09	0.5663	0.0008	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	4.9484E+06	0.5663	0.0002	0.0000	7.6870
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
Th-231	1.0630	d	0.04	9.5526E+12	1.9485E-03	0.0225	0.0794	0.0000
Pu-239	24111.	y	0.05	7.3599E+19	1.8121E-03	0.0001	0.0000	5.1000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
U-235m	26.000	m	7.69	3.9325E+10	4.7224E-04	0.0000	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.6234E+18	3.2774E-04	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	2.8095E+13	8.7183E-06	0.0031	0.0000	5.4060
Np-240m	7.4000	m	2.70	1.6393E+08	6.9166E-06	0.3148	0.6243	0.0000
Np-237	0.21400E+07	y	0.47	2.2850E+19	6.3385E-06	0.0320	0.0000	4.7900
Th-234	24.090	d	0.12	9.9383E+10	8.9451E-07	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.1854E+06	8.5006E-07	0.0160	0.8101	0.0000
Pb-210	22.160	y	0.54	2.3357E+13	6.2571E-07	0.0045	0.0061	0.0000
Np-238	2.1170	d	0.09	1.5649E+09	1.6028E-07	0.6470	0.2105	0.0000
Pa-231	32771.	y	0.34	6.0940E+15	1.1039E-07	0.0394	0.0000	4.9240
Ra-224	3.6400	d	0.82	3.2811E+08	1.9544E-08	0.0104	0.0000	5.6740
Rn-220	55.800	s	0.54	5.3799E+04	1.8062E-08	0.0006	0.0000	6.2880
Po-216	0.15000	s	3.33	144.6	1.8058E-08	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	2.3895E+08	1.9189E-09	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	1.6215E+07	7.0147E-10	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	4.3347E+05	2.1200E-10	0.1437	0.0998	0.0000
Th-230	75392.	y	0.40	5.8882E+12	4.6364E-11	0.0004	0.0000	4.6640
Pa-234	6.7810	h	0.44	4.4967E+04	3.4508E-11	1.9000	0.2120	0.0000
Th-229	7339.2	y	2.18	4.0142E+11	3.2470E-11	0.0340	0.0000	4.9210
Bi-212	1.0090	h	0.10	3589.	1.8511E-11	0.1040	0.3164	2.1750
Po-212	0.29800E-06	s	1.01	1.8863E-07	1.1858E-11	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	41.15	4.2086E-12	3.3800	0.5598	0.0000
Np-235	1.0840	y	0.28	1.6189E+06	8.8658E-13	0.0001	0.0000	0.0001
Ac-227	21.770	y	0.01	4.1634E+06	1.1353E-13	0.0002	0.0097	0.0702
Pa-232	1.3100	d	1.53	625.4	1.0352E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	1.2128E+07	8.2087E-14	0.0018	0.0099	5.4860
Po-210	138.40	d	0.00	1.3346E+04	2.0909E-14	0.0000	0.0000	5.3040
Ra-225	14.800	d	1.35	1223.	1.7924E-14	0.0137	0.0970	0.0000
Th-227	18.720	d	0.03	101.5	1.1755E-15	0.1595	0.0000	5.8900
Fr-223	21.800	m	1.84	3.0687E-02	4.3952E-16	0.0634	0.3427	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 84
Total activity (Ci) = 1.43108E+08

Total number of decays = 1.83826E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.01720E-03
Average chain length = 11.185

Average gamma E (MeV) = 5.43463E-02
Average beta E (MeV) = 0.38999
Average alpha E (MeV) = 1.74614E-07

Composite Exposure Rate Conversion Factor = 0.930176795 R/hr per Ci/m2
Composite ECF per FGR table = 1.02085090 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.679328203 Rem/hr per Ci/m2

Actinide Source

Point in time = 42.4066658 min

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	8.2429E+21	1.0966E+08	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	2.0490E+22	1.8865E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4195E+21	3.0257E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.8842E+20	2.9098E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	2.2393E+19	1.0760E+05	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5614E+18	80.61	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0300E+17	1.074	0.0029	0.0000	0.0000
Th-226	30.570	m	0.33	6.4961E+13	0.6635	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	1.3282E+12	0.6548	0.0092	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	5.7218E+06	0.6548	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.2234E+09	0.6548	0.0008	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Pu-239	24111.	y	0.05	1.0709E+20	2.6367E-03	0.0001	0.0000	0.0000
Th-231	1.0630	d	0.04	1.1907E+13	2.4288E-03	0.0225	0.0794	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
U-235m	26.000	m	7.69	6.8860E+10	8.2693E-04	0.0000	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.4818E+18	4.9584E-04	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	3.5088E+13	1.0888E-05	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.8528E+19	7.9138E-06	0.0320	0.0000	0.0000
Np-240m	7.4000	m	2.70	7.4275E+07	3.1339E-06	0.3148	0.6243	0.0000
Th-234	24.090	d	0.12	1.2411E+11	1.1171E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	4.0194E+06	1.0726E-06	0.0160	0.8101	0.0000
Pb-210	22.160	y	0.54	3.4839E+13	9.3329E-07	0.0045	0.0061	0.0000
Np-238	2.1170	d	0.09	1.5619E+09	1.5997E-07	0.6470	0.2105	0.0000
Pa-231	32771.	y	0.34	7.6072E+15	1.3781E-07	0.0394	0.0000	0.0000
Ra-224	3.6400	d	0.82	5.1157E+08	3.0473E-08	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	8.5209E+04	2.8607E-08	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	229.0	2.8602E-08	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	3.7261E+08	2.9922E-09	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	3.0752E+07	1.3304E-09	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	8.6163E+05	4.2140E-10	0.1437	0.0998	0.0000
Th-230	75392.	y	0.40	7.3537E+12	5.7905E-11	0.0004	0.0000	0.0000
Pa-234	6.7810	h	0.44	7.1193E+04	5.4634E-11	1.9000	0.2120	0.0000
Bi-212	1.0090	h	0.10	8811.	4.5440E-11	0.1040	0.3164	0.0000
Th-229	7339.2	y	2.18	5.0133E+11	4.0551E-11	0.0340	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	4.6303E-07	2.9109E-11	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	109.8	1.1234E-11	3.3800	0.5598	0.0000
Np-235	1.0840	y	0.28	1.6189E+06	8.8657E-13	0.0001	0.0000	0.0000
Ac-227	21.770	y	0.01	6.4918E+06	1.7702E-13	0.0002	0.0097	0.0000
Pa-232	1.3100	d	1.53	623.5	1.0320E-13	0.9334	0.0935	0.0000
Pu-238	87.712	y	0.34	1.5133E+07	1.0242E-13	0.0018	0.0099	0.0000
Po-210	138.40	d	0.00	3.2017E+04	5.0159E-14	0.0000	0.0000	0.0000
Ra-225	14.800	d	1.35	1908.	2.7953E-14	0.0137	0.0970	0.0000
Th-227	18.720	d	0.03	104.0	1.2051E-15	0.1595	0.0000	0.0000
Fr-223	21.800	m	1.84	5.6498E-02	8.0919E-16	0.0634	0.3427	0.0000
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 1.12246E+08

Total number of decays = 2.07661E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.14909E-03
Average chain length = 11.185

Average gamma E (MeV) = 5.53712E-02
Average beta E (MeV) = 0.38815
Average alpha E (MeV) = 2.44372E-07

Composite Exposure Rate Conversion Factor = 0.946130276 R/hr per Ci/m2
Composite ECF per FGR table = 1.03970623 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.692139924 Rem/hr per Ci/m2

Actinide Source

Point in time = 52.9617386 min

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	6.0353E+21	8.0290E+07	0.0521	0.3947	0.0000	0.0000
Np-239	2.3550	d	0.17	2.2651E+22	2.0855E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.4124E+21	3.0235E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	7.8164E+20	2.8847E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	2.6429E+19	1.2699E+05	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5595E+18	80.51	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0297E+17	1.073	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	7.3507E+13	0.7508	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	1.5090E+12	0.7439	0.0092	0.0000	0.0000	6.5470
Rn-218	0.35000E-01	s	25.71	1.3899E+09	0.7439	0.0008	0.0000	0.0000	7.1280
Po-214	0.16370E-03	s	0.12	6.5007E+06	0.7439	0.0002	0.0000	0.0000	7.6870
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Pu-239	24111.	y	0.05	1.5375E+20	3.7856E-03	0.0001	0.0000	0.0000	5.1000
Th-231	1.0630	d	0.04	1.4836E+13	3.0262E-03	0.0225	0.0794	0.0000	0.0000
U-235m	26.000	m	7.69	1.1787E+11	1.4155E-03	0.0000	0.0000	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pu-240	6563.1	y	0.08	8.2351E+18	7.4488E-04	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	4.3821E+13	1.3598E-05	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.5616E+19	9.8798E-06	0.0320	0.0000	0.0000	4.7900
Th-234	24.090	d	0.12	1.5498E+11	1.3950E-06	0.0094	0.0478	0.0000	0.0000
Pb-210	22.160	y	0.54	5.1269E+13	1.3734E-06	0.0045	0.0061	0.0000	0.0000
Pa-234m	1.1700	m	2.56	5.0607E+06	1.3505E-06	0.0160	0.8101	0.0000	0.0000
Np-240m	7.4000	m	2.70	2.7636E+07	1.1660E-06	0.3148	0.6243	0.0000	0.0000
Pa-231	32771.	y	0.34	9.4949E+15	1.7200E-07	0.0394	0.0000	0.0000	4.9240
Np-238	2.1170	d	0.09	1.5581E+09	1.5958E-07	0.6470	0.2105	0.0000	0.0000
Ra-224	3.6400	d	0.82	7.9755E+08	4.7508E-08	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.3453E+05	4.5165E-08	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	361.6	4.5158E-08	0.0000	0.0000	0.0000	6.7780
Pa-233	27.000	d	0.37	5.8099E+08	4.6657E-09	0.2175	0.0664	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.7624E+07	2.4929E-09	0.0004	0.3890	0.0000	4.6480
Pb-212	10.640	h	0.09	1.7041E+06	8.3346E-10	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	2.1407E+04	1.1041E-10	0.1040	0.3164	0.0000	2.1750
Pa-234	6.7810	h	0.44	1.1214E+05	8.6060E-11	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	9.1841E+12	7.2317E-11	0.0004	0.0000	0.0000	4.6640
Po-212	0.29800E-06	s	1.01	1.1250E-06	7.0726E-11	0.0000	0.0000	0.0000	8.7850
Th-229	7339.2	y	2.18	6.2611E+11	5.0645E-11	0.0340	0.0000	0.0000	4.9210
Tl-208	3.0530	m	0.13	286.4	2.9287E-11	3.3800	0.5598	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6189E+06	8.8656E-13	0.0001	0.0000	0.0000	0.0001
Ac-227	21.770	y	0.01	1.0122E+07	2.7600E-13	0.0002	0.0097	0.0000	0.0702
Pu-238	87.712	y	0.34	1.8877E+07	1.2776E-13	0.0018	0.0099	0.0000	5.4860
Po-210	138.40	d	0.00	7.5939E+04	1.1897E-13	0.0000	0.0000	0.0000	5.3040
Pa-232	1.3100	d	1.53	621.1	1.0280E-13	0.9334	0.0935	0.0000	0.0000
Ra-225	14.800	d	1.35	2976.	4.3594E-14	0.0137	0.0970	0.0000	0.0000
Fr-223	21.800	m	1.84	0.1029	1.4734E-15	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	109.4	1.2672E-15	0.1595	0.0000	0.0000	5.8900
Np-236	0.15200E+06	y	1.97	1.1400E+07	4.4523E-17	0.1420	0.0071	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 8.30929E+07

Total number of decays = 2.30370E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.27475E-03
Average chain length = 11.185

Average gamma E (MeV) = 5.70774E-02
Average beta E (MeV) = 0.38514
Average alpha E (MeV) = 3.59715E-07

Composite Exposure Rate Conversion Factor = 0.972824275 R/hr per Ci/m2
Composite ECF per FGR table = 1.07117796 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.713467538 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.10240090 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	4.0890E+21	5.4398E+07	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	2.4533E+22	2.2588E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.4035E+21	3.0206E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.7324E+20	2.8538E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	3.0794E+19	1.4797E+05	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5572E+18	80.39	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0294E+17	1.073	0.0029	0.0000	0.0000
Th-226	30.570	m	0.33	8.1665E+13	0.8341	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	1.6816E+12	0.8290	0.0092	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	7.2442E+06	0.8290	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.5489E+09	0.8290	0.0008	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	2.1749E+20	5.3550E-03	0.0001	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Th-231	1.0630	d	0.04	1.8474E+13	3.7682E-03	0.0225	0.0794	0.0000
U-235m	26.000	m	7.69	1.9653E+11	2.3600E-03	0.0000	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.2267E+19	1.1095E-03	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	5.4728E+13	1.6983E-05	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	4.4460E+19	1.2333E-05	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	7.4347E+13	1.9916E-06	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	1.9353E+11	1.7419E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	6.3610E+06	1.6975E-06	0.0160	0.8101	0.0000
Np-240m	7.4000	m	2.70	8.0392E+06	3.3920E-07	0.3148	0.6243	0.0000
Pa-231	32771.	y	0.34	1.1849E+16	2.1465E-07	0.0394	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5535E+09	1.5911E-07	0.6470	0.2105	0.0000
Ra-224	3.6400	d	0.82	1.2433E+09	7.4058E-08	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	2.1183E+05	7.1119E-08	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	569.4	7.1111E-08	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	9.0585E+08	7.2745E-09	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	1.0660E+08	4.6116E-09	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	3.3558E+06	1.6413E-09	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	5.1480E+04	2.6550E-10	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	2.7055E-06	1.7008E-10	0.0000	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.7584E+05	1.3494E-10	1.9000	0.2120	0.0000
Th-230	75392.	y	0.40	1.1470E+13	9.0317E-11	0.0004	0.0000	0.0000
Tl-208	3.0530	m	0.13	730.2	7.4680E-11	3.3800	0.5598	0.0000
Th-229	7339.2	y	2.18	7.8195E+11	6.3250E-11	0.0340	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6189E+06	8.8655E-13	0.0001	0.0000	0.0000
Ac-227	21.770	y	0.01	1.5779E+07	4.3028E-13	0.0002	0.0097	0.0000
Po-210	138.40	d	0.00	1.7799E+05	2.7884E-13	0.0000	0.0000	0.0000
Pu-238	87.712	y	0.34	2.3540E+07	1.5932E-13	0.0018	0.0099	0.0000
Pa-232	1.3100	d	1.53	618.1	1.0230E-13	0.9334	0.0935	0.0000
Ra-225	14.800	d	1.35	4641.	6.7986E-14	0.0137	0.0970	0.0000
Fr-223	21.800	m	1.84	0.1850	2.6495E-15	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	119.2	1.3812E-15	0.1595	0.0000	0.0000
Ac-225	10.000	d	1.00	3.428	7.4322E-17	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 5.73920E+07

Total number of decays = 2.50683E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.38715E-03
Average chain length = 11.185

Average gamma E (MeV) = 6.00923E-02
Average beta E (MeV) = 0.37997
Average alpha E (MeV) = 5.61765E-07

Composite Exposure Rate Conversion Factor = 1.02024651 R/hr per Ci/m2
Composite ECF per FGR table = 1.12694359 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.751153886 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.37679005 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.5145E+21	3.3452E+07	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	2.6023E+22	2.3959E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.3925E+21	3.0171E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.6288E+20	2.8155E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	3.5334E+19	1.6978E+05	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5542E+18	80.24	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0290E+17	1.073	0.0029	0.0000	5.8680
Th-226	30.570	m	0.33	8.8948E+13	0.9085	0.0085	0.0000	6.3060
Ra-222	38.000	s	1.32	1.8357E+12	0.9050	0.0092	0.0000	6.5470
Po-214	0.16370E-03	s	0.12	7.9081E+06	0.9050	0.0002	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.6908E+09	0.9050	0.0008	0.0000	7.1280
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	4.7590
Pu-239	24111.	y	0.05	3.0276E+20	7.4547E-03	0.0001	0.0000	5.1000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	4.8130
Th-231	1.0630	d	0.04	2.2986E+13	4.6886E-03	0.0225	0.0794	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	4.4770
U-235m	26.000	m	7.69	3.1803E+11	3.8192E-03	0.0000	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.8087E+19	1.6360E-03	0.0000	0.0000	5.1550
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	4.1930
Th-228	1.9130	y	0.03	6.8349E+13	2.1210E-05	0.0031	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	5.5493E+19	1.5394E-05	0.0320	0.0000	4.7900
Pb-210	22.160	y	0.54	1.0612E+14	2.8428E-06	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	2.4167E+11	2.1751E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	7.9844E+06	2.1307E-06	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.4785E+16	2.6783E-07	0.0394	0.0000	4.9240
Np-238	2.1170	d	0.09	1.5477E+09	1.5851E-07	0.6470	0.2105	0.0000
Ra-224	3.6400	d	0.82	1.9378E+09	1.1543E-07	0.0104	0.0000	5.6740
Rn-220	55.800	s	0.54	3.3285E+05	1.1175E-07	0.0006	0.0000	6.2880
Po-216	0.15000	s	3.33	894.7	1.1174E-07	0.0000	0.0000	6.7780
Np-240m	7.4000	m	2.70	1.7198E+06	7.2566E-08	0.3148	0.6243	0.0000
Pa-233	27.000	d	0.37	1.4122E+09	1.1341E-08	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	1.9449E+08	8.4137E-09	0.0004	0.3890	4.6480
Pb-212	10.640	h	0.09	6.5828E+06	3.2195E-09	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	1.2248E+05	6.3168E-10	0.1040	0.3164	2.1750
Po-212	0.29800E-06	s	1.01	6.4369E-06	4.0466E-10	0.0000	0.0000	8.7850
Pa-234	6.7810	h	0.44	2.7451E+05	2.1066E-10	1.9000	0.2120	0.0000
Tl-208	3.0530	m	0.13	1823.	1.8646E-10	3.3800	0.5598	0.0000
Th-230	75392.	y	0.40	1.4325E+13	1.1280E-10	0.0004	0.0000	4.6640
Th-229	7339.2	y	2.18	9.7658E+11	7.8993E-11	0.0340	0.0000	4.9210
Np-235	1.0840	y	0.28	1.6188E+06	8.8653E-13	0.0001	0.0000	0.0001
Ac-227	21.770	y	0.01	2.4596E+07	6.7071E-13	0.0002	0.0097	0.0702
Po-210	138.40	d	0.00	4.1191E+05	6.4533E-13	0.0000	0.0000	5.3040
Pu-238	87.712	y	0.34	2.9344E+07	1.9861E-13	0.0018	0.0099	5.4860
Ra-225	14.800	d	1.35	7237.	1.0602E-13	0.0137	0.0970	0.0000
Pa-232	1.3100	d	1.53	614.4	1.0169E-13	0.9334	0.0935	0.0000
Fr-223	21.800	m	1.84	0.3281	4.6998E-15	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	139.3	1.6139E-15	0.1595	0.0000	5.8900
Ac-225	10.000	d	1.00	6.541	1.4183E-16	0.0176	0.0000	5.7880

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.66008E+07

Total number of decays = 2.67552E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.48050E-03
Average chain length = 11.185

Average gamma E (MeV) = 6.57710E-02
Average beta E (MeV) = 0.37050
Average alpha E (MeV) = 9.38341E-07

Composite Exposure Rate Conversion Factor = 1.11005068 R/hr per Ci/m2
Composite ECF per FGR table = 1.23227739 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.822137356 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.71947491 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	1.3701E+21	1.8226E+07	0.0521	0.3947	0.0000	0.0000
Np-239	2.3550	d	0.17	2.7055E+22	2.4910E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.3787E+21	3.0127E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	7.5014E+20	2.7685E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	3.9815E+19	1.9131E+05	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5506E+18	80.05	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0285E+17	1.072	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	9.4929E+13	0.9696	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	1.9623E+12	0.9674	0.0092	0.0000	0.0000	6.5470
Po-214	0.16370E-03	s	0.12	8.4533E+06	0.9674	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.8074E+09	0.9674	0.0008	0.0000	0.0000	7.1280
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-239	24111.	y	0.05	4.1454E+20	1.0207E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.9804E+11	5.9808E-03	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	2.8575E+13	5.8287E-03	0.0225	0.0794	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Pu-240	6563.1	y	0.08	2.6350E+19	2.3834E-03	0.0000	0.0000	0.0000	5.1550
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	8.5361E+13	2.6489E-05	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	6.9255E+19	1.9211E-05	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	1.4897E+14	3.9906E-06	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	3.0175E+11	2.7160E-06	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.0011E+07	2.6716E-06	0.0160	0.8101	0.0000	0.0000
Pa-231	32771.	y	0.34	1.8443E+16	3.3410E-07	0.0394	0.0000	0.0000	4.9240
Ra-224	3.6400	d	0.82	3.0197E+09	1.7988E-07	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	5.2205E+05	1.7527E-07	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1403.	1.7526E-07	0.0000	0.0000	0.0000	6.7780
Np-238	2.1170	d	0.09	1.5404E+09	1.5777E-07	0.6470	0.2105	0.0000	0.0000
Pa-233	27.000	d	0.37	2.2014E+09	1.7678E-08	0.2175	0.0664	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.4963E+08	1.5125E-08	0.0004	0.3890	0.0000	4.6480
Np-240m	7.4000	m	2.70	2.5065E+05	1.0576E-08	0.3148	0.6243	0.0000	0.0000
Pb-212	10.640	h	0.09	1.2867E+07	6.2929E-09	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	2.8810E+05	1.4859E-09	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	1.5141E-05	9.5185E-10	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	4461.	4.5626E-10	3.3800	0.5598	0.0000	0.0000
Pa-234	6.7810	h	0.44	4.2672E+05	3.2747E-10	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	1.7890E+13	1.4087E-10	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	1.2197E+12	9.8655E-11	0.0340	0.0000	0.0000	4.9210
Po-210	138.40	d	0.00	9.4052E+05	1.4735E-12	0.0000	0.0000	0.0000	5.3040
Ac-227	21.770	y	0.01	3.8334E+07	1.0453E-12	0.0002	0.0097	0.0000	0.0702
Np-235	1.0840	y	0.28	1.6188E+06	8.8651E-13	0.0001	0.0000	0.0000	0.0001
Pu-238	87.712	y	0.34	3.6563E+07	2.4746E-13	0.0018	0.0099	0.0000	5.4860
Ra-225	14.800	d	1.35	1.1285E+04	1.6533E-13	0.0137	0.0970	0.0000	0.0000
Pa-232	1.3100	d	1.53	609.7	1.0092E-13	0.9334	0.0935	0.0000	0.0000
Fr-223	21.800	m	1.84	0.5736	8.2157E-15	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	178.5	2.0677E-15	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	12.68	2.7488E-16	0.0176	0.0000	0.0000	5.7880

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.14868E+07

Total number of decays = 2.80463E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.55194E-03
Average chain length = 11.185

Average gamma E (MeV) = 7.70748E-02
Average beta E (MeV) = 0.35216
Average alpha E (MeV) = 1.67903E-06

Composite Exposure Rate Conversion Factor = 1.28975320 R/hr per Ci/m2
Composite ECF per FGR table = 1.44253898 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.963435531 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.14745688 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	6.4177E+20	8.5376E+06	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	2.7640E+22	2.5448E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.3616E+21	3.0072E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.3452E+20	2.7108E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	4.3930E+19	2.1108E+05	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5460E+18	79.81	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0279E+17	1.072	0.0029	0.0000	0.0000
Th-226	30.570	m	0.33	9.9349E+13	1.015	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	2.0558E+12	1.013	0.0092	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	8.8562E+06	1.013	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.8935E+09	1.013	0.0008	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	5.5832E+20	1.3747E-02	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	7.5326E+11	9.0458E-03	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	3.5483E+13	7.2376E-03	0.0225	0.0794	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.7853E+19	3.4238E-03	0.0000	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	1.0661E+14	3.3082E-05	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	8.6413E+19	2.3971E-05	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	2.0556E+14	5.5066E-06	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	3.7677E+11	3.3911E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.2541E+07	3.3468E-06	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	2.3000E+16	4.1665E-07	0.0394	0.0000	0.0000
Ra-224	3.6400	d	0.82	4.7047E+09	2.8025E-07	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	8.1758E+05	2.7449E-07	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	2198.	2.7447E-07	0.0000	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5315E+09	1.5685E-07	0.6470	0.2105	0.0000
Pa-233	27.000	d	0.37	3.4310E+09	2.7553E-08	0.2175	0.0664	0.0000
Bi-210	5.0120	d	0.10	6.1882E+08	2.6771E-08	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	2.5064E+07	1.2259E-08	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	6.6937E+05	3.4522E-09	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	3.5178E-05	2.2115E-09	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	1.0703E+04	1.0946E-09	3.3800	0.5598	0.0000
Np-240m	7.4000	m	2.70	2.2618E+04	9.5433E-10	0.3148	0.6243	0.0000
Pa-234	6.7810	h	0.44	6.6043E+05	5.0682E-10	1.9000	0.2120	0.0000
Th-230	75392.	y	0.40	2.2343E+13	1.7594E-10	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.5232E+12	1.2321E-10	0.0340	0.0000	0.0000
Po-210	138.40	d	0.00	2.1169E+06	3.3165E-12	0.0000	0.0000	0.0000
Ac-227	21.770	y	0.01	5.9734E+07	1.6289E-12	0.0002	0.0097	0.0000
Np-235	1.0840	y	0.28	1.6187E+06	8.8648E-13	0.0001	0.0000	0.0000
Pu-238	87.712	y	0.34	4.5531E+07	3.0816E-13	0.0018	0.0099	0.0000
Ra-225	14.800	d	1.35	1.7597E+04	2.5780E-13	0.0137	0.0970	0.0000
Pa-232	1.3100	d	1.53	604.0	9.9974E-14	0.9334	0.0935	0.0000
Fr-223	21.800	m	1.84	0.9879	1.4149E-14	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	251.5	2.9134E-15	0.1595	0.0000	0.0000
Ac-225	10.000	d	1.00	24.65	5.3457E-16	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 1.18654E+07

Total number of decays = 2.89626E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.60265E-03
Average chain length = 11.185

Average gamma E (MeV) = 9.97929E-02
Average beta E (MeV) = 0.31634
Average alpha E (MeV) = 3.14917E-06

Composite Exposure Rate Conversion Factor = 1.65268886 R/hr per Ci/m2
Composite ECF per FGR table = 1.86624861 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.24741101 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.68196177 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-239	23.470	m	0.21	2.4891E+20	3.3113E+06	0.0521	0.3947	0.0000
Np-239	2.3550	d	0.17	2.7851E+22	2.5642E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.3402E+21	3.0003E+05	0.1440	0.0678	0.0000
U-240	14.100	h	1.42	7.1547E+20	2.6405E+05	0.0073	0.1070	0.0000
Np-240	1.0830	h	4.62	4.7323E+19	2.2738E+05	1.1900	0.2828	0.0000
U-231	4.2000	d	2.38	1.5403E+18	79.52	0.0824	0.0000	0.0000
U-230	20.800	d	10.09	1.0272E+17	1.071	0.0029	0.0000	0.0000
Th-226	30.570	m	0.33	1.0220E+14	1.044	0.0085	0.0000	0.0000
Ra-222	38.000	s	1.32	2.1162E+12	1.043	0.0092	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.1164E+06	1.043	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.9491E+09	1.043	0.0008	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	7.4039E+20	1.8230E-02	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	1.1000E+12	1.3210E-02	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	4.3997E+13	8.9744E-03	0.0225	0.0794	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
Pu-240	6563.1	y	0.08	5.3508E+19	4.8399E-03	0.0000	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	1.3314E+14	4.1315E-05	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.0780E+20	2.9903E-05	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	2.7890E+14	7.4714E-06	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	4.7039E+11	4.2338E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.5699E+07	4.1895E-06	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	2.8673E+16	5.1941E-07	0.0394	0.0000	0.0000
Ra-224	3.6400	d	0.82	7.3277E+09	4.3649E-07	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	1.2787E+06	4.2930E-07	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	3437.	4.2928E-07	0.0000	0.0000	0.0000
Np-238	2.1170	d	0.09	1.5203E+09	1.5572E-07	0.6470	0.2105	0.0000
Bi-210	5.0120	d	0.10	1.0779E+09	4.6631E-08	0.0004	0.3890	0.0000
Pa-233	27.000	d	0.37	5.3464E+09	4.2935E-08	0.2175	0.0664	0.0000
Pb-212	10.640	h	0.09	4.8659E+07	2.3798E-08	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	1.5342E+06	7.9124E-09	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	8.0628E-05	5.0687E-09	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	2.5174E+04	2.5746E-09	3.3800	0.5598	0.0000
Pa-234	6.7810	h	0.44	1.0173E+06	7.8072E-10	1.9000	0.2120	0.0000
Th-230	75392.	y	0.40	2.7905E+13	2.1973E-10	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.9024E+12	1.5388E-10	0.0340	0.0000	0.0000
Np-240m	7.4000	m	2.70	1122.	4.7325E-11	0.3148	0.6243	0.0000
Po-210	138.40	d	0.00	4.6940E+06	7.3539E-12	0.0000	0.0000	0.0000
Ac-227	21.770	y	0.01	9.3059E+07	2.5376E-12	0.0002	0.0097	0.0000
Np-235	1.0840	y	0.28	1.6187E+06	8.8645E-13	0.0001	0.0000	0.0000
Ra-225	14.800	d	1.35	2.7438E+04	4.0197E-13	0.0137	0.0970	0.0000
Pu-238	87.712	y	0.34	5.6657E+07	3.8347E-13	0.0018	0.0099	0.0000
Pa-232	1.3100	d	1.53	596.9	9.8803E-14	0.9334	0.0935	0.0000
Fr-223	21.800	m	1.84	1.676	2.4008E-14	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	396.6	4.5942E-15	0.1595	0.0000	0.0000
Ac-225	10.000	d	1.00	47.87	1.0380E-15	0.0176	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 6.66707E+06

Total number of decays = 2.95937E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.63757E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14015
Average beta E (MeV) = 0.25447
Average alpha E (MeV) = 5.73137E-06

Composite Exposure Rate Conversion Factor = 2.30036736 R/hr per Ci/m2
Composite ECF per FGR table = 2.62094450 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.75192904 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.34950924 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.7795E+22	2.5591E+06	0.1740	0.1079	0.0000	0.0000
U-239	23.470	m	0.21	7.6263E+19	1.0146E+06	0.0521	0.3947	0.0000	0.0000
U-237	6.7500	d	0.15	9.3136E+21	2.9917E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	6.9237E+20	2.5553E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	4.9644E+19	2.3854E+05	1.1900	0.2828	0.0000	0.0000
U-231	4.2000	d	2.38	1.5333E+18	79.16	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0262E+17	1.070	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	1.0374E+14	1.060	0.0085	0.0000	0.0000	6.3060
Ra-222	38.000	s	1.32	2.1488E+12	1.059	0.0092	0.0000	0.0000	6.5470
Po-214	0.16370E-03	s	0.12	9.2568E+06	1.059	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9792E+09	1.059	0.0008	0.0000	0.0000	7.1280
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-239	24111.	y	0.05	9.6831E+20	2.3842E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	1.5538E+12	1.8659E-02	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	5.4459E+13	1.1108E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	7.4285E+19	6.7192E-03	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	1.6628E+14	5.1598E-05	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.3444E+20	3.7293E-05	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	3.7250E+14	9.9786E-06	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	5.8724E+11	5.2855E-06	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.9640E+07	5.2412E-06	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.1409E+10	6.7962E-07	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.9976E+06	6.7065E-07	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	5370.	6.7062E-07	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	3.5728E+16	6.4722E-07	0.0394	0.0000	0.0000	4.9240
Np-238	2.1170	d	0.09	1.5066E+09	1.5430E-07	0.6470	0.2105	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.8479E+09	7.9941E-08	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	8.3292E+09	6.6888E-08	0.2175	0.0664	0.0000	0.0000
Pb-212	10.640	h	0.09	9.4132E+07	4.6038E-08	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	3.4641E+06	1.7866E-08	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	1.8205E-04	1.1445E-08	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	5.8038E+04	5.9355E-09	3.3800	0.5598	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.5590E+06	1.1964E-09	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	3.4850E+13	2.7442E-10	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	2.3759E+12	1.9218E-10	0.0340	0.0000	0.0000	4.9210
Po-210	138.40	d	0.00	1.0250E+07	1.6058E-11	0.0000	0.0000	0.0000	5.3040
Ac-227	21.770	y	0.01	1.4493E+08	3.9520E-12	0.0002	0.0097	0.0000	0.0702
Np-240m	7.4000	m	2.70	26.33	1.1111E-12	0.3148	0.6243	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6186E+06	8.8640E-13	0.0001	0.0000	0.0000	0.0001
Ra-225	14.800	d	1.35	4.2777E+04	6.2671E-13	0.0137	0.0970	0.0000	0.0000
Pu-238	87.712	y	0.34	7.0440E+07	4.7675E-13	0.0018	0.0099	0.0000	5.4860
Pa-232	1.3100	d	1.53	588.2	9.7359E-14	0.9334	0.0935	0.0000	0.0000
Fr-223	21.800	m	1.84	2.805	4.0169E-14	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	678.1	7.8540E-15	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	93.14	2.0195E-15	0.0176	0.0000	0.0000	5.7880

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 4.36701E+06

Total number of decays = 3.00647E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.66363E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.18937
Average beta E (MeV) = 0.18128
Average alpha E (MeV) = 8.85877E-06

Composite Exposure Rate Conversion Factor = 3.09313869 R/hr per Ci/m2
Composite ECF per FGR table = 3.54343390 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.36707044 Rem/hr per Ci/m2

Actinide Source

Point in time = 4.18320704 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.7571E+22	2.5385E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.2804E+21	2.9811E+05	0.1440	0.0678	0.0000	0.0000
U-240	14.100	h	1.42	6.6457E+20	2.4527E+05	0.0073	0.1070	0.0000	0.0000
Np-240	1.0830	h	4.62	5.0623E+19	2.4324E+05	1.1900	0.2828	0.0000	0.0000
U-239	23.470	m	0.21	1.7407E+19	2.3157E+05	0.0521	0.3947	0.0000	0.0000
U-231	4.2000	d	2.38	1.5245E+18	78.70	0.0824	0.0000	0.0000	0.0002
U-230	20.800	d	10.09	1.0250E+17	1.069	0.0029	0.0000	0.0000	5.8680
Th-226	30.570	m	0.33	1.0437E+14	1.066	0.0085	0.0000	0.0000	6.3060
Po-214	0.16370E-03	s	0.12	9.3143E+06	1.066	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9915E+09	1.066	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.1622E+12	1.066	0.0092	0.0000	0.0000	6.5470
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-239	24111.	y	0.05	1.2514E+21	3.0812E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	2.1308E+12	2.5588E-02	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	6.7261E+13	1.3720E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.0111E+20	9.1455E-03	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	2.0766E+14	6.4440E-05	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	1.6760E+20	4.6493E-05	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	4.9058E+14	1.3142E-05	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	7.3304E+11	6.5978E-06	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.4558E+07	6.5535E-06	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.7757E+10	1.0577E-06	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	3.1172E+06	1.0465E-06	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	8379.	1.0465E-06	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	4.4494E+16	8.0602E-07	0.0394	0.0000	0.0000	4.9240
Np-238	2.1170	d	0.09	1.4895E+09	1.5256E-07	0.6470	0.2105	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.1197E+09	1.3496E-07	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	1.2972E+10	1.0417E-07	0.2175	0.0664	0.0000	0.0000
Pb-212	10.640	h	0.09	1.8140E+08	8.8717E-08	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	7.6941E+06	3.9681E-08	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	4.0436E-04	2.5420E-08	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.3107E+05	1.3405E-08	3.3800	0.5598	0.0000	0.0000
Pa-234	6.7810	h	0.44	2.3748E+06	1.8224E-09	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	4.3525E+13	3.4272E-10	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	2.9672E+12	2.4001E-10	0.0340	0.0000	0.0000	4.9210
Po-210	138.40	d	0.00	2.2041E+07	3.4531E-11	0.0000	0.0000	0.0000	5.3040
Ac-227	21.770	y	0.01	2.2563E+08	6.1525E-12	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	6.6686E+04	9.7698E-13	0.0137	0.0970	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6185E+06	8.8635E-13	0.0001	0.0000	0.0000	0.0001
Pu-238	87.712	y	0.34	8.7478E+07	5.9207E-13	0.0018	0.0099	0.0000	5.4860
Pa-232	1.3100	d	1.53	577.5	9.5586E-14	0.9334	0.0935	0.0000	0.0000
Fr-223	21.800	m	1.84	4.633	6.6352E-14	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	1227.	1.4211E-14	0.1595	0.0000	0.0000	5.8900
Np-240m	7.4000	m	2.70	0.2430	1.0254E-14	0.3148	0.6243	0.0000	0.0000
Ac-225	10.000	d	1.00	181.1	3.9268E-15	0.0176	0.0000	0.0000	5.7880

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.55676E+06

Total number of decays = 3.04945E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.68741E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.22153
Average beta E (MeV) = 0.13511
Average alpha E (MeV) = 1.09392E-05

Composite Exposure Rate Conversion Factor = 3.61230564 R/hr per Ci/m2
Composite ECF per FGR table = 4.14787197 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.76917410 Rem/hr per Ci/m2

Actinide Source

Point in time = 5.22441292 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.7236E+22	2.5076E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	9.2391E+21	2.9678E+05	0.1440	0.0678	0.0000
Np-240	1.0830	h	4.62	5.0135E+19	2.4090E+05	1.1900	0.2828	0.0000
U-240	14.100	h	1.42	6.3141E+20	2.3303E+05	0.0073	0.1070	0.0000
U-239	23.470	m	0.21	2.7507E+18	3.6594E+04	0.0521	0.3947	0.0000
U-231	4.2000	d	2.38	1.5136E+18	78.14	0.0824	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.3254E+06	1.067	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.9938E+09	1.067	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.1647E+12	1.067	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.0449E+14	1.067	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	1.0235E+17	1.067	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-239	24111.	y	0.05	1.6014E+21	3.9429E-02	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	2.8508E+12	3.4235E-02	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	8.2848E+13	1.6899E-02	0.0225	0.0794	0.0000
Pu-240	6563.1	y	0.08	1.3476E+20	1.2189E-02	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	2.5934E+14	8.0477E-05	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	2.0885E+20	5.7936E-05	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	6.3854E+14	1.7106E-05	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	9.1492E+11	8.2349E-06	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.0692E+07	8.1907E-06	0.0160	0.8101	0.0000
Ra-224	3.6400	d	0.82	2.7620E+10	1.6452E-06	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	4.8590E+06	1.6313E-06	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.3062E+04	1.6313E-06	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	5.5373E+16	1.0031E-06	0.0394	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.1924E+09	2.2463E-07	0.0004	0.3890	0.0000
Pb-212	10.640	h	0.09	3.4805E+08	1.7022E-07	0.1437	0.0998	0.0000
Pa-233	27.000	d	0.37	2.0196E+10	1.6219E-07	0.2175	0.0664	0.0000
Np-238	2.1170	d	0.09	1.4685E+09	1.5041E-07	0.6470	0.2105	0.0000
Bi-212	1.0090	h	0.10	1.6786E+07	8.6574E-08	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	8.8220E-04	5.5460E-08	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	2.8979E+05	2.9637E-08	3.3800	0.5598	0.0000
Pa-234	6.7810	h	0.44	3.5927E+06	2.7571E-09	1.9000	0.2120	0.0000
Th-230	75392.	y	0.40	5.4358E+13	4.2802E-10	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	3.7058E+12	2.9975E-10	0.0340	0.0000	0.0000
Po-210	138.40	d	0.00	4.6701E+07	7.3164E-11	0.0000	0.0000	0.0000
Ac-227	21.770	y	0.01	3.5109E+08	9.5738E-12	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	1.0394E+05	1.5228E-12	0.0137	0.0970	0.0000
Np-235	1.0840	y	0.28	1.6184E+06	8.8628E-13	0.0001	0.0000	0.0000
Pu-238	87.712	y	0.34	1.0849E+08	7.3426E-13	0.0018	0.0099	0.0000
Fr-223	21.800	m	1.84	7.566	1.0837E-13	0.0634	0.3427	0.0000
Pa-232	1.3100	d	1.53	564.4	9.3417E-14	0.9334	0.0935	0.0000
Th-227	18.720	d	0.03	2290.	2.6530E-14	0.1595	0.0000	0.0000
Ac-225	10.000	d	1.00	352.3	7.6386E-15	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	1.2321E-05	7.1463E-15	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.31500E+06

Total number of decays = 3.09672E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.71357E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.23208
Average beta E (MeV) = 0.12012
Average alpha E (MeV) = 1.17627E-05

Composite Exposure Rate Conversion Factor = 3.77934194 R/hr per Ci/m2
Composite ECF per FGR table = 4.34544945 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.90099192 Rem/hr per Ci/m2

Actinide Source

Point in time = 6.52478266 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.6807E+22	2.4682E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.1879E+21	2.9514E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	4.8236E+19	2.3177E+05	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	5.9231E+20	2.1860E+05	0.0073	0.1070	0.0000	0.0000
U-239	23.470	m	0.21	2.7461E+17	3653.	0.0521	0.3947	0.0000	0.0000
U-231	4.2000	d	2.38	1.5002E+18	77.45	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	9.3151E+06	1.066	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9916E+09	1.066	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.1623E+12	1.066	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0437E+14	1.066	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.0217E+17	1.065	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-239	24111.	y	0.05	2.0323E+21	5.0039E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	3.7400E+12	4.4913E-02	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	1.0170E+14	2.0745E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	1.7576E+20	1.5897E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	3.2388E+14	1.0051E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.6012E+20	7.2156E-05	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	8.2330E+14	2.2055E-05	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	1.1418E+12	1.0277E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	3.8343E+07	1.0232E-05	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	4.2933E+10	2.5574E-06	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	7.5658E+06	2.5401E-06	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.0338E+04	2.5400E-06	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	6.8850E+16	1.2472E-06	0.0394	0.0000	0.0000	4.9240
Bi-210	5.0120	d	0.10	8.5331E+09	3.6915E-07	0.0004	0.3890	0.0000	4.6480
Pb-212	10.640	h	0.09	6.6449E+08	3.2499E-07	0.1437	0.0998	0.0000	0.0000
Pa-233	27.000	d	0.37	3.1428E+10	2.5239E-07	0.2175	0.0664	0.0000	0.0000
Bi-212	1.0090	h	0.10	3.5929E+07	1.8530E-07	0.1040	0.3164	0.0000	2.1750
Np-238	2.1170	d	0.09	1.4427E+09	1.4776E-07	0.6470	0.2105	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	1.8882E-03	1.1870E-07	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	6.2681E+05	6.4103E-08	3.3800	0.5598	0.0000	0.0000
Pa-234	6.7810	h	0.44	5.3922E+06	4.1380E-09	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	6.7888E+13	5.3456E-10	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	4.6281E+12	3.7436E-10	0.0340	0.0000	0.0000	4.9210
Po-210	138.40	d	0.00	9.7586E+07	1.5288E-10	0.0000	0.0000	0.0000	5.3040
Ac-227	21.770	y	0.01	5.4601E+08	1.4889E-11	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	1.6199E+05	2.3732E-12	0.0137	0.0970	0.0000	0.0000
Pu-238	87.712	y	0.34	1.3431E+08	9.0902E-13	0.0018	0.0099	0.0000	5.4860
Np-235	1.0840	y	0.28	1.6182E+06	8.8620E-13	0.0001	0.0000	0.0000	0.0001
Fr-223	21.800	m	1.84	12.24	1.7528E-13	0.0634	0.3427	0.0000	0.0000
Pa-232	1.3100	d	1.53	548.4	9.0777E-14	0.9334	0.0935	0.0000	0.0000
Th-227	18.720	d	0.03	4356.	5.0456E-14	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	685.1	1.4855E-14	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	0.2210	1.4081E-14	0.0287	0.0000	0.0000	6.3590

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.21741E+06

Total number of decays = 3.15319E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.74482E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.23297
Average beta E (MeV) = 0.11708
Average alpha E (MeV) = 1.21286E-05

Composite Exposure Rate Conversion Factor = 3.78485799 R/hr per Ci/m2
Composite ECF per FGR table = 4.35901546 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.91214204 Rem/hr per Ci/m2

Actinide Source

Point in time = 8.14881039 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.6279E+22	2.4195E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.1243E+21	2.9309E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	4.5129E+19	2.1685E+05	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	5.4686E+20	2.0183E+05	0.0073	0.1070	0.0000	0.0000
U-239	23.470	m	0.21	1.5450E+16	205.5	0.0521	0.3947	0.0000	0.0000
U-231	4.2000	d	2.38	1.4835E+18	76.59	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	9.2953E+06	1.064	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9874E+09	1.064	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.1577E+12	1.064	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0415E+14	1.064	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.0194E+17	1.063	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3830E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-239	24111.	y	0.05	2.5609E+21	6.3055E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.8315E+12	5.8021E-02	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	1.2434E+14	2.5362E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.2431E+20	2.0289E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	4.0448E+14	1.2552E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	3.2374E+20	8.9805E-05	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	1.0537E+15	2.8226E-05	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	1.4246E+12	1.2822E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.7882E+07	1.2778E-05	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	6.6678E+10	3.9719E-06	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.1766E+07	3.9504E-06	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	3.1630E+04	3.9503E-06	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	8.5515E+16	1.5491E-06	0.0394	0.0000	0.0000	4.9240
Pb-212	10.640	h	0.09	1.2613E+09	6.1686E-07	0.1437	0.0998	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.3868E+10	5.9994E-07	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	4.8879E+10	3.9253E-07	0.2175	0.0664	0.0000	0.0000
Bi-212	1.0090	h	0.10	7.5364E+07	3.8868E-07	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	3.9607E-03	2.4899E-07	0.0000	0.0000	0.0000	8.7850
Np-238	2.1170	d	0.09	1.4111E+09	1.4452E-07	0.6470	0.2105	0.0000	0.0000
Tl-208	3.0530	m	0.13	1.3257E+06	1.3558E-07	3.3800	0.5598	0.0000	0.0000
Pa-234	6.7810	h	0.44	8.0178E+06	6.1530E-09	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	8.4785E+13	6.6761E-10	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	5.7801E+12	4.6754E-10	0.0340	0.0000	0.0000	4.9210
Po-210	138.40	d	0.00	2.0135E+08	3.1545E-10	0.0000	0.0000	0.0000	5.3040
Ac-227	21.770	y	0.01	8.4852E+08	2.3138E-11	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	2.5240E+05	3.6977E-12	0.0137	0.0970	0.0000	0.0000
Pu-238	87.712	y	0.34	1.6592E+08	1.1230E-12	0.0018	0.0099	0.0000	5.4860
Np-235	1.0840	y	0.28	1.6180E+06	8.8609E-13	0.0001	0.0000	0.0000	0.0001
Fr-223	21.800	m	1.84	19.63	2.8116E-13	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	8367.	9.6907E-14	0.1595	0.0000	0.0000	5.8900
Pa-232	1.3100	d	1.53	529.2	8.7584E-14	0.9334	0.0935	0.0000	0.0000
Ac-225	10.000	d	1.00	1332.	2.8879E-14	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	4.7701E-05	2.7666E-14	0.0002	0.0000	0.0000	7.0630

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.13157E+06

Total number of decays = 3.22185E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.78281E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.23079
Average beta E (MeV) = 0.11622
Average alpha E (MeV) = 1.24650E-05

Composite Exposure Rate Conversion Factor = 3.73492336 R/hr per Ci/m2
Composite ECF per FGR table = 4.31194925 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.88488603 Rem/hr per Ci/m2

Actinide Source

Point in time = 10.1770706 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.5633E+22	2.3601E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	9.0454E+21	2.9056E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	4.1080E+19	1.9739E+05	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	4.9496E+20	1.8267E+05	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.4630E+18	75.53	0.0824	0.0000	0.0000	0.0002
U-239	23.470	m	0.21	4.2465E+14	5.649	0.0521	0.3947	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.2693E+06	1.061	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9818E+09	1.061	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.1517E+12	1.061	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0386E+14	1.061	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.0165E+17	1.060	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3829E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Pu-239	24111.	y	0.05	3.2065E+21	7.8951E-02	0.0001	0.0000	0.0000	5.1000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-235m	26.000	m	7.69	6.1647E+12	7.4030E-02	0.0000	0.0000	0.0000	0.0000
Th-231	1.0630	d	0.04	1.5124E+14	3.0849E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	2.8026E+20	2.5350E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	5.0513E+14	1.5675E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	4.0258E+20	1.1168E-04	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	1.3406E+15	3.5914E-05	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	1.7770E+12	1.5994E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	5.9769E+07	1.5950E-05	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.0345E+11	6.1622E-06	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.8275E+07	6.1356E-06	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	4.9127E+04	6.1355E-06	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	1.0607E+17	1.9215E-06	0.0394	0.0000	0.0000	4.9240
Pb-212	10.640	h	0.09	2.3776E+09	1.1628E-06	0.1437	0.0998	0.0000	0.0000
Bi-210	5.0120	d	0.10	2.2323E+10	9.6572E-07	0.0004	0.3890	0.0000	4.6480
Bi-212	1.0090	h	0.10	1.5481E+08	7.9842E-07	0.1040	0.3164	0.0000	2.1750
Pa-233	27.000	d	0.37	7.5965E+10	6.1004E-07	0.2175	0.0664	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	8.1360E-03	5.1147E-07	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	2.7412E+06	2.8034E-07	3.3800	0.5598	0.0000	0.0000
Np-238	2.1170	d	0.09	1.3726E+09	1.4058E-07	0.6470	0.2105	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.1794E+07	9.0508E-09	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	1.0589E+14	8.3378E-10	0.0004	0.0000	0.0000	4.6640
Po-210	138.40	d	0.00	4.1079E+08	6.4357E-10	0.0000	0.0000	0.0000	5.3040
Th-229	7339.2	y	2.18	7.2188E+12	5.8391E-10	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	1.3174E+09	3.5925E-11	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	3.9316E+05	5.7600E-12	0.0137	0.0970	0.0000	0.0000
Pu-238	87.712	y	0.34	2.0443E+08	1.3836E-12	0.0018	0.0099	0.0000	5.4860
Np-235	1.0840	y	0.28	1.6178E+06	8.8596E-13	0.0001	0.0000	0.0000	0.0001
Fr-223	21.800	m	1.84	31.27	4.4780E-13	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	1.6135E+04	1.8689E-13	0.1595	0.0000	0.0000	5.8900
Pa-232	1.3100	d	1.53	506.0	8.3754E-14	0.9334	0.0935	0.0000	0.0000
Ac-225	10.000	d	1.00	2588.	5.6116E-14	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	0.8509	5.4220E-14	0.0287	0.0000	0.0000	6.3590

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 3.03079E+06

Total number of decays = 3.30508E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.82887E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.22724
Average beta E (MeV) = 0.11539
Average alpha E (MeV) = 1.28819E-05

Composite Exposure Rate Conversion Factor = 3.65770841 R/hr per Ci/m2
Composite ECF per FGR table = 4.23666906 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.84053969 Rem/hr per Ci/m2

Actinide Source

Point in time = 12.7101564 hrs

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.4849E+22	2.2879E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	8.9479E+21	2.8743E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	3.6339E+19	1.7461E+05	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	4.3701E+20	1.6129E+05	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.4377E+18	74.22	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	9.2367E+06	1.057	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9749E+09	1.057	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.1441E+12	1.057	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0349E+14	1.057	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.0130E+17	1.056	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3829E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Pu-239	24111.	y	0.05	3.9906E+21	9.8256E-02	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	7.7837E+12	9.3473E-02	0.0000	0.0000	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
U-239	23.470	m	0.21	4.7714E+12	6.3475E-02	0.0521	0.3947	0.0000	0.0000
Th-231	1.0630	d	0.04	1.8282E+14	3.7290E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1	y	0.08	3.4295E+20	3.1020E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	6.3083E+14	1.9576E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	5.0009E+20	1.3872E-04	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	1.6979E+15	4.5484E-05	0.0045	0.0061	0.0000	0.0000
Th-234	24.090	d	0.12	2.2159E+12	1.9945E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	7.4573E+07	1.9901E-05	0.0160	0.8101	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.6029E+11	9.5480E-06	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	2.8341E+07	9.5150E-06	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	7.6185E+04	9.5149E-06	0.0000	0.0000	0.0000	6.7780
Pa-231	32771.	y	0.34	1.3134E+17	2.3793E-06	0.0394	0.0000	0.0000	4.9240
Pb-212	10.640	h	0.09	4.4458E+09	2.1743E-06	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	3.1129E+08	1.6054E-06	0.1040	0.3164	0.0000	2.1750
Bi-210	5.0120	d	0.10	3.5637E+10	1.5417E-06	0.0004	0.3890	0.0000	4.6480
Po-212	0.29800E-06	s	1.01	1.6359E-02	1.0284E-06	0.0000	0.0000	0.0000	8.7850
Pa-233	27.000	d	0.37	1.1796E+11	9.4725E-07	0.2175	0.0664	0.0000	0.0000
Tl-208	3.0530	m	0.13	5.5400E+06	5.6657E-07	3.3800	0.5598	0.0000	0.0000
Np-238	2.1170	d	0.09	1.3259E+09	1.3580E-07	0.6470	0.2105	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.7135E+07	1.3149E-08	1.9000	0.2120	0.0000	0.0000
Po-210	138.40	d	0.00	8.2979E+08	1.3000E-09	0.0000	0.0000	0.0000	5.3040
Th-230	75392.	y	0.40	1.3224E+14	1.0413E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	9.0155E+12	7.2925E-10	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	2.0432E+09	5.5715E-11	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	6.1223E+05	8.9694E-12	0.0137	0.0970	0.0000	0.0000
Pu-238	87.712	y	0.34	2.5105E+08	1.6992E-12	0.0018	0.0099	0.0000	5.4860
Np-235	1.0840	y	0.28	1.6175E+06	8.8580E-13	0.0001	0.0000	0.0000	0.0001
Fr-223	21.800	m	1.84	49.49	7.0884E-13	0.0634	0.3427	0.0000	0.0000
Th-227	18.720	d	0.03	3.1176E+04	3.6110E-13	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	5026.	1.0898E-13	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	1.8279E-04	1.0602E-13	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	1.664	1.0602E-13	0.0287	0.0000	0.0000	6.3590

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.91129E+06

Total number of decays = 3.40531E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.88433E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.22274
Average beta E (MeV) = 0.11438
Average alpha E (MeV) = 1.34117E-05

Composite Exposure Rate Conversion Factor = 3.56046605 R/hr per Ci/m2
Composite ECF per FGR table = 4.14125156 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.78420234 Rem/hr per Ci/m2

Actinide Source

Point in time = 15.8737326 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.3904E+22	2.2008E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	8.8276E+21	2.8356E+05	0.1440	0.0678	0.0000
Np-240	1.0830	h	4.62	3.1119E+19	1.4953E+05	1.1900	0.2828	0.0000
U-240	14.100	h	1.42	3.7407E+20	1.3806E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.4068E+18	72.62	0.0824	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.1962E+06	1.052	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.9662E+09	1.052	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.1347E+12	1.052	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.0304E+14	1.052	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	1.0085E+17	1.051	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3829E+19	0.3727	0.0002	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
Pu-239	24111.	y	0.05	4.9362E+21	0.1215	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	9.7364E+12	0.1169	0.0000	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-231	1.0630	d	0.04	2.1933E+14	4.4737E-02	0.0225	0.0794	0.0000
Pu-240	6563.1	y	0.08	4.1111E+20	3.7186E-02	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	7.8779E+14	2.4446E-04	0.0031	0.0000	0.0000
U-239	23.470	m	0.21	1.7541E+10	2.3335E-04	0.0521	0.3947	0.0000
Np-237	0.21400E+07	y	0.47	6.2039E+20	1.7210E-04	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	2.1423E+15	5.7390E-05	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	2.7622E+12	2.4862E-05	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	9.3000E+07	2.4818E-05	0.0160	0.8101	0.0000
Ra-224	3.6400	d	0.82	2.4796E+11	1.4770E-05	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	4.3873E+07	1.4729E-05	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.1794E+05	1.4729E-05	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	8.2333E+09	4.0268E-06	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	6.1250E+08	3.1589E-06	0.1040	0.3164	0.0000
Pa-231	32771.	y	0.34	1.6230E+17	2.9401E-06	0.0394	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.6481E+10	2.4434E-06	0.0004	0.3890	0.0000
Po-212	0.29800E-06	s	1.01	3.2189E-02	2.0236E-06	0.0000	0.0000	0.0000
Pa-233	27.000	d	0.37	1.8295E+11	1.4692E-06	0.2175	0.0664	0.0000
Tl-208	3.0530	m	0.13	1.0944E+07	1.1193E-06	3.3800	0.5598	0.0000
Np-238	2.1170	d	0.09	1.2699E+09	1.3007E-07	0.6470	0.2105	0.0000
Pa-234	6.7810	h	0.44	2.4548E+07	1.8838E-08	1.9000	0.2120	0.0000
Po-210	138.40	d	0.00	1.6616E+09	2.6031E-09	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	1.6516E+14	1.3005E-09	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.1260E+13	9.1076E-10	0.0340	0.0000	0.0000
Ac-227	21.770	y	0.01	3.1644E+09	8.6288E-11	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	9.5298E+05	1.3961E-11	0.0137	0.0970	0.0000
Pu-238	87.712	y	0.34	3.0706E+08	2.0782E-12	0.0018	0.0099	0.0000
Fr-223	21.800	m	1.84	77.92	1.1160E-12	0.0634	0.3427	0.0000
Np-235	1.0840	y	0.28	1.6171E+06	8.8559E-13	0.0001	0.0000	0.0001
Th-227	18.720	d	0.03	6.0240E+04	6.9773E-13	0.1595	0.0000	0.0000
Ac-225	10.000	d	1.00	9753.	2.1147E-13	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	3.5666E-04	2.0686E-13	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.246	2.0686E-13	0.0287	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.77205E+06

Total number of decays = 3.52501E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 1.95057E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.21743
Average beta E (MeV) = 0.11318
Average alpha E (MeV) = 1.40837E-05

Composite Exposure Rate Conversion Factor = 3.44627309 R/hr per Ci/m2
Composite ECF per FGR table = 4.02900696 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.71788716 Rem/hr per Ci/m2

Actinide Source

Point in time = 19.8247452 hrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.2773E+22	2.0967E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	8.6796E+21	2.7881E+05	0.1440	0.0678	0.0000
Np-240	1.0830	h	4.62	2.5628E+19	1.2314E+05	1.1900	0.2828	0.0000
U-240	14.100	h	1.42	3.0803E+20	1.1368E+05	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.3690E+18	70.68	0.0824	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.1459E+06	1.047	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.9555E+09	1.047	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.1231E+12	1.047	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.0247E+14	1.047	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	1.0030E+17	1.046	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3829E+19	0.3727	0.0002	0.0000	0.0000
Pu-239	24111.	y	0.05	6.0668E+21	0.1494	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	1.2071E+13	0.1450	0.0000	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-231	1.0630	d	0.04	2.6073E+14	5.3182E-02	0.0225	0.0794	0.0000
Pu-240	6563.1	y	0.08	4.8264E+20	4.3656E-02	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	9.8379E+14	3.0529E-04	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	7.6837E+20	2.1314E-04	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	2.6946E+15	7.2185E-05	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	3.4416E+12	3.0977E-05	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.1591E+08	3.0933E-05	0.0160	0.8101	0.0000
Ra-224	3.6400	d	0.82	3.8280E+11	2.2803E-05	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	6.7770E+07	2.2752E-05	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.8218E+05	2.2752E-05	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	1.5077E+10	7.3736E-06	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	1.1790E+09	6.0805E-06	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	6.1961E-02	3.8951E-06	0.0000	0.0000	0.0000
Bi-210	5.0120	d	0.10	8.8939E+10	3.8476E-06	0.0004	0.3890	0.0000
Pa-231	32771.	y	0.34	2.0003E+17	3.6236E-06	0.0394	0.0000	0.0000
Pa-233	27.000	d	0.37	2.8338E+11	2.2757E-06	0.2175	0.0664	0.0000
Tl-208	3.0530	m	0.13	2.1132E+07	2.1612E-06	3.3800	0.5598	0.0000
U-239	23.470	m	0.21	1.5976E+07	2.1254E-07	0.0521	0.3947	0.0000
Np-238	2.1170	d	0.09	1.2033E+09	1.2324E-07	0.6470	0.2105	0.0000
Pa-234	6.7810	h	0.44	3.4631E+07	2.6576E-08	1.9000	0.2120	0.0000
Po-210	138.40	d	0.00	3.3016E+09	5.1725E-09	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	2.0627E+14	1.6242E-09	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.4062E+13	1.1374E-09	0.0340	0.0000	0.0000
Ac-227	21.770	y	0.01	4.8923E+09	1.3341E-10	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	1.4826E+06	2.1721E-11	0.0137	0.0970	0.0000
Pu-238	87.712	y	0.34	3.7370E+08	2.5293E-12	0.0018	0.0099	0.0000
Fr-223	21.800	m	1.84	122.1	1.7481E-12	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	1.1630E+05	1.3471E-12	0.1595	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6167E+06	8.8534E-13	0.0001	0.0000	0.0000
Ac-225	10.000	d	1.00	1.8909E+04	4.0999E-13	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	6.9453E-04	4.0282E-13	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	6.322	4.0282E-13	0.0287	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.61244E+06

Total number of decays = 3.66663E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.02893E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.21143
Average beta E (MeV) = 0.11182
Average alpha E (MeV) = 1.49375E-05

Composite Exposure Rate Conversion Factor = 3.31726074 R/hr per Ci/m2
Composite ECF per FGR table = 3.90212417 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.64290071 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.03163242 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	2.1436E+22	1.9736E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	8.4983E+21	2.7298E+05	0.1440	0.0678	0.0000
Np-240	1.0830	h	4.62	2.0108E+19	9.6618E+04	1.1900	0.2828	0.0000
U-240	14.100	h	1.42	2.4169E+20	8.9197E+04	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.3234E+18	68.32	0.0824	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.0835E+06	1.040	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.9421E+09	1.040	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.1086E+12	1.040	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.0178E+14	1.039	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	9.9616E+16	1.038	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3829E+19	0.3727	0.0002	0.0000	0.0000
Pu-239	24111.	y	0.05	7.4041E+21	0.1823	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	1.4832E+13	0.1781	0.0000	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Th-231	1.0630	d	0.04	3.0656E+14	6.2531E-02	0.0225	0.0794	0.0000
Pu-240	6563.1	y	0.08	5.5451E+20	5.0156E-02	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	1.2285E+15	3.8123E-04	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.4970E+20	2.6345E-04	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	3.3802E+15	9.0550E-05	0.0045	0.0061	0.0000
Th-234	24.090	d	0.12	4.2856E+12	3.8573E-05	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	1.4438E+08	3.8530E-05	0.0160	0.8101	0.0000
Ra-224	3.6400	d	0.82	5.8952E+11	3.5116E-05	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	1.0441E+08	3.5055E-05	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	2.8068E+05	3.5055E-05	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	2.7247E+10	1.3326E-05	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	2.2192E+09	1.1445E-05	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	0.1166	7.3318E-06	0.0000	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.3921E+11	6.0223E-06	0.0004	0.3890	0.0000
Pa-231	32771.	y	0.34	2.4574E+17	4.4517E-06	0.0394	0.0000	0.0000
Tl-208	3.0530	m	0.13	3.9874E+07	4.0779E-06	3.3800	0.5598	0.0000
Pa-233	27.000	d	0.37	4.3817E+11	3.5188E-06	0.2175	0.0664	0.0000
Np-238	2.1170	d	0.09	1.1250E+09	1.1522E-07	0.6470	0.2105	0.0000
Pa-234	6.7810	h	0.44	4.8054E+07	3.6877E-08	1.9000	0.2120	0.0000
Po-210	138.40	d	0.00	6.5151E+09	1.0207E-08	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	2.5761E+14	2.0285E-09	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	1.7562E+13	1.4206E-09	0.0340	0.0000	0.0000
Ac-227	21.770	y	0.01	7.5475E+09	2.0581E-10	0.0002	0.0097	0.0000
U-239	23.470	m	0.21	2547.	3.3888E-11	0.0521	0.3947	0.0000
Ra-225	14.800	d	1.35	2.3052E+06	3.3772E-11	0.0137	0.0970	0.0000
Pu-238	87.712	y	0.34	4.5203E+08	3.0594E-12	0.0018	0.0099	0.0000
Fr-223	21.800	m	1.84	190.3	2.7255E-12	0.0634	0.3427	0.0000
Th-227	18.720	d	0.03	2.2417E+05	2.5965E-12	0.1595	0.0000	0.0000
Np-235	1.0840	y	0.28	1.6161E+06	8.8502E-13	0.0001	0.0000	0.0000
Ac-225	10.000	d	1.00	3.6616E+04	7.9393E-13	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	12.29	7.8281E-13	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	1.3497E-03	7.8281E-13	0.0002	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 84
Total activity (Ci) = 2.43248E+06

Total number of decays = 3.83232E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.12061E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.20487
Average beta E (MeV) = 0.11031
Average alpha E (MeV) = 1.60270E-05

Composite Exposure Rate Conversion Factor = 3.17630672 R/hr per Ci/m2
Composite ECF per FGR table = 3.76344132 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.56091404 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.28840601 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Np-239	2.3550 d 0.17	1.9876E+22	1.8299E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500 d 0.15	8.2771E+21	2.6588E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830 h 4.62	1.4852E+19	7.1366E+04	1.1900	0.2828	0.0000	0.0000
U-240	14.100 h 1.42	1.7852E+20	6.5885E+04	0.0073	0.1070	0.0000	0.0000
U-231	4.2000 d 2.38	1.2685E+18	65.48	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03 s 0.12	9.0061E+06	1.031	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01 s 25.71	1.9256E+09	1.031	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000 s 1.32	2.0906E+12	1.031	0.0092	0.0000	0.0000	6.5470
Th-226	30.570 m 0.33	1.0091E+14	1.031	0.0085	0.0000	0.0000	6.3060
U-230	20.800 d 10.09	9.8767E+16	1.030	0.0029	0.0000	0.0000	5.8680
U-232	69.811 y 0.72	4.3828E+19	0.3727	0.0002	0.0000	0.0000	5.3030
Pu-239	24111. y 0.05	8.9644E+21	0.2207	0.0001	0.0000	0.0000	5.1000
U-235m	26.000 m 7.69	1.8054E+13	0.2168	0.0000	0.0000	0.0000	0.0000
U-235	0.70381E+09 y 0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06 y 0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Th-231	1.0630 d 0.04	3.5582E+14	7.2578E-02	0.0225	0.0794	0.0000	0.0000
Pu-240	6563.1 y 0.08	6.2293E+20	5.6345E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06 y 0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08 y 0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10 y 0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130 y 0.03	1.5341E+15	4.7606E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07 y 0.47	1.1709E+21	3.2479E-04	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160 y 0.54	4.2297E+15	1.1331E-04	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400 d 0.82	9.0509E+11	5.3914E-05	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800 s 0.54	1.6036E+08	5.3839E-05	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000 s 3.33	4.3108E+05	5.3839E-05	0.0000	0.0000	0.0000	6.7780
Th-234	24.090 d 0.12	5.3327E+12	4.7997E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700 m 2.56	1.7970E+08	4.7954E-05	0.0160	0.8101	0.0000	0.0000
Pb-212	10.640 h 0.09	4.8502E+10	2.3721E-05	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090 h 0.10	4.0825E+09	2.1055E-05	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06 s 1.01	0.2146	1.3488E-05	0.0000	0.0000	0.0000	8.7850
Bi-210	5.0120 d 0.10	2.1662E+11	9.3712E-06	0.0004	0.3890	0.0000	4.6480
Tl-208	3.0530 m 0.13	7.3493E+07	7.5161E-06	3.3800	0.5598	0.0000	0.0000
Pa-231	32771. y 0.34	3.0071E+17	5.4474E-06	0.0394	0.0000	0.0000	4.9240
Pa-233	27.000 d 0.37	6.7606E+11	5.4292E-06	0.2175	0.0664	0.0000	0.0000
Np-238	2.1170 d 0.09	1.0342E+09	1.0593E-07	0.6470	0.2105	0.0000	0.0000
Pa-234	6.7810 h 0.44	6.5552E+07	5.0306E-08	1.9000	0.2120	0.0000	0.0000
Po-210	138.40 d 0.00	1.2774E+10	2.0012E-08	0.0000	0.0000	0.0000	5.3040
Th-230	75392. y 0.40	3.2173E+14	2.5333E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2 y 2.18	2.1933E+13	1.7741E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770 y 0.01	1.1613E+10	3.1667E-10	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800 d 1.35	3.5812E+06	5.2467E-11	0.0137	0.0970	0.0000	0.0000
Th-227	18.720 d 0.03	4.3110E+05	4.9933E-12	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800 m 1.84	295.3	4.2291E-12	0.0634	0.3427	0.0000	0.0000
Pu-238	87.712 y 0.34	5.4274E+08	3.6734E-12	0.0018	0.0099	0.0000	5.4860
Ac-225	10.000 d 1.00	7.0801E+04	1.5351E-12	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000 m 4.08	23.82	1.5179E-12	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01 s 1.24	2.6172E-03	1.5179E-12	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580 m 0.13	199.8	1.3685E-12	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05 s 19.05	3.0022E-07	1.3391E-12	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021071D+26

Total number of nuclides = 84
Total activity (Ci) = 2.23315E+06

Total number of decays = 4.02363E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.22648E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.19798
Average beta E (MeV) = 0.10869
Average alpha E (MeV) = 1.74269E-05

Composite Exposure Rate Conversion Factor = 3.02823186 R/hr per Ci/m2
Composite ECF per FGR table = 3.61767149 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.47469711 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.60909343 day

Top 50 most active radionuclides

Isotope	Half-life +/- pct	Atoms	Curies	Total Energy Output (Mev)			
				gamma	beta(-)	beta(+)	alpha
Np-239	2.3550 d 0.17	1.8085E+22	1.6651E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500 d 0.15	8.0090E+21	2.5727E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830 h 4.62	1.0174E+19	4.8885E+04	1.1900	0.2828	0.0000	0.0000
U-240	14.100 h 1.42	1.2228E+20	4.5130E+04	0.0073	0.1070	0.0000	0.0000
U-231	4.2000 d 2.38	1.2031E+18	62.11	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03 s 0.12	8.9104E+06	1.020	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01 s 25.71	1.9051E+09	1.020	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000 s 1.32	2.0684E+12	1.020	0.0092	0.0000	0.0000	6.5470
Th-226	30.570 m 0.33	9.9835E+13	1.020	0.0085	0.0000	0.0000	6.3060
U-230	20.800 d 10.09	9.7717E+16	1.019	0.0029	0.0000	0.0000	5.8680
U-232	69.811 y 0.72	4.3828E+19	0.3727	0.0002	0.0000	0.0000	5.3030
Pu-239	24111. y 0.05	1.0755E+22	0.2648	0.0001	0.0000	0.0000	5.1000
U-235m	26.000 m 7.69	2.1751E+13	0.2612	0.0000	0.0000	0.0000	0.0000
U-235	0.70381E+09 y 0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630 d 0.04	4.0681E+14	8.2980E-02	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06 y 0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1 y 0.08	6.8384E+20	6.1855E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06 y 0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08 y 0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10 y 0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130 y 0.03	1.9156E+15	5.9446E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07 y 0.47	1.4390E+21	3.9917E-04	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160 y 0.54	5.2806E+15	1.4146E-04	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400 d 0.82	1.3844E+12	8.2464E-05	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800 s 0.54	2.4536E+08	8.2374E-05	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000 s 3.33	6.5956E+05	8.2373E-05	0.0000	0.0000	0.0000	6.7780
Th-234	24.090 d 0.12	6.6295E+12	5.9670E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700 m 2.56	2.2344E+08	5.9628E-05	0.0160	0.8101	0.0000	0.0000
Pb-212	10.640 h 0.09	8.4877E+10	4.1511E-05	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090 h 0.10	7.3350E+09	3.7830E-05	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06 s 1.01	0.3855	2.4234E-05	0.0000	0.0000	0.0000	8.7850
Bi-210	5.0120 d 0.10	3.3509E+11	1.4496E-05	0.0004	0.3890	0.0000	4.6480
Tl-208	3.0530 m 0.13	1.3224E+08	1.3524E-05	3.3800	0.5598	0.0000	0.0000
Pa-233	27.000 d 0.37	1.0404E+12	8.3546E-06	0.2175	0.0664	0.0000	0.0000
Pa-231	32771. y 0.34	3.6617E+17	6.6333E-06	0.0394	0.0000	0.0000	4.9240
Np-238	2.1170 d 0.09	9.3116E+08	9.5370E-08	0.6470	0.2105	0.0000	0.0000
Pa-234	6.7810 h 0.44	8.7931E+07	6.7479E-08	1.9000	0.2120	0.0000	0.0000
Po-210	138.40 d 0.00	2.4891E+10	3.8996E-08	0.0000	0.0000	0.0000	5.3040
Th-230	75392. y 0.40	4.0181E+14	3.1639E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2 y 2.18	2.7393E+13	2.2157E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770 y 0.01	1.7810E+10	4.8566E-10	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800 d 1.35	5.5583E+06	8.1431E-11	0.0137	0.0970	0.0000	0.0000
Th-227	18.720 d 0.03	8.2660E+05	9.5741E-12	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800 m 1.84	455.9	6.5299E-12	0.0634	0.3427	0.0000	0.0000
Pu-238	87.712 y 0.34	6.4583E+08	4.3711E-12	0.0018	0.0099	0.0000	5.4860
Ac-225	10.000 d 1.00	1.3665E+05	2.9630E-12	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000 m 4.08	46.08	2.9364E-12	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01 s 1.24	5.0629E-03	2.9364E-12	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580 m 0.13	394.5	2.7025E-12	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05 s 19.05	5.9287E-07	2.6444E-12	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 2.01648E+06

Total number of decays = 4.24119E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.34686E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.19107
Average beta E (MeV) = 0.10700
Average alpha E (MeV) = 1.92433E-05

Composite Exposure Rate Conversion Factor = 2.88019323 R/hr per Ci/m2
Composite ECF per FGR table = 3.47181058 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.38836145 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.00960112 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	1.6074E+22	1.4800E+06	0.1740	0.1079	0.0000
U-237	6.7500	d	0.15	7.6863E+21	2.4690E+05	0.1440	0.0678	0.0000
Np-240	1.0830	h	4.62	6.3426E+18	3.0476E+04	1.1900	0.2828	0.0000
U-240	14.100	h	1.42	7.6234E+19	2.8135E+04	0.0073	0.1070	0.0000
U-231	4.2000	d	2.38	1.1261E+18	58.14	0.0824	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	8.7922E+06	1.006	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1.8798E+09	1.006	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.0410E+12	1.006	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	9.8512E+13	1.006	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	9.6422E+16	1.005	0.0029	0.0000	0.0000
U-232	69.811	y	0.72	4.3828E+19	0.3727	0.0002	0.0000	0.0000
Pu-239	24111.	y	0.05	1.2766E+22	0.3143	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	2.5904E+13	0.3111	0.0000	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
Th-231	1.0630	d	0.04	4.5721E+14	9.3259E-02	0.0225	0.0794	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	7.3372E+20	6.6367E-02	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-228	1.9130	y	0.03	2.3920E+15	7.4227E-04	0.0031	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	1.7617E+21	4.8869E-04	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	6.5772E+15	1.7620E-04	0.0045	0.0061	0.0000
Ra-224	3.6400	d	0.82	2.1078E+12	1.2556E-04	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	3.7366E+08	1.2545E-04	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.0044E+06	1.2545E-04	0.0000	0.0000	0.0000
Th-234	24.090	d	0.12	8.2325E+12	7.4098E-05	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	2.7751E+08	7.4056E-05	0.0160	0.8101	0.0000
Pb-212	10.640	h	0.09	1.4575E+11	7.1282E-05	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	1.2862E+10	6.6335E-05	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	0.6760	4.2494E-05	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	2.3215E+08	2.3742E-05	3.3800	0.5598	0.0000
Bi-210	5.0120	d	0.10	5.1510E+11	2.2284E-05	0.0004	0.3890	0.0000
Pa-233	27.000	d	0.37	1.5957E+12	1.2814E-05	0.2175	0.0664	0.0000
Pa-231	32771.	y	0.34	4.4324E+17	8.0293E-06	0.0394	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.1610E+08	8.9094E-08	1.9000	0.2120	0.0000
Np-238	2.1170	d	0.09	8.1672E+08	8.3649E-08	0.6470	0.2105	0.0000
Po-210	138.40	d	0.00	4.8206E+10	7.5522E-08	0.0000	0.0000	0.0000
Th-230	75392.	y	0.40	5.0182E+14	3.9514E-09	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	3.4211E+13	2.7672E-09	0.0340	0.0000	0.0000
Ac-227	21.770	y	0.01	2.7206E+10	7.4187E-10	0.0002	0.0097	0.0000
Ra-225	14.800	d	1.35	8.6163E+06	1.2623E-10	0.0137	0.0970	0.0000
Th-227	18.720	d	0.03	1.5790E+06	1.8289E-11	0.1595	0.0000	0.0000
Fr-223	21.800	m	1.84	700.2	1.0029E-11	0.0634	0.3427	0.0000
Ac-225	10.000	d	1.00	2.6315E+05	5.7058E-12	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	88.90	5.6650E-12	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	9.7674E-03	5.6650E-12	0.0002	0.0000	0.0000
Bi-213	45.580	m	0.13	773.8	5.3010E-12	0.0831	0.4240	0.0000
Po-213	0.42000E-05	s	19.05	1.1629E-06	5.1871E-12	0.0000	0.0000	0.0000
Pu-238	87.712	y	0.34	7.6026E+08	5.1456E-12	0.0018	0.0099	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 1.78554E+06

Total number of decays = 4.48417E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.48131E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.18456
Average beta E (MeV) = 0.10532
Average alpha E (MeV) = 2.16336E-05

Composite Exposure Rate Conversion Factor = 2.74112177 R/hr per Ci/m2
Composite ECF per FGR table = 3.33458185 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.30703259 Rem/hr per Ci/m2

Actinide Source

Point in time = 2.50979114 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	1.3874E+22	1.2774E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	7.3015E+21	2.3454E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	3.5154E+18	1.6891E+04	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	4.2253E+19	1.5594E+04	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	1.0369E+18	53.53	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	8.6469E+06	0.9895	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.8488E+09	0.9895	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.0072E+12	0.9895	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	9.6883E+13	0.9895	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	9.4828E+16	0.9885	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3827E+19	0.3727	0.0002	0.0000	0.0000	5.3030
Pu-239	24111.	y	0.05	1.4966E+22	0.3685	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	3.0448E+13	0.3656	0.0000	0.0000	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	5.0420E+14	0.1028	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	7.7053E+20	6.9696E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	2.9866E+15	9.2678E-04	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.1465E+21	5.9545E-04	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	8.1725E+15	2.1893E-04	0.0045	0.0061	0.0000	0.0000
Ra-224	3.6400	d	0.82	3.1914E+12	1.9010E-04	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	5.6585E+08	1.8997E-04	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1.5211E+06	1.8997E-04	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	2.4519E+11	1.1992E-04	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	2.1998E+10	1.1345E-04	0.1040	0.3164	0.0000	2.1750
Th-234	24.090	d	0.12	1.0209E+13	9.1884E-05	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	3.4416E+08	9.1843E-05	0.0160	0.8101	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	1.156	7.2679E-05	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	3.9741E+08	4.0642E-05	3.3800	0.5598	0.0000	0.0000
Bi-210	5.0120	d	0.10	7.8637E+11	3.4019E-05	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	2.4375E+12	1.9574E-05	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	5.3262E+17	9.6485E-06	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	9.2762E+10	1.4533E-07	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	1.5112E+08	1.1597E-07	1.9000	0.2120	0.0000	0.0000
Np-238	2.1170	d	0.09	6.9334E+08	7.1013E-08	0.6470	0.2105	0.0000	0.0000
Th-230	75392.	y	0.40	6.2672E+14	4.9349E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	4.2726E+13	3.4560E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	4.1356E+10	1.1277E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	1.3337E+07	1.9539E-10	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	3.0023E+06	3.4774E-11	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800	m	1.84	1069.	1.5311E-11	0.0634	0.3427	0.0000	0.0000
Ac-225	10.000	d	1.00	5.0533E+05	1.0957E-11	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	171.0	1.0894E-11	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	1.8783E-02	1.0894E-11	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	1508.	1.0331E-11	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	2.2665E-06	1.0109E-11	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	5167.	8.2657E-12	0.0001	0.1975	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 83
Total activity (Ci) = 1.54445E+06

Total number of decays = 4.74979E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.62830E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.17887
Average beta E (MeV) = 0.10371
Average alpha E (MeV) = 2.48409E-05

Composite Exposure Rate Conversion Factor = 2.62002611 R/hr per Ci/m2
Composite ECF per FGR table = 3.21476936 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.23586249 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.13448501 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	1.1544E+22	1.0628E+06	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	6.8478E+21	2.1997E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	1.6822E+18	8083.	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	2.0219E+19	7462.	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	9.3532E+17	48.29	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	8.4687E+06	0.9692	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.8107E+09	0.9692	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.9659E+12	0.9692	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	9.4887E+13	0.9691	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	9.2874E+16	0.9681	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	1.7296E+22	0.4259	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	3.5259E+13	0.4234	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3826E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	5.4498E+14	0.1112	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	7.9440E+20	7.1855E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-228	1.9130	y	0.03	3.7287E+15	1.1571E-03	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	2.6002E+21	7.2129E-04	0.0320	0.0000	0.0000	4.7900
Ra-224	3.6400	d	0.82	4.7995E+12	2.8590E-04	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	8.5111E+08	2.8574E-04	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.2879E+06	2.8574E-04	0.0000	0.0000	0.0000	6.7780
Pb-210	22.160	y	0.54	1.0128E+16	2.7131E-04	0.0045	0.0061	0.0000	0.0000
Pb-212	10.640	h	0.09	4.0364E+11	1.9741E-04	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	3.6685E+10	1.8920E-04	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	1.928	1.2120E-04	0.0000	0.0000	0.0000	8.7850
Th-234	24.090	d	0.12	1.2637E+13	1.1374E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.2607E+08	1.1370E-04	0.0160	0.8101	0.0000	0.0000
Tl-208	3.0530	m	0.13	6.6318E+08	6.7823E-05	3.3800	0.5598	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.1911E+12	5.1530E-05	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	3.7046E+12	2.9750E-05	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	6.3441E+17	1.1492E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	1.7727E+11	2.7772E-07	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	1.9430E+08	1.4911E-07	1.9000	0.2120	0.0000	0.0000
Np-238	2.1170	d	0.09	5.6509E+08	5.7877E-08	0.6470	0.2105	0.0000	0.0000
Th-230	75392.	y	0.40	7.8271E+14	6.1632E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	5.3360E+13	4.3162E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	6.2494E+10	1.7041E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	2.0604E+07	3.0186E-10	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	5.6761E+06	6.5744E-11	0.1595	0.0000	0.0000	5.8900
Fr-223	21.800	m	1.84	1621.	2.3217E-11	0.0634	0.3427	0.0000	0.0000
Ac-225	10.000	d	1.00	9.6698E+05	2.0967E-11	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	327.5	2.0871E-11	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	3.5986E-02	2.0871E-11	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	2921.	2.0006E-11	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	4.3890E-06	1.9577E-11	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.0460E+04	1.6732E-11	0.0001	0.1975	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 83
Total activity (Ci) = 1.29839E+06

Total number of decays = 5.03277E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.78489E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.17428
Average beta E (MeV) = 0.10219
Average alpha E (MeV) = 2.92584E-05

Composite Exposure Rate Conversion Factor = 2.52337742 R/hr per Ci/m2
Composite ECF per FGR table = 3.11863852 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.17850351 Rem/hr per Ci/m2

Actinide Source

Point in time = 3.91466618 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	9.1752E+21	8.4476E+05	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	6.3206E+21	2.0303E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	6.7008E+17	3220.	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	8.0539E+18	2972.	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	8.2233E+17	42.45	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	8.2514E+06	0.9443	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.7642E+09	0.9443	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.9154E+12	0.9443	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	9.2452E+13	0.9443	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	9.0491E+16	0.9433	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	1.9665E+22	0.4842	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.0150E+13	0.4822	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3825E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	5.7731E+14	0.1178	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.0758E+20	7.3047E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-228	1.9130	y	0.03	4.6550E+15	1.4445E-03	0.0031	0.0000	0.0000	5.4060
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-237	0.21400E+07	y	0.47	3.1274E+21	8.6754E-04	0.0320	0.0000	0.0000	4.7900
Ra-224	3.6400	d	0.82	7.1600E+12	4.2650E-04	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.2698E+09	4.2632E-04	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	3.4136E+06	4.2632E-04	0.0000	0.0000	0.0000	6.7780
Pb-210	22.160	y	0.54	1.2513E+16	3.3520E-04	0.0045	0.0061	0.0000	0.0000
Pb-212	10.640	h	0.09	6.4975E+11	3.1778E-04	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	5.9647E+10	3.0762E-04	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	3.135	1.9706E-04	0.0000	0.0000	0.0000	8.7850
Th-234	24.090	d	0.12	1.5609E+13	1.4049E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	5.2631E+08	1.4045E-04	0.0160	0.8101	0.0000	0.0000
Tl-208	3.0530	m	0.13	1.0788E+09	1.1033E-04	3.3800	0.5598	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.7880E+12	7.7350E-05	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	5.5958E+12	4.4938E-05	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	7.4769E+17	1.3545E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	3.3615E+11	5.2664E-07	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	2.4720E+08	1.8970E-07	1.9000	0.2120	0.0000	0.0000
Np-238	2.1170	d	0.09	4.3770E+08	4.4830E-08	0.6470	0.2105	0.0000	0.0000
Th-230	75392.	y	0.40	9.7753E+14	7.6973E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	6.6642E+13	5.3905E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	9.3766E+10	2.5569E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	3.1759E+07	4.6528E-10	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	1.0657E+07	1.2343E-10	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	1.8424E+06	3.9948E-11	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	624.7	3.9803E-11	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	6.8627E-02	3.9803E-11	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	5618.	3.8484E-11	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	8.4427E-06	3.7658E-11	0.0000	0.0000	0.0000	8.3760
Fr-223	21.800	m	1.84	2439.	3.4930E-11	0.0634	0.3427	0.0000	0.0000
Pb-209	3.2530	h	0.43	2.0858E+04	3.3366E-11	0.0001	0.1975	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 83
Total activity (Ci) = 1.05404E+06

Total number of decays = 5.32489E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 2.94653E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.17085
Average beta E (MeV) = 0.10070
Average alpha E (MeV) = 3.55425E-05

Composite Exposure Rate Conversion Factor = 2.45257235 R/hr per Ci/m2
Composite ECF per FGR table = 3.04743314 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.13562512 Rem/hr per Ci/m2

Actinide Source

Point in time = 4.88902712 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	6.8876E+21	6.3414E+05	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	5.7188E+21	1.8370E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	2.1226E+17	1020.	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	2.5513E+18	941.6	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	7.0018E+17	36.15	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	7.9878E+06	0.9141	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.7078E+09	0.9141	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.8542E+12	0.9141	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	8.9498E+13	0.9141	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	8.7600E+16	0.9132	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	2.1952E+22	0.5405	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.4874E+13	0.5389	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3824E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.0024E+14	0.1224	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1354E+20	7.3586E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-228	1.9130	y	0.03	5.8107E+15	1.8032E-03	0.0031	0.0000	0.0000	5.4060
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-237	0.21400E+07	y	0.47	3.7292E+21	1.0345E-03	0.0320	0.0000	0.0000	4.7900
Ra-224	3.6400	d	0.82	1.0580E+13	6.3021E-04	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.8765E+09	6.3000E-04	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	5.0444E+06	6.3000E-04	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	1.0223E+12	4.9999E-04	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	9.4578E+10	4.8778E-04	0.1040	0.3164	0.0000	2.1750
Pb-210	22.160	y	0.54	1.5406E+16	4.1270E-04	0.0045	0.0061	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	4.971	3.1247E-04	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.7113E+09	1.7502E-04	3.3800	0.5598	0.0000	0.0000
Th-234	24.090	d	0.12	1.9229E+13	1.7307E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	6.4840E+08	1.7303E-04	0.0160	0.8101	0.0000	0.0000
Bi-210	5.0120	d	0.10	2.6554E+12	1.1488E-04	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	8.3884E+12	6.7364E-05	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	8.7022E+17	1.5764E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	6.3182E+11	9.8984E-07	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	3.1163E+08	2.3915E-07	1.9000	0.2120	0.0000	0.0000
Np-238	2.1170	d	0.09	3.1815E+08	3.2585E-08	0.6470	0.2105	0.0000	0.0000
Th-230	75392.	y	0.40	1.2208E+15	9.6131E-09	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	8.3229E+13	6.7322E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	1.3949E+11	3.8038E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	4.8814E+07	7.1514E-10	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	1.9838E+07	2.2978E-10	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	3.4915E+06	7.5705E-11	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	1185.	7.5488E-11	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	0.1302	7.5488E-11	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	1.0729E+04	7.3492E-11	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	1.6123E-05	7.1914E-11	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	4.1008E+04	6.5600E-11	0.0001	0.1975	0.0000	0.0000
Fr-223	21.800	m	1.84	3636.	5.2080E-11	0.0634	0.3427	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 8.19846E+05

Total number of decays = 5.61499E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.10706E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.16835
Average beta E (MeV) = 9.91259E-02
Average alpha E (MeV) = 4.48233E-05

Composite Exposure Rate Conversion Factor = 2.40294480 R/hr per Ci/m2
Composite ECF per FGR table = 2.99638128 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.10431409 Rem/hr per Ci/m2

Actinide Source

Point in time = 6.10591888 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	4.8141E+21	4.4324E+05	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	5.0470E+21	1.6212E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	5.0506E+16	242.7	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	6.0706E+17	224.0	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	5.7278E+17	29.57	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	7.6703E+06	0.8778	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.6400E+09	0.8778	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.7805E+12	0.8778	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	8.5942E+13	0.8778	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	8.4118E+16	0.8769	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	2.4026E+22	0.5916	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	4.9155E+13	0.5903	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3823E+19	0.3727	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.1438E+14	0.1253	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1564E+20	7.3776E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-228	1.9130	y	0.03	7.2525E+15	2.2506E-03	0.0031	0.0000	0.0000	5.4060
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Np-237	0.21400E+07	y	0.47	4.4010E+21	1.2208E-03	0.0320	0.0000	0.0000	4.7900
Ra-224	3.6400	d	0.82	1.5460E+13	9.2089E-04	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	2.7422E+09	9.2065E-04	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	7.3716E+06	9.2065E-04	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	1.5721E+12	7.6887E-04	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.4631E+11	7.5457E-04	0.1040	0.3164	0.0000	2.1750
Pb-210	22.160	y	0.54	1.8889E+16	5.0601E-04	0.0045	0.0061	0.0000	0.0000
Po-212	0.29800E-06	s	1.01	7.689	4.8338E-04	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	2.6482E+09	2.7083E-04	3.3800	0.5598	0.0000	0.0000
Th-234	24.090	d	0.12	2.3609E+13	2.1250E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	7.9613E+08	2.1246E-04	0.0160	0.8101	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.8946E+12	1.6849E-04	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	1.2459E+13	1.0005E-04	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	9.9810E+17	1.8081E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	1.1754E+12	1.8415E-06	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	3.8961E+08	2.9899E-07	1.9000	0.2120	0.0000	0.0000
Np-238	2.1170	d	0.09	2.1360E+08	2.1877E-08	0.6470	0.2105	0.0000	0.0000
Th-230	75392.	y	0.40	1.5247E+15	1.2006E-08	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	1.0394E+14	8.4079E-09	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	2.0546E+11	5.6025E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	7.4765E+07	1.0953E-09	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	3.6556E+07	4.2341E-10	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	6.5732E+06	1.4252E-10	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	2232.	1.4220E-10	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	0.2452	1.4220E-10	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	2.0322E+04	1.3921E-10	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	3.0540E-05	1.3622E-10	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	7.9523E+04	1.2721E-10	0.0001	0.1975	0.0000	0.0000
Fr-223	21.800	m	1.84	5365.	7.6841E-11	0.0634	0.3427	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 6.05861E+05

Total number of decays = 5.88993E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.25920E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.16631
Average beta E (MeV) = 9.72331E-02
Average alpha E (MeV) = 5.90913E-05

Composite Exposure Rate Conversion Factor = 2.36523128 R/hr per Ci/m2
Composite ECF per FGR table = 2.95610619 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.07889318 Rem/hr per Ci/m2

Actinide Source

Point in time = 7.62569809 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	3.0779E+21	2.8338E+05	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	4.3177E+21	1.3870E+05	0.1440	0.0678	0.0000	0.0000
Np-240	1.0830	h	4.62	8.4067E+15	40.39	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	1.0104E+17	37.29	0.0073	0.1070	0.0000	0.0000
U-231	4.2000	d	2.38	4.4572E+17	23.01	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	7.2915E+06	0.8344	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.5590E+09	0.8344	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.6926E+12	0.8344	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	8.1697E+13	0.8344	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	7.9964E+16	0.8336	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	2.5762E+22	0.6343	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.2740E+13	0.6333	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3821E+19	0.3726	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2173E+14	0.1268	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1619E+20	7.3826E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-228	1.9130	y	0.03	9.0507E+15	2.8086E-03	0.0031	0.0000	0.0000	5.4060
Np-237	0.21400E+07	y	0.47	5.1303E+21	1.4231E-03	0.0320	0.0000	0.0000	4.7900
Ra-224	3.6400	d	0.82	2.2303E+13	1.3285E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	3.9564E+09	1.3283E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1.0635E+07	1.3283E-03	0.0000	0.0000	0.0000	6.7780
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pb-212	10.640	h	0.09	2.3628E+12	1.1556E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	2.2090E+11	1.1393E-03	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	11.61	7.2982E-04	0.0000	0.0000	0.0000	8.7850
Pb-210	22.160	y	0.54	2.3045E+16	6.1734E-04	0.0045	0.0061	0.0000	0.0000
Tl-208	3.0530	m	0.13	3.9992E+09	4.0900E-04	3.3800	0.5598	0.0000	0.0000
Th-234	24.090	d	0.12	2.8868E+13	2.5983E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	9.7353E+08	2.5980E-04	0.0160	0.8101	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.6281E+12	2.4348E-04	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	1.8297E+13	1.4693E-04	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	1.1258E+18	2.0394E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	2.1606E+12	3.3849E-06	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	4.8324E+08	3.7084E-07	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	1.9042E+15	1.4994E-08	0.0004	0.0000	0.0000	4.6640
Np-238	2.1170	d	0.09	1.2986E+08	1.3301E-08	0.6470	0.2105	0.0000	0.0000
Th-229	7339.2	y	2.18	1.2982E+14	1.0501E-08	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	2.9912E+11	8.1566E-09	0.0002	0.0097	0.0000	0.0702
Ra-225	14.800	d	1.35	1.1402E+08	1.6705E-09	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	6.6545E+07	7.7076E-10	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	1.2275E+07	2.6615E-10	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	4169.	2.6567E-10	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	0.4581	2.6567E-10	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	3.8137E+04	2.6124E-10	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	5.7311E-05	2.5563E-10	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.5208E+05	2.4328E-10	0.0001	0.1975	0.0000	0.0000
Fr-223	21.800	m	1.84	7822.	1.1203E-10	0.0634	0.3427	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 82
Total activity (Ci) = 4.22182E+05

Total number of decays = 6.13661E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.39569E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.16422
Average beta E (MeV) = 9.47355E-02
Average alpha E (MeV) = 8.19063E-05

Composite Exposure Rate Conversion Factor = 2.32875013 R/hr per Ci/m2
Composite ECF per FGR table = 2.91572762 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.05274224 Rem/hr per Ci/m2

Actinide Source

Point in time = 9.52373600 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Np-239	2.3550	d	0.17	1.7605E+21	1.6209E+05	0.1740	0.1079	0.0000	0.0000
U-237	6.7500	d	0.15	3.5531E+21	1.1413E+05	0.1440	0.0678	0.0000	0.0000
U-231	4.2000	d	2.38	3.2585E+17	16.82	0.0824	0.0000	0.0000	0.0002
Np-240	1.0830	h	4.62	8.9554E+14	4.303	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	1.0764E+16	3.973	0.0073	0.1070	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	6.8446E+06	0.7833	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.4634E+09	0.7833	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.5889E+12	0.7833	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	7.6690E+13	0.7833	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	7.5063E+16	0.7825	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	2.7080E+22	0.6668	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.5461E+13	0.6660	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3819E+19	0.3726	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2481E+14	0.1274	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Th-228	1.9130	y	0.03	1.1293E+16	3.5042E-03	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	3.1718E+13	1.8893E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	5.6267E+09	1.8891E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	1.5126E+07	1.8891E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	3.4710E+12	1.6976E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	3.2565E+11	1.6795E-03	0.1040	0.3164	0.0000	2.1750
Np-237	0.21400E+07	y	0.47	5.8949E+21	1.6352E-03	0.0320	0.0000	0.0000	4.7900
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Po-212	0.29800E-06	s	1.01	17.11	1.0759E-03	0.0000	0.0000	0.0000	8.7850
Pb-210	22.160	y	0.54	2.7947E+16	7.4866E-04	0.0045	0.0061	0.0000	0.0000
Tl-208	3.0530	m	0.13	5.8967E+09	6.0305E-04	3.3800	0.5598	0.0000	0.0000
Bi-210	5.0120	d	0.10	7.9927E+12	3.4577E-04	0.0004	0.3890	0.0000	4.6480
Th-234	24.090	d	0.12	3.5122E+13	3.1612E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.1845E+09	3.1609E-04	0.0160	0.8101	0.0000	0.0000
Pa-233	27.000	d	0.37	2.6508E+13	2.1288E-04	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	1.2464E+18	2.2579E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	3.9161E+12	6.1351E-06	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	5.9457E+08	4.5628E-07	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	2.3782E+15	1.8726E-08	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	1.6213E+14	1.3114E-08	0.0340	0.0000	0.0000	4.9210
Ac-227	21.770	y	0.01	4.2977E+11	1.1719E-08	0.0002	0.0097	0.0000	0.0702
Np-238	2.1170	d	0.09	6.9757E+07	7.1446E-09	0.6470	0.2105	0.0000	0.0000
Ra-225	14.800	d	1.35	1.7299E+08	2.5343E-09	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	1.1940E+08	1.3830E-09	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	2.2695E+07	4.9208E-10	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	7712.	4.9139E-10	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	0.8472	4.9139E-10	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	7.0790E+04	4.8492E-10	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	1.0638E-04	4.7451E-10	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	2.8659E+05	4.5846E-10	0.0001	0.1975	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	2.1211E-02	2.2324E-10	0.0000	0.0000	0.0000	7.3920

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 2.76253E+05

Total number of decays = 6.34484E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.51092E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.16161
Average beta E (MeV) = 9.13265E-02
Average alpha E (MeV) = 1.19631E-04

Composite Exposure Rate Conversion Factor = 2.28447771 R/hr per Ci/m2
Composite ECF per FGR table = 2.86592007 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 2.02012110 Rem/hr per Ci/m2

Actinide Source

Point in time = 11.8942184 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	2.7854E+21	8.9474E+04	0.1440	0.0678	0.0000	0.0000
Np-239	2.3550	d	0.17	8.7624E+20	8.0675E+04	0.1740	0.1079	0.0000	0.0000
U-231	4.2000	d	2.38	2.2035E+17	11.38	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	6.3247E+06	0.7238	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.3523E+09	0.7238	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.4682E+12	0.7238	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	7.0865E+13	0.7238	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	6.9361E+16	0.7230	0.0029	0.0000	0.0000	5.8680
Pu-239	24111.	y	0.05	2.7964E+22	0.6885	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.7287E+13	0.6879	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3816E+19	0.3726	0.0002	0.0000	0.0000	5.3030
Np-240	1.0830	h	4.62	5.4635E+13	0.2625	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	6.5668E+14	0.2424	0.0073	0.1070	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2580E+14	0.1276	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1630E+20	7.3836E-02	0.0000	0.0000	0.0000	5.1550
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
Th-228	1.9130	y	0.03	1.4086E+16	4.3712E-03	0.0031	0.0000	0.0000	5.4060
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Ra-224	3.6400	d	0.82	4.4409E+13	2.6453E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	7.8784E+09	2.6450E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.1178E+07	2.6450E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	4.9850E+12	2.4381E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	4.6894E+11	2.4185E-03	0.1040	0.3164	0.0000	2.1750
Np-237	0.21400E+07	y	0.47	6.6626E+21	1.8482E-03	0.0320	0.0000	0.0000	4.7900
Po-212	0.29800E-06	s	1.01	24.64	1.5493E-03	0.0000	0.0000	0.0000	8.7850
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pb-210	22.160	y	0.54	3.3648E+16	9.0138E-04	0.0045	0.0061	0.0000	0.0000
Tl-208	3.0530	m	0.13	8.4924E+09	8.6851E-04	3.3800	0.5598	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.1123E+13	4.8117E-04	0.0004	0.3890	0.0000	4.6480
Th-234	24.090	d	0.12	4.2467E+13	3.8223E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.4322E+09	3.8220E-04	0.0160	0.8101	0.0000	0.0000
Pa-233	27.000	d	0.37	3.7788E+13	3.0346E-04	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	1.3529E+18	2.4508E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	6.9821E+12	1.0938E-05	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	7.2533E+08	5.5663E-07	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	2.9701E+15	2.3387E-08	0.0004	0.0000	0.0000	4.6640
Ac-227	21.770	y	0.01	6.0855E+11	1.6594E-08	0.0002	0.0097	0.0000	0.0702
Th-229	7339.2	y	2.18	2.0248E+14	1.6378E-08	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	2.6079E+08	3.8207E-09	0.0137	0.0970	0.0000	0.0000
Np-238	2.1170	d	0.09	3.2101E+07	3.2878E-09	0.6470	0.2105	0.0000	0.0000
Th-227	18.720	d	0.03	2.1068E+08	2.4402E-09	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	4.1456E+07	8.9888E-10	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	1.4091E+04	8.9789E-10	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	1.548	8.9789E-10	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	1.2972E+05	8.8859E-10	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	1.9494E-04	8.6951E-10	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	5.3158E+05	8.5037E-10	0.0001	0.1975	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	4.4985E-02	4.7345E-10	0.0000	0.0000	0.0000	7.3920

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 1.70168E+05

Total number of decays = 6.51005E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.60234E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.15822
Average beta E (MeV) = 8.68048E-02
Average alpha E (MeV) = 1.83288E-04

Composite Exposure Rate Conversion Factor = 2.22726917 R/hr per Ci/m2
Composite ECF per FGR table = 2.80130863 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.97769308 Rem/hr per Ci/m2

Actinide Source

Point in time = 14.8547211 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	2.0552E+21	6.6019E+04	0.1440	0.0678	0.0000	0.0000
Np-239	2.3550	d	0.17	3.6660E+20	3.3753E+04	0.1740	0.1079	0.0000	0.0000
U-231	4.2000	d	2.38	1.3519E+17	6.979	0.0824	0.0000	0.0000	0.0002
Pu-239	24111.	y	0.05	2.8473E+22	0.7011	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.8339E+13	0.7006	0.0000	0.0000	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	5.7306E+06	0.6558	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.2252E+09	0.6558	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.3302E+12	0.6558	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	6.4207E+13	0.6558	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	6.2845E+16	0.6551	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3812E+19	0.3726	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2603E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1630E+20	7.3836E-02	0.0000	0.0000	0.0000	5.1550
Np-240	1.0830	h	4.62	1.6616E+12	7.9841E-03	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	1.9972E+13	7.3709E-03	0.0073	0.1070	0.0000	0.0000
Th-228	1.9130	y	0.03	1.7566E+16	5.4510E-03	0.0031	0.0000	0.0000	5.4060
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Ra-224	3.6400	d	0.82	6.1167E+13	3.6436E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.0852E+10	3.6432E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.9171E+07	3.6432E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	7.0028E+12	3.4249E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	6.6007E+11	3.4042E-03	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	34.69	2.1807E-03	0.0000	0.0000	0.0000	8.7850
Np-237	0.21400E+07	y	0.47	7.3928E+21	2.0507E-03	0.0320	0.0000	0.0000	4.7900
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Tl-208	3.0530	m	0.13	1.1955E+10	1.2226E-03	3.3800	0.5598	0.0000	0.0000
Pb-210	22.160	y	0.54	4.0162E+16	1.0759E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	1.5121E+13	6.5414E-04	0.0004	0.3890	0.0000	4.6480
Th-234	24.090	d	0.12	5.0965E+13	4.5871E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	1.7188E+09	4.5869E-04	0.0160	0.8101	0.0000	0.0000
Pa-233	27.000	d	0.37	5.2847E+13	4.2439E-04	0.2175	0.0664	0.0000	0.0000
Pa-231	32771.	y	0.34	1.4393E+18	2.6072E-05	0.0394	0.0000	0.0000	4.9240
Po-210	138.40	d	0.00	1.2214E+13	1.9135E-05	0.0000	0.0000	0.0000	5.3040
Pa-234	6.7810	h	0.44	8.7660E+08	6.7272E-07	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	3.7094E+15	2.9208E-08	0.0004	0.0000	0.0000	4.6640
Ac-227	21.770	y	0.01	8.4830E+11	2.3132E-08	0.0002	0.0097	0.0000	0.0702
Th-229	7339.2	y	2.18	2.5288E+14	2.0455E-08	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	3.9020E+08	5.7165E-09	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	3.6463E+08	4.2233E-09	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	7.4629E+07	1.6181E-09	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	2.5373E+04	1.6167E-09	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	2.788	1.6167E-09	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	2.3411E+05	1.6036E-09	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	3.5181E-04	1.5692E-09	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	9.6870E+05	1.5496E-09	0.0001	0.1975	0.0000	0.0000
Np-238	2.1170	d	0.09	1.2177E+07	1.2472E-09	0.6470	0.2105	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	9.3652E-02	9.8564E-10	0.0000	0.0000	0.0000	7.3920

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 99785.

Total number of decays = 6.63405E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.67095E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.15414
Average beta E (MeV) = 8.13558E-02
Average alpha E (MeV) = 2.90693E-04

Composite Exposure Rate Conversion Factor = 2.15857935 R/hr per Ci/m2
Composite ECF per FGR table = 2.72368407 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.92670012 Rem/hr per Ci/m2

Actinide Source

Point in time = 18.5520649 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	1.4060E+21	4.5163E+04	0.1440	0.0678	0.0000	0.0000
Np-239	2.3550	d	0.17	1.2347E+20	1.1368E+04	0.1740	0.1079	0.0000	0.0000
U-231	4.2000	d	2.38	7.3439E+16	3.791	0.0824	0.0000	0.0000	0.0002
Pu-239	24111.	y	0.05	2.8716E+22	0.7071	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.8841E+13	0.7066	0.0000	0.0000	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	5.0662E+06	0.5798	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.0832E+09	0.5798	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.1760E+12	0.5798	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	5.6764E+13	0.5798	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	5.5560E+16	0.5792	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3808E+19	0.3725	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2606E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1630E+20	7.3835E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	2.1897E+16	6.7949E-03	0.0031	0.0000	0.0000	5.4060
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
Ra-224	3.6400	d	0.82	8.2872E+13	4.9365E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.4703E+10	4.9361E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	3.9523E+07	4.9361E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	9.6316E+12	4.7106E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	9.0922E+11	4.6892E-03	0.1040	0.3164	0.0000	2.1750
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Po-212	0.29800E-06	s	1.01	47.78	3.0039E-03	0.0000	0.0000	0.0000	8.7850
Np-237	0.21400E+07	y	0.47	8.0420E+21	2.2309E-03	0.0320	0.0000	0.0000	4.7900
Tl-208	3.0530	m	0.13	1.6469E+10	1.6843E-03	3.3800	0.5598	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pb-210	22.160	y	0.54	4.7441E+16	1.2709E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	2.0020E+13	8.6610E-04	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	7.2281E+13	5.8046E-04	0.2175	0.0664	0.0000	0.0000
Th-234	24.090	d	0.12	6.0609E+13	5.4552E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.0441E+09	5.4550E-04	0.0160	0.8101	0.0000	0.0000
Np-240	1.0830	h	4.62	2.1186E+10	1.0180E-04	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	2.5464E+11	9.3979E-05	0.0073	0.1070	0.0000	0.0000
Po-210	138.40	d	0.00	2.0904E+13	3.2749E-05	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.5025E+18	2.7218E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	1.0483E+09	8.0448E-07	1.9000	0.2120	0.0000	0.0000
Th-230	75392.	y	0.40	4.6326E+15	3.6478E-08	0.0004	0.0000	0.0000	4.6640
Ac-227	21.770	y	0.01	1.1636E+12	3.1729E-08	0.0002	0.0097	0.0000	0.0702
Th-229	7339.2	y	2.18	3.1582E+14	2.5546E-08	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	5.7858E+08	8.4764E-09	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	6.1754E+08	7.1527E-09	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	1.3201E+08	2.8624E-09	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	4.4891E+04	2.8605E-09	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	4.932	2.8605E-09	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	4.1494E+05	2.8424E-09	0.0831	0.4240	0.0000	0.1222
Po-213	0.42000E-05	s	19.05	6.2357E-04	2.7814E-09	0.0000	0.0000	0.0000	8.3760
Pb-209	3.2530	h	0.43	1.7303E+06	2.7680E-09	0.0001	0.1975	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	0.1905	2.0047E-09	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	1.0568E+08	2.0047E-09	0.1351	0.0000	0.0000	5.6640

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 56540.

Total number of decays = 6.72330E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.72034E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.15002
Average beta E (MeV) = 7.58523E-02
Average alpha E (MeV) = 4.69239E-04

Composite Exposure Rate Conversion Factor = 2.08921480 R/hr per Ci/m2
Composite ECF per FGR table = 2.64528441 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.87519419 Rem/hr per Ci/m2

Actinide Source

Point in time = 23.1697197 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	8.7506E+20	2.8109E+04	0.1440	0.0678	0.0000	0.0000
Np-239	2.3550	d	0.17	3.1719E+19	2920.	0.1740	0.1079	0.0000	0.0000
U-231	4.2000	d	2.38	3.4274E+16	1.769	0.0824	0.0000	0.0000	0.0002
Pu-239	24111.	y	0.05	2.8808E+22	0.7093	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9030E+13	0.7089	0.0000	0.0000	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	4.3437E+06	0.4971	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	9.2870E+08	0.4971	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.0083E+12	0.4971	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	4.8668E+13	0.4971	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	4.7636E+16	0.4966	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3802E+19	0.3725	0.0002	0.0000	0.0000	5.3030
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	2.7283E+16	8.4663E-03	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	1.1052E+14	6.5835E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.9609E+10	6.5832E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	5.2711E+07	6.5832E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	1.2992E+13	6.3541E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.2278E+12	6.3324E-03	0.1040	0.3164	0.0000	2.1750
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Po-212	0.29800E-06	s	1.01	64.53	4.0565E-03	0.0000	0.0000	0.0000	8.7850
Np-237	0.21400E+07	y	0.47	8.5729E+21	2.3781E-03	0.0320	0.0000	0.0000	4.7900
Tl-208	3.0530	m	0.13	2.2241E+10	2.2746E-03	3.3800	0.5598	0.0000	0.0000
Pb-210	22.160	y	0.54	5.5353E+16	1.4828E-03	0.0045	0.0061	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Bi-210	5.0120	d	0.10	2.5744E+13	1.1137E-03	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	9.6381E+13	7.7400E-04	0.2175	0.0664	0.0000	0.0000
Th-234	24.090	d	0.12	7.1299E+13	6.4174E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.4047E+09	6.4172E-04	0.0160	0.8101	0.0000	0.0000
Po-210	138.40	d	0.00	3.4906E+13	5.4685E-05	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.5436E+18	2.7962E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	1.2386E+09	9.5052E-07	1.9000	0.2120	0.0000	0.0000
Np-240	1.0830	h	4.62	9.1201E+07	4.3822E-07	1.1900	0.2828	0.0000	0.0000
U-240	14.100	h	1.42	1.0962E+09	4.0456E-07	0.0073	0.1070	0.0000	0.0000
Th-230	75392.	y	0.40	5.7857E+15	4.5558E-08	0.0004	0.0000	0.0000	4.6640
Ac-227	21.770	y	0.01	1.5710E+12	4.2838E-08	0.0002	0.0097	0.0000	0.0702
Th-229	7339.2	y	2.18	3.9443E+14	3.1905E-08	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	8.4890E+08	1.2437E-08	0.0137	0.0970	0.0000	0.0000
Th-227	18.720	d	0.03	1.0212E+09	1.1828E-08	0.1595	0.0000	0.0000	5.8900
Ac-225	10.000	d	1.00	2.2873E+08	4.9595E-09	0.0176	0.0000	0.0000	5.7880
Fr-221	4.9000	m	4.08	7.7793E+04	4.9570E-09	0.0287	0.0000	0.0000	6.3590
At-217	0.32300E-01	s	1.24	8.547	4.9570E-09	0.0002	0.0000	0.0000	7.0630
Bi-213	45.580	m	0.13	7.2010E+05	4.9328E-09	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	3.0214E+06	4.8333E-09	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	1.0821E-03	4.8268E-09	0.0000	0.0000	0.0000	8.3760
Po-215	0.17800E-02	s	0.56	0.3766	3.9640E-09	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	2.0896E+08	3.9640E-09	0.1351	0.0000	0.0000	5.6640

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 31036.

Total number of decays = 6.78558E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.75480E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14680
Average beta E (MeV) = 7.15595E-02
Average alpha E (MeV) = 7.67615E-04

Composite Exposure Rate Conversion Factor = 2.03508997 R/hr per Ci/m2
Composite ECF per FGR table = 2.58408618 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.83498430 Rem/hr per Ci/m2

Actinide Source

Point in time = 28.9367237 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	4.8400E+20	1.5547E+04	0.1440	0.0678	0.0000	0.0000
Np-239	2.3550	d	0.17	5.8096E+18	534.9	0.1740	0.1079	0.0000	0.0000
Pu-239	24111.	y	0.05	2.8834E+22	0.7100	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9084E+13	0.7095	0.0000	0.0000	0.0000	0.0000
U-231	4.2000	d	2.38	1.3232E+16	0.6831	0.0824	0.0000	0.0000	0.0002
Po-214	0.16370E-03	s	0.12	3.5842E+06	0.4102	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	7.6632E+08	0.4102	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	8.3201E+11	0.4102	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	4.0159E+13	0.4102	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	3.9307E+16	0.4097	0.0029	0.0000	0.0000	5.8680
U-232	69.811	y	0.72	4.3796E+19	0.3724	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	3.3974E+16	1.0543E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	1.4530E+14	8.6553E-03	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	2.5780E+10	8.6549E-03	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	6.9300E+07	8.6549E-03	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	1.7226E+13	8.4250E-03	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.6294E+12	8.4032E-03	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	85.63	5.3831E-03	0.0000	0.0000	0.0000	8.7850
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Tl-208	3.0530	m	0.13	2.9516E+10	3.0186E-03	3.3800	0.5598	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	8.9640E+21	2.4866E-03	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	6.3661E+16	1.7054E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	3.2078E+13	1.3877E-03	0.0004	0.3890	0.0000	4.6480
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Pa-233	27.000	d	0.37	1.2491E+14	1.0031E-03	0.2175	0.0664	0.0000	0.0000
Th-234	24.090	d	0.12	8.2802E+13	7.4527E-04	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	2.7926E+09	7.4525E-04	0.0160	0.8101	0.0000	0.0000
Po-210	138.40	d	0.00	5.6715E+13	8.8853E-05	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.5670E+18	2.8386E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	1.4434E+09	1.1077E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	2.0900E+12	5.6991E-08	0.0002	0.0097	0.0000	0.0702
Th-230	75392.	y	0.40	7.2258E+15	5.6897E-08	0.0004	0.0000	0.0000	4.6640
Th-229	7339.2	y	2.18	4.9261E+14	3.9846E-08	0.0340	0.0000	0.0000	4.9210
Th-227	18.720	d	0.03	1.6459E+09	1.9063E-08	0.1595	0.0000	0.0000	5.8900
Ra-225	14.800	d	1.35	1.2305E+09	1.8027E-08	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	3.8686E+08	8.3881E-09	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	14.46	8.3848E-09	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	1.3159E+05	8.3848E-09	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	1.2194E+06	8.3533E-09	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	5.1415E+06	8.2249E-09	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	1.8325E-03	8.1739E-09	0.0000	0.0000	0.0000	8.3760
Po-215	0.17800E-02	s	0.56	0.7206	7.5840E-09	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	3.9979E+08	7.5840E-09	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	1603.	7.5840E-09	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	8.7376E+05	7.5572E-09	0.0637	0.4455	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 82
Total activity (Ci) = 16087.

Total number of decays = 6.82729E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.77788E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14496
Average beta E (MeV) = 6.91132E-02
Average alpha E (MeV) = 1.30417E-03

Composite Exposure Rate Conversion Factor = 2.00419664 R/hr per Ci/m2
Composite ECF per FGR table = 2.54909873 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.81198585 Rem/hr per Ci/m2

Actinide Source

Point in time = 36.1390800 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	2.3102E+20	7421.	0.1440	0.0678	0.0000
Np-239	2.3550	d	0.17	6.9743E+17	64.21	0.1740	0.1079	0.0000
Pu-239	24111.	y	0.05	2.8839E+22	0.7101	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	5.9094E+13	0.7097	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3787E+19	0.3723	0.0002	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2.8194E+06	0.3227	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	6.0280E+08	0.3227	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	6.5447E+11	0.3227	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	3.1590E+13	0.3226	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	3.0919E+16	0.3223	0.0029	0.0000	0.0000
U-231	4.2000	d	2.38	4.0309E+15	0.2081	0.0824	0.0000	0.0002
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	4.2276E+16	1.3119E-02	0.0031	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.8868E+14	1.1239E-02	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	3.3476E+10	1.1239E-02	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	8.9990E+07	1.1239E-02	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	2.2512E+13	1.1010E-02	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	2.1306E+12	1.0988E-02	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	112.0	7.0391E-03	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Tl-208	3.0530	m	0.13	3.8597E+10	3.9473E-03	3.3800	0.5598	0.0000
Np-237	0.21400E+07	y	0.47	9.2170E+21	2.5568E-03	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	7.2015E+16	1.9292E-03	0.0045	0.0061	0.0000
Bi-210	5.0120	d	0.10	3.8671E+13	1.6729E-03	0.0004	0.3890	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Pa-233	27.000	d	0.37	1.5695E+14	1.2604E-03	0.2175	0.0664	0.0000
Th-234	24.090	d	0.12	9.4730E+13	8.5263E-04	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.1950E+09	8.5262E-04	0.0160	0.8101	0.0000
Po-210	138.40	d	0.00	8.9447E+13	1.4013E-04	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	1.5791E+18	2.8606E-05	0.0394	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.6557E+09	1.2706E-06	1.9000	0.2120	0.0000
Ac-227	21.770	y	0.01	2.7450E+12	7.4851E-08	0.0002	0.0097	0.0000
Th-230	75392.	y	0.40	9.0243E+15	7.1059E-08	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	6.1521E+14	4.9763E-08	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	2.5822E+09	2.9908E-08	0.1595	0.0000	0.0000
Ra-225	14.800	d	1.35	1.7592E+09	2.5773E-08	0.0137	0.0970	0.0000
Po-215	0.17800E-02	s	0.56	1.328	1.3976E-08	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	7.3676E+08	1.3976E-08	0.1351	0.0000	0.0000
Rn-219	3.9600	s	1.26	2954.	1.3976E-08	0.0560	0.0000	0.0000
Pb-211	36.100	m	0.55	1.6116E+06	1.3939E-08	0.0637	0.4455	0.0000
Bi-211	2.1700	m	1.84	9.6862E+04	1.3937E-08	0.0474	0.0005	0.0000
Tl-207	4.7700	m	0.63	2.1226E+05	1.3894E-08	0.0029	0.4953	0.0000
Ac-225	10.000	d	1.00	6.3649E+08	1.3801E-08	0.0176	0.0000	0.0000
Fr-221	4.9000	m	4.08	2.1652E+05	1.3797E-08	0.0287	0.0000	0.0000
At-217	0.32300E-01	s	1.24	23.79	1.3797E-08	0.0002	0.0000	0.0000
Bi-213	45.580	m	0.13	2.0083E+06	1.3757E-08	0.0831	0.4240	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 7489.1

Total number of decays = 6.85311E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.79217E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14419
Average beta E (MeV) = 6.81090E-02
Average alpha E (MeV) = 2.42088E-03

Composite Exposure Rate Conversion Factor = 1.99138737 R/hr per Ci/m2
Composite ECF per FGR table = 2.53445196 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.80233133 Rem/hr per Ci/m2

Actinide Source

Point in time = 45.1341934 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	9.1725E+19	2946.	0.1440	0.0678	0.0000
Np-239	2.3550	d	0.17	4.9396E+16	4.548	0.1740	0.1079	0.0000
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	5.9096E+13	0.7097	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3776E+19	0.3723	0.0002	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	2.0892E+06	0.2391	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	4.4668E+08	0.2391	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	4.8496E+11	0.2391	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	2.3408E+13	0.2391	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	2.2911E+16	0.2388	0.0029	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000
U-231	4.2000	d	2.38	9.1345E+14	4.7157E-02	0.0824	0.0000	0.0000
Th-228	1.9130	y	0.03	5.2558E+16	1.6310E-02	0.0031	0.0000	0.0000
Ra-224	3.6400	d	0.82	2.4251E+14	1.4446E-02	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	4.3027E+10	1.4445E-02	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.1566E+08	1.4445E-02	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	2.9071E+13	1.4218E-02	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	2.7527E+12	1.4197E-02	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	144.7	9.0944E-03	0.0000	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
Tl-208	3.0530	m	0.13	4.9867E+10	5.0999E-03	3.3800	0.5598	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.3563E+21	2.5954E-03	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	7.9973E+16	2.1424E-03	0.0045	0.0061	0.0000
Bi-210	5.0120	d	0.10	4.5080E+13	1.9502E-03	0.0004	0.3890	0.0000
Pa-233	27.000	d	0.37	1.9083E+14	1.5324E-03	0.2175	0.0664	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-234	24.090	d	0.12	1.0654E+14	9.5895E-04	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.5934E+09	9.5894E-04	0.0160	0.8101	0.0000
Po-210	138.40	d	0.00	1.3666E+14	2.1410E-04	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	1.5859E+18	2.8729E-05	0.0394	0.0000	0.0000
Pa-234	6.7810	h	0.44	1.8660E+09	1.4320E-06	1.9000	0.2120	0.0000
Ac-227	21.770	y	0.01	3.5670E+12	9.7267E-08	0.0002	0.0097	0.0000
Th-230	75392.	y	0.40	1.1270E+16	8.8746E-08	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	7.6834E+14	6.2149E-08	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	3.9412E+09	4.5650E-08	0.1595	0.0000	0.0000
Ra-225	14.800	d	1.35	2.4777E+09	3.6299E-08	0.0137	0.0970	0.0000
Po-215	0.17800E-02	s	0.56	2.348	2.4714E-08	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	1.3028E+09	2.4714E-08	0.1351	0.0000	0.0000
Rn-219	3.9600	s	1.26	5224.	2.4714E-08	0.0560	0.0000	0.0000
Pb-211	36.100	m	0.55	2.8518E+06	2.4666E-08	0.0637	0.4455	0.0000
Bi-211	2.1700	m	1.84	1.7141E+05	2.4663E-08	0.0474	0.0005	0.0000
Tl-207	4.7700	m	0.63	3.7565E+05	2.4589E-08	0.0029	0.4953	0.0000
Ac-225	10.000	d	1.00	1.0155E+09	2.2019E-08	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	37.96	2.2014E-08	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	3.4548E+05	2.2014E-08	0.0287	0.0000	0.0000
Bi-213	45.580	m	0.13	3.2067E+06	2.1966E-08	0.0831	0.4240	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 2954.5

Total number of decays = 6.86711E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.79992E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14389
Average beta E (MeV) = 6.77869E-02
Average alpha E (MeV) = 5.22320E-03

Composite Exposure Rate Conversion Factor = 1.98690510 R/hr per Ci/m2
Composite ECF per FGR table = 2.52894950 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.79863131 Rem/hr per Ci/m2

Actinide Source

Point in time = 56.3682137 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	2.8939E+19	929.6	0.1440	0.0678	0.0000
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	5.9096E+13	0.7097	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3763E+19	0.3721	0.0002	0.0000	0.0000
Np-239	2.3550	d	0.17	1.8101E+15	0.1667	0.1740	0.1079	0.0000
Po-214	0.16370E-03	s	0.12	1.4368E+06	0.1644	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	3.0719E+08	0.1644	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	3.3352E+11	0.1644	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.6098E+13	0.1644	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	1.5757E+16	0.1643	0.0029	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.1629E+20	7.3835E-02	0.0000	0.0000	0.0000
Th-228	1.9130	y	0.03	6.5268E+16	2.0254E-02	0.0031	0.0000	0.0000
Ra-224	3.6400	d	0.82	3.0908E+14	1.8411E-02	0.0104	0.0000	0.0000
Rn-220	55.800	s	0.54	5.4837E+10	1.8410E-02	0.0006	0.0000	0.0000
Po-216	0.15000	s	3.33	1.4741E+08	1.8410E-02	0.0000	0.0000	0.0000
Pb-212	10.640	h	0.09	3.7184E+13	1.8186E-02	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	3.5220E+12	1.8165E-02	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	185.1	1.1636E-02	0.0000	0.0000	0.0000
U-231	4.2000	d	2.38	1.4305E+14	7.3851E-03	0.0824	0.0000	0.0000
Tl-208	3.0530	m	0.13	6.3806E+10	6.5254E-03	3.3800	0.5598	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.4191E+21	2.6128E-03	0.0320	0.0000	0.0000
Pb-210	22.160	y	0.54	8.7054E+16	2.3321E-03	0.0045	0.0061	0.0000
Bi-210	5.0120	d	0.10	5.0846E+13	2.1997E-03	0.0004	0.3890	0.0000
Pa-233	27.000	d	0.37	2.2432E+14	1.8015E-03	0.2175	0.0664	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-234	24.090	d	0.12	1.1759E+14	1.0584E-03	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	3.9659E+09	1.0584E-03	0.0160	0.8101	0.0000
Po-210	138.40	d	0.00	2.0195E+14	3.1639E-04	0.0000	0.0000	0.0000
Pa-231	32771.	y	0.34	1.5912E+18	2.8826E-05	0.0394	0.0000	0.0000
Pa-234	6.7810	h	0.44	2.0626E+09	1.5829E-06	1.9000	0.2120	0.0000
Ac-227	21.770	y	0.01	4.5966E+12	1.2534E-07	0.0002	0.0097	0.0000
Th-230	75392.	y	0.40	1.4076E+16	1.1083E-07	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	9.5958E+14	7.7619E-08	0.0340	0.0000	0.0000
Th-227	18.720	d	0.03	5.8530E+09	6.7793E-08	0.1595	0.0000	0.0000
Ra-225	14.800	d	1.35	3.4344E+09	5.0315E-08	0.0137	0.0970	0.0000
Po-215	0.17800E-02	s	0.56	3.973	4.1818E-08	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	2.2045E+09	4.1818E-08	0.1351	0.0000	0.0000
Rn-219	3.9600	s	1.26	8840.	4.1818E-08	0.0560	0.0000	0.0000
Pb-211	36.100	m	0.55	4.8280E+06	4.1757E-08	0.0637	0.4455	0.0000
Bi-211	2.1700	m	1.84	2.9019E+05	4.1754E-08	0.0474	0.0005	0.0000
Tl-207	4.7700	m	0.63	6.3602E+05	4.1632E-08	0.0029	0.4953	0.0000
Ac-225	10.000	d	1.00	1.5676E+09	3.3989E-08	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	58.59	3.3984E-08	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	5.3333E+05	3.3984E-08	0.0287	0.0000	0.0000
Bi-213	45.580	m	0.13	4.9529E+06	3.3928E-08	0.0831	0.4240	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021071D+26

Total number of nuclides = 82
Total activity (Ci) = 932.94

Total number of decays = 6.87341E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80340E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14357
Average beta E (MeV) = 6.76009E-02
Average alpha E (MeV) = 1.39951E-02

Composite Exposure Rate Conversion Factor = 1.98311853 R/hr per Ci/m2
Composite ECF per FGR table = 2.52332807 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.79465926 Rem/hr per Ci/m2

Actinide Source

Point in time = 70.3984070 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	6.8514E+18	220.1	0.1440	0.0678	0.0000	0.0000
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9096E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3746E+19	0.3720	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Po-214	0.16370E-03	s	0.12	9.0019E+05	0.1030	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.9247E+08	0.1030	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.0896E+11	0.1030	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0086E+13	0.1030	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	9.8721E+15	0.1029	0.0029	0.0000	0.0000	5.8680
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1628E+20	7.3834E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	8.0938E+16	2.5117E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	3.9115E+14	2.3300E-02	0.0104	0.0000	0.0000	5.6740
Po-216	0.15000	s	3.33	1.8656E+08	2.3299E-02	0.0000	0.0000	0.0000	6.7780
Rn-220	55.800	s	0.54	6.9399E+10	2.3299E-02	0.0006	0.0000	0.0000	6.2880
Pb-212	10.640	h	0.09	4.7187E+13	2.3078E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	4.4707E+12	2.3057E-02	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	235.0	1.4770E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	8.0993E+10	8.2831E-03	3.3800	0.5598	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Np-239	2.3550	d	0.17	2.9125E+13	2.6816E-03	0.1740	0.1079	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.4411E+21	2.6190E-03	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	9.2837E+16	2.4870E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.5580E+13	2.4045E-03	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	2.5503E+14	2.0481E-03	0.2175	0.0664	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.2720E+14	1.1449E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.2902E+09	1.1449E-03	0.0160	0.8101	0.0000	0.0000
U-231	4.2000	d	2.38	1.4122E+13	7.2906E-04	0.0824	0.0000	0.0000	0.0002
Po-210	138.40	d	0.00	2.8836E+14	4.5176E-04	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.5971E+18	2.8932E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.2338E+09	1.7142E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	5.8854E+12	1.6049E-07	0.0002	0.0097	0.0000	0.0702
Th-230	75392.	y	0.40	1.7579E+16	1.3842E-07	0.0004	0.0000	0.0000	4.6640
Th-227	18.720	d	0.03	8.4639E+09	9.8034E-08	0.1595	0.0000	0.0000	5.8900
Th-229	7339.2	y	2.18	1.1984E+15	9.6938E-08	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	4.6841E+09	6.8624E-08	0.0137	0.0970	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	6.425	6.7619E-08	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	3.5645E+09	6.7619E-08	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	1.4293E+04	6.7619E-08	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	7.8098E+06	6.7547E-08	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	4.6943E+05	6.7543E-08	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	1.0289E+06	6.7349E-08	0.0029	0.4953	0.0000	0.0000
Ac-225	10.000	d	1.00	2.3387E+09	5.0710E-08	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	87.42	5.0704E-08	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	7.9573E+05	5.0704E-08	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	7.3927E+06	5.0641E-08	0.0831	0.4240	0.0000	0.1222

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 222.99

Total number of decays = 6.87563E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80463E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.14239
Average beta E (MeV) = 6.70366E-02
Average alpha E (MeV) = 5.00237E-02

Composite Exposure Rate Conversion Factor = 1.96961415 R/hr per Ci/m2
Composite ECF per FGR table = 2.50273108 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.77993238 Rem/hr per Ci/m2

Actinide Source

Point in time = 87.9205856 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	1.1333E+18	36.40	0.1440	0.0678	0.0000	0.0000
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9096E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3725E+19	0.3718	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1628E+20	7.3834E-02	0.0000	0.0000	0.0000	5.1550
Po-214	0.16370E-03	s	0.12	5.0205E+05	5.7454E-02	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.0734E+08	5.7454E-02	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.1654E+11	5.7454E-02	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	5.6251E+12	5.7453E-02	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	5.5058E+15	5.7394E-02	0.0029	0.0000	0.0000	5.8680
Th-228	1.9130	y	0.03	1.0020E+17	3.1093E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	4.9201E+14	2.9308E-02	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	8.7295E+10	2.9308E-02	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.3466E+08	2.9308E-02	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	5.9479E+13	2.9090E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	5.6365E+12	2.9069E-02	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	296.2	1.8622E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.0211E+11	1.0443E-02	3.3800	0.5598	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Np-237	0.21400E+07	y	0.47	9.4469E+21	2.6206E-03	0.0320	0.0000	0.0000	4.7900
Pb-210	22.160	y	0.54	9.7065E+16	2.6002E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	5.9059E+13	2.5549E-03	0.0004	0.3890	0.0000	4.6480
Pa-233	27.000	d	0.37	2.8084E+14	2.2553E-03	0.2175	0.0664	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.3486E+14	1.2138E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.5483E+09	1.2138E-03	0.0160	0.8101	0.0000	0.0000
Po-210	138.40	d	0.00	3.9757E+14	6.2286E-04	0.0000	0.0000	0.0000	5.3040
U-231	4.2000	d	2.38	7.8347E+11	4.0446E-05	0.0824	0.0000	0.0000	0.0002
Pa-231	32771.	y	0.34	1.6043E+18	2.9061E-05	0.0394	0.0000	0.0000	4.9240
Np-239	2.3550	d	0.17	1.6768E+11	1.5438E-05	0.1740	0.1079	0.0000	0.0000
Pa-234	6.7810	h	0.44	2.3700E+09	1.8188E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	7.4995E+12	2.0450E-07	0.0002	0.0097	0.0000	0.0702
Th-230	75392.	y	0.40	2.1955E+16	1.7287E-07	0.0004	0.0000	0.0000	4.6640
Th-227	18.720	d	0.03	1.1936E+10	1.3825E-07	0.1595	0.0000	0.0000	5.8900
Th-229	7339.2	y	2.18	1.4967E+15	1.2107E-07	0.0340	0.0000	0.0000	4.9210
Po-215	0.17800E-02	s	0.56	9.934	1.0455E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	5.5111E+09	1.0455E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	2.2099E+04	1.0455E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	1.2078E+07	1.0447E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	7.2601E+05	1.0446E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	1.5914E+06	1.0417E-07	0.0029	0.4953	0.0000	0.0000
Ra-225	14.800	d	1.35	6.2895E+09	9.2143E-08	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	3.3751E+09	7.3181E-08	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	126.2	7.3175E-08	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	1.1484E+06	7.3175E-08	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	1.0672E+07	7.3106E-08	0.0831	0.4240	0.0000	0.1222

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 39.120

Total number of decays = 6.87622E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80496E-03
Average chain length = 11.185

Average gamma E (MeV) = 0.13573
Average beta E (MeV) = 6.38664E-02
Average alpha E (MeV) = 0.25101

Composite Exposure Rate Conversion Factor = 1.89213741 R/hr per Ci/m2
Composite ECF per FGR table = 2.38646555 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.69665861 Rem/hr per Ci/m2

Actinide Source

Point in time = 109.804245 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
U-237	6.7500	d	0.15	1.1978E+17	3.848	0.1440	0.0678	0.0000	0.0000
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9095E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3699E+19	0.3716	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1627E+20	7.3834E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	1.2377E+17	3.8407E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	6.1547E+14	3.6662E-02	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	1.0920E+11	3.6662E-02	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	2.9355E+08	3.6662E-02	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	7.4526E+13	3.6449E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	7.0635E+12	3.6429E-02	0.1040	0.3164	0.0000	2.1750
Po-214	0.16370E-03	s	0.12	2.4212E+05	2.7708E-02	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	5.1767E+07	2.7708E-02	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	5.6204E+10	2.7708E-02	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	2.7128E+12	2.7707E-02	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	2.6553E+15	2.7679E-02	0.0029	0.0000	0.0000	5.8680
Po-212	0.29800E-06	s	1.01	371.2	2.3336E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.2797E+11	1.3087E-02	3.3800	0.5598	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Pb-210	22.160	y	0.54	9.9734E+16	2.6717E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	6.1273E+13	2.6508E-03	0.0004	0.3890	0.0000	4.6480
Np-237	0.21400E+07	y	0.47	9.4479E+21	2.6208E-03	0.0320	0.0000	0.0000	4.7900
Pa-233	27.000	d	0.37	3.0040E+14	2.4124E-03	0.2175	0.0664	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.4031E+14	1.2629E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.7323E+09	1.2629E-03	0.0160	0.8101	0.0000	0.0000
Po-210	138.40	d	0.00	5.2923E+14	8.2912E-04	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.6132E+18	2.9223E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.4672E+09	1.8933E-06	1.9000	0.2120	0.0000	0.0000
U-231	4.2000	d	2.38	2.1161E+10	1.0924E-06	0.0824	0.0000	0.0000	0.0002
Ac-227	21.770	y	0.01	9.5220E+12	2.5965E-07	0.0002	0.0097	0.0000	0.0702
Th-230	75392.	y	0.40	2.7419E+16	2.1590E-07	0.0004	0.0000	0.0000	4.6640
Th-227	18.720	d	0.03	1.6454E+10	1.9058E-07	0.1595	0.0000	0.0000	5.8900
Po-215	0.17800E-02	s	0.56	14.73	1.5498E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	8.1700E+09	1.5498E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	3.2761E+04	1.5498E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	1.7909E+07	1.5490E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	1.0765E+06	1.5489E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	2.3597E+06	1.5446E-07	0.0029	0.4953	0.0000	0.0000
Th-229	7339.2	y	2.18	1.8692E+15	1.5120E-07	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	8.3253E+09	1.2197E-07	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	4.7246E+09	1.0244E-07	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	176.6	1.0243E-07	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	1.6076E+06	1.0243E-07	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	1.4943E+07	1.0236E-07	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	6.3830E+07	1.0211E-07	0.0001	0.1975	0.0000	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 6.4672

Total number of decays = 6.87634E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80502E-03
Average chain length = 11.185

Average gamma E (MeV) = 9.77334E-02
Average beta E (MeV) = 4.57372E-02
Average alpha E (MeV) = 1.4005

Composite Exposure Rate Conversion Factor = 1.44677913 R/hr per Ci/m2
Composite ECF per FGR table = 1.72443867 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 1.22166753 Rem/hr per Ci/m2

Actinide Source

Point in time = 137.134811 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9095E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3667E+19	0.3713	0.0002	0.0000	0.0000	5.3030
U-237	6.7500	d	0.15	7.2366E+15	0.2325	0.1440	0.0678	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1627E+20	7.3833E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	1.5248E+17	4.7316E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	7.6584E+14	4.5619E-02	0.0104	0.0000	0.0000	5.6740
Po-216	0.15000	s	3.33	3.6527E+08	4.5619E-02	0.0000	0.0000	0.0000	6.7780
Rn-220	55.800	s	0.54	1.3588E+11	4.5619E-02	0.0006	0.0000	0.0000	6.2880
Pb-212	10.640	h	0.09	9.2852E+13	4.5412E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	8.8014E+12	4.5392E-02	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	462.6	2.9078E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.5945E+11	1.6307E-02	3.3800	0.5598	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	9.7384E+04	1.1145E-02	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	2.0821E+07	1.1145E-02	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.2606E+10	1.1145E-02	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.0911E+12	1.1144E-02	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.0680E+15	1.1133E-02	0.0029	0.0000	0.0000	5.8680
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Pb-210	22.160	y	0.54	1.0109E+17	2.7080E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	6.2425E+13	2.7006E-03	0.0004	0.3890	0.0000	4.6480
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000	4.7900
Pa-233	27.000	d	0.37	3.1349E+14	2.5175E-03	0.2175	0.0664	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.4370E+14	1.2934E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.8466E+09	1.2934E-03	0.0160	0.8101	0.0000	0.0000
Po-210	138.40	d	0.00	6.8039E+14	1.0659E-03	0.0000	0.0000	0.0000	5.3040
Pa-231	32771.	y	0.34	1.6243E+18	2.9425E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.5275E+09	1.9396E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	1.2058E+13	3.2881E-07	0.0002	0.0097	0.0000	0.0702
Th-230	75392.	y	0.40	3.4244E+16	2.6964E-07	0.0004	0.0000	0.0000	4.6640
Th-227	18.720	d	0.03	2.2236E+10	2.5755E-07	0.1595	0.0000	0.0000	5.8900
Po-215	0.17800E-02	s	0.56	21.03	2.2137E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	1.1670E+10	2.2137E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	4.6794E+04	2.2137E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	2.5585E+07	2.2128E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	1.5379E+06	2.2128E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	3.3711E+06	2.2066E-07	0.0029	0.4953	0.0000	0.0000
Th-229	7339.2	y	2.18	2.3345E+15	1.8883E-07	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	1.0886E+10	1.5948E-07	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	6.4434E+09	1.3971E-07	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	240.9	1.3970E-07	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	2.1924E+06	1.3970E-07	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	2.0383E+07	1.3962E-07	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	8.7124E+07	1.3937E-07	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	3.0630E-02	1.3662E-07	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 82
Total activity (Ci) = 2.8320

Total number of decays = 6.87637E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80504E-03
Average chain length = 11.185

Average gamma E (MeV) = 4.39132E-02
Average beta E (MeV) = 1.98671E-02
Average alpha E (MeV) = 3.1030

Composite Exposure Rate Conversion Factor = 0.819905937 R/hr per Ci/m2
Composite ECF per FGR table = 0.789801717 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.548915327 Rem/hr per Ci/m2

Actinide Source

Point in time = 171.267685 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9095E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3626E+19	0.3710	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1626E+20	7.3832E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	1.8722E+17	5.8098E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	9.4782E+14	5.6459E-02	0.0104	0.0000	0.0000	5.6740
Po-216	0.15000	s	3.33	4.5206E+08	5.6459E-02	0.0000	0.0000	0.0000	6.7780
Rn-220	55.800	s	0.54	1.6817E+11	5.6459E-02	0.0006	0.0000	0.0000	6.2880
Pb-212	10.640	h	0.09	1.1503E+14	5.6259E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.0905E+13	5.6240E-02	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	573.1	3.6027E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	1.9756E+11	2.0204E-02	3.3800	0.5598	0.0000	0.0000
U-237	6.7500	d	0.15	2.1742E+14	6.9842E-03	0.1440	0.0678	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Po-214	0.16370E-03	s	0.12	3.1224E+04	3.5733E-03	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	6.6760E+06	3.5733E-03	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	7.2482E+09	3.5733E-03	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	3.4985E+11	3.5732E-03	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	3.4243E+14	3.5696E-03	0.0029	0.0000	0.0000	5.8680
Pb-210	22.160	y	0.54	1.0152E+17	2.7195E-03	0.0045	0.0061	0.0000	0.0000
Bi-210	5.0120	d	0.10	6.2834E+13	2.7183E-03	0.0004	0.3890	0.0000	4.6480
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000	4.7900
Pa-233	27.000	d	0.37	3.2100E+14	2.5778E-03	0.2175	0.0664	0.0000	0.0000
Po-210	138.40	d	0.00	8.4550E+14	1.3246E-03	0.0000	0.0000	0.0000	5.3040
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.4547E+14	1.3093E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.9063E+09	1.3093E-03	0.0160	0.8101	0.0000	0.0000
Pa-231	32771.	y	0.34	1.6383E+18	2.9678E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.5590E+09	1.9638E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	1.5242E+13	4.1563E-07	0.0002	0.0097	0.0000	0.0702
Th-227	18.720	d	0.03	2.9563E+10	3.4241E-07	0.1595	0.0000	0.0000	5.8900
Th-230	75392.	y	0.40	4.2767E+16	3.3676E-07	0.0004	0.0000	0.0000	4.6640
Po-215	0.17800E-02	s	0.56	29.13	3.0662E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	1.6163E+10	3.0661E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	6.4813E+04	3.0661E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	3.5440E+07	3.0652E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	2.1303E+06	3.0652E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	4.6698E+06	3.0567E-07	0.0029	0.4953	0.0000	0.0000
Th-229	7339.2	y	2.18	2.9155E+15	2.3583E-07	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	1.4091E+10	2.0644E-07	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	8.6057E+09	1.8659E-07	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	321.7	1.8659E-07	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	2.9282E+06	1.8659E-07	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	2.7226E+07	1.8650E-07	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	1.1643E+08	1.8626E-07	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	4.0915E-02	1.8250E-07	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 80
Total activity (Ci) = 2.6446

Total number of decays = 6.87640E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80506E-03
Average chain length = 11.185

Average gamma E (MeV) = 4.07467E-02
Average beta E (MeV) = 1.80363E-02
Average alpha E (MeV) = 3.3576

Composite Exposure Rate Conversion Factor = 0.799574256 R/hr per Ci/m2
Composite ECF per FGR table = 0.738696992 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.509334445 Rem/hr per Ci/m2

Actinide Source

Point in time = 213.896667 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8840E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9095E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3576E+19	0.3706	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1625E+20	7.3831E-02	0.0000	0.0000	0.0000	5.1550
Th-228	1.9130	y	0.03	2.2894E+17	7.1044E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	1.1663E+15	6.9476E-02	0.0104	0.0000	0.0000	5.6740
Po-216	0.15000	s	3.33	5.5629E+08	6.9475E-02	0.0000	0.0000	0.0000	6.7780
Rn-220	55.800	s	0.54	2.0694E+11	6.9475E-02	0.0006	0.0000	0.0000	6.2880
Pb-212	10.640	h	0.09	1.4166E+14	6.9284E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.3430E+13	6.9266E-02	0.1040	0.3164	0.0000	2.1750
Po-212	0.29800E-06	s	1.01	705.8	4.4372E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	2.4332E+11	2.4884E-02	3.3800	0.5598	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Bi-210	5.0120	d	0.10	6.2817E+13	2.7175E-03	0.0004	0.3890	0.0000	4.6480
Pb-210	22.160	y	0.54	1.0141E+17	2.7165E-03	0.0045	0.0061	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000	4.7900
Pa-233	27.000	d	0.37	3.2457E+14	2.6065E-03	0.2175	0.0664	0.0000	0.0000
Po-210	138.40	d	0.00	1.0166E+15	1.5927E-03	0.0000	0.0000	0.0000	5.3040
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.4622E+14	1.3161E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.9316E+09	1.3161E-03	0.0160	0.8101	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	7543.	8.6321E-04	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	1.6127E+06	8.6321E-04	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	1.7510E+09	8.6321E-04	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	8.4515E+10	8.6319E-04	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	8.2722E+13	8.6231E-04	0.0029	0.0000	0.0000	5.8680
U-237	6.7500	d	0.15	2.7301E+12	8.7698E-05	0.1440	0.0678	0.0000	0.0000
Pa-231	32771.	y	0.34	1.6557E+18	2.9993E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.5724E+09	1.9740E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	1.9244E+13	5.2476E-07	0.0002	0.0097	0.0000	0.0702
Th-227	18.720	d	0.03	3.8802E+10	4.4943E-07	0.1595	0.0000	0.0000	5.8900
Th-230	75392.	y	0.40	5.3412E+16	4.2058E-07	0.0004	0.0000	0.0000	4.6640
Po-215	0.17800E-02	s	0.56	39.40	4.1466E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	2.1859E+10	4.1466E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	8.7652E+04	4.1466E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	4.7932E+07	4.1457E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	2.8812E+06	4.1456E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	6.3159E+06	4.1342E-07	0.0029	0.4953	0.0000	0.0000
Th-229	7339.2	y	2.18	3.6412E+15	2.9453E-07	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	1.8097E+10	2.6513E-07	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	1.1312E+10	2.4527E-07	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	422.9	2.4526E-07	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	3.8490E+06	2.4526E-07	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	3.5790E+07	2.4517E-07	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	1.5311E+08	2.4493E-07	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	5.3785E-02	2.3990E-07	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 80
Total activity (Ci) = 2.7151

Total number of decays = 6.87644E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80508E-03
Average chain length = 11.185

Average gamma E (MeV) = 4.63855E-02
Average beta E (MeV) = 2.03600E-02
Average alpha E (MeV) = 3.3897

Composite Exposure Rate Conversion Factor = 0.890974820 R/hr per Ci/m2
Composite ECF per FGR table = 0.841011941 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.579818308 Rem/hr per Ci/m2

Actinide Source

Point in time = 267.136078 day

Top 50 most active radionuclides

Isotope	Half-life	+/-	pct	Atoms	Curies	Total Energy Output (Mev)			
						gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8839E+22	0.7101	0.0001	0.0000	0.0000	5.1000
U-235m	26.000	m	7.69	5.9095E+13	0.7097	0.0000	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3513E+19	0.3700	0.0002	0.0000	0.0000	5.3030
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000	4.1140
Th-228	1.9130	y	0.03	2.7855E+17	8.6438E-02	0.0031	0.0000	0.0000	5.4060
Ra-224	3.6400	d	0.82	1.4262E+15	8.4953E-02	0.0104	0.0000	0.0000	5.6740
Rn-220	55.800	s	0.54	2.5304E+11	8.4953E-02	0.0006	0.0000	0.0000	6.2880
Po-216	0.15000	s	3.33	6.8021E+08	8.4953E-02	0.0000	0.0000	0.0000	6.7780
Pb-212	10.640	h	0.09	1.7333E+14	8.4772E-02	0.1437	0.0998	0.0000	0.0000
Bi-212	1.0090	h	0.10	1.6434E+13	8.4755E-02	0.1040	0.3164	0.0000	2.1750
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000	4.7590
Pu-240	6563.1	y	0.08	8.1624E+20	7.3830E-02	0.0000	0.0000	0.0000	5.1550
Po-212	0.29800E-06	s	1.01	863.7	5.4294E-02	0.0000	0.0000	0.0000	8.7850
Tl-208	3.0530	m	0.13	2.9773E+11	3.0449E-02	3.3800	0.5598	0.0000	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000	4.8130
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000	4.4770
Bi-210	5.0120	d	0.10	6.2587E+13	2.7076E-03	0.0004	0.3890	0.0000	4.6480
Pb-210	22.160	y	0.54	1.0101E+17	2.7060E-03	0.0045	0.0061	0.0000	0.0000
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000	4.7900
Pa-233	27.000	d	0.37	3.2590E+14	2.6172E-03	0.2175	0.0664	0.0000	0.0000
Po-210	138.40	d	0.00	1.1839E+15	1.8548E-03	0.0000	0.0000	0.0000	5.3040
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000	4.1930
Th-234	24.090	d	0.12	1.4646E+14	1.3183E-03	0.0094	0.0478	0.0000	0.0000
Pa-234m	1.1700	m	2.56	4.9399E+09	1.3183E-03	0.0160	0.8101	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	1279.	1.4642E-04	0.0002	0.0000	0.0000	7.6870
Rn-218	0.35000E-01	s	25.71	2.7356E+05	1.4642E-04	0.0008	0.0000	0.0000	7.1280
Ra-222	38.000	s	1.32	2.9701E+08	1.4642E-04	0.0092	0.0000	0.0000	6.5470
Th-226	30.570	m	0.33	1.4336E+10	1.4642E-04	0.0085	0.0000	0.0000	6.3060
U-230	20.800	d	10.09	1.4032E+13	1.4627E-04	0.0029	0.0000	0.0000	5.8680
Pa-231	32771.	y	0.34	1.6774E+18	3.0387E-05	0.0394	0.0000	0.0000	4.9240
Pa-234	6.7810	h	0.44	2.5767E+09	1.9774E-06	1.9000	0.2120	0.0000	0.0000
Ac-227	21.770	y	0.01	2.4281E+13	6.6211E-07	0.0002	0.0097	0.0000	0.0702
Th-227	18.720	d	0.03	5.0444E+10	5.8427E-07	0.1595	0.0000	0.0000	5.8900
Po-215	0.17800E-02	s	0.56	52.35	5.5098E-07	0.0000	0.0000	0.0000	7.3920
Ra-223	11.430	d	0.17	2.9045E+10	5.5098E-07	0.1351	0.0000	0.0000	5.6640
Rn-219	3.9600	s	1.26	1.1647E+05	5.5098E-07	0.0560	0.0000	0.0000	6.7530
Pb-211	36.100	m	0.55	6.3694E+07	5.5089E-07	0.0637	0.4455	0.0000	0.0000
Bi-211	2.1700	m	1.84	3.8287E+06	5.5088E-07	0.0474	0.0005	0.0000	6.5490
Tl-207	4.7700	m	0.63	8.3928E+06	5.4937E-07	0.0029	0.4953	0.0000	0.0000
Th-230	75392.	y	0.40	6.6706E+16	5.2526E-07	0.0004	0.0000	0.0000	4.6640
U-237	6.7500	d	0.15	1.1531E+10	3.7040E-07	0.1440	0.0678	0.0000	0.0000
Th-229	7339.2	y	2.18	4.5475E+15	3.6783E-07	0.0340	0.0000	0.0000	4.9210
Ra-225	14.800	d	1.35	2.3101E+10	3.3843E-07	0.0137	0.0970	0.0000	0.0000
Ac-225	10.000	d	1.00	1.4692E+10	3.1857E-07	0.0176	0.0000	0.0000	5.7880
At-217	0.32300E-01	s	1.24	549.3	3.1856E-07	0.0002	0.0000	0.0000	7.0630
Fr-221	4.9000	m	4.08	4.9994E+06	3.1856E-07	0.0287	0.0000	0.0000	6.3590
Bi-213	45.580	m	0.13	4.6490E+07	3.1846E-07	0.0831	0.4240	0.0000	0.1222
Pb-209	3.2530	h	0.43	1.9893E+08	3.1823E-07	0.0001	0.1975	0.0000	0.0000
Po-213	0.42000E-05	s	19.05	6.9864E-02	3.1162E-07	0.0000	0.0000	0.0000	8.3760

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 80
Total activity (Ci) = 2.8194

Total number of decays = 6.87648E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80510E-03
Average chain length = 11.185

Average gamma E (MeV) = 5.27687E-02
Average beta E (MeV) = 2.29952E-02
Average alpha E (MeV) = 3.4305

Composite Exposure Rate Conversion Factor = 0.996207416 R/hr per Ci/m2
Composite ECF per FGR table = 0.956586361 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.659608603 Rem/hr per Ci/m2

Actinide Source

Point in time = 333.626343 day

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8839E+22	0.7101	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	5.9094E+13	0.7097	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3434E+19	0.3693	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
Th-228	1.9130	y	0.03	3.3681E+17	0.1045	0.0031	0.0000	0.0000
Ra-224	3.6400	d	0.82	1.7313E+15	0.1031	0.0104	0.0000	0.0000
Po-216	0.15000	s	3.33	8.2576E+08	0.1031	0.0000	0.0000	0.0000
Rn-220	55.800	s	0.54	3.0718E+11	0.1031	0.0006	0.0000	0.0000
Pb-212	10.640	h	0.09	2.1052E+14	0.1030	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	1.9961E+13	0.1029	0.1040	0.3164	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Po-240	6563.1	y	0.08	8.1622E+20	7.3829E-02	0.0000	0.0000	0.0000
Pu-212	0.29800E-06	s	1.01	1049.	6.5947E-02	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	3.6163E+11	3.6984E-02	3.3800	0.5598	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Bi-210	5.0120	d	0.10	6.2242E+13	2.6926E-03	0.0004	0.3890	0.0000
Pb-210	22.160	y	0.54	1.0045E+17	2.6910E-03	0.0045	0.0061	0.0000
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000
Pa-233	27.000	d	0.37	3.2628E+14	2.6202E-03	0.2175	0.0664	0.0000
Po-210	138.40	d	0.00	1.3367E+15	2.0941E-03	0.0000	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-234	24.090	d	0.12	1.4652E+14	1.3188E-03	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	4.9418E+09	1.3188E-03	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.7045E+18	3.0878E-05	0.0394	0.0000	0.0000
Po-214	0.16370E-03	s	0.12	139.6	1.5971E-05	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	2.9838E+04	1.5971E-05	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	3.2395E+07	1.5971E-05	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	1.5636E+09	1.5970E-05	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	1.5305E+12	1.5954E-05	0.0029	0.0000	0.0000
Pa-234	6.7810	h	0.44	2.5777E+09	1.9782E-06	1.9000	0.2120	0.0000
Ac-227	21.770	y	0.01	3.0633E+13	8.3532E-07	0.0002	0.0097	0.0000
Th-227	18.720	d	0.03	6.5127E+10	7.5434E-07	0.1595	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	68.69	7.2298E-07	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	3.8112E+10	7.2298E-07	0.1351	0.0000	0.0000
Rn-219	3.9600	s	1.26	1.5283E+05	7.2298E-07	0.0560	0.0000	0.0000
Pb-211	36.100	m	0.55	8.3580E+07	7.2288E-07	0.0637	0.4455	0.0000
Bi-211	2.1700	m	1.84	5.0240E+06	7.2288E-07	0.0474	0.0005	0.0000
Tl-207	4.7700	m	0.63	1.1013E+07	7.2089E-07	0.0029	0.4953	0.0000
Th-230	75392.	y	0.40	8.3309E+16	6.5599E-07	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	5.6793E+15	4.5938E-07	0.0340	0.0000	0.0000
Ra-225	14.800	d	1.35	2.9350E+10	4.2998E-07	0.0137	0.0970	0.0000
Ac-225	10.000	d	1.00	1.8915E+10	4.1012E-07	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	707.1	4.1011E-07	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	6.4362E+06	4.1011E-07	0.0287	0.0000	0.0000
Bi-213	45.580	m	0.13	5.9853E+07	4.1000E-07	0.0831	0.4240	0.0000
Pb-209	3.2530	h	0.43	2.5616E+08	4.0978E-07	0.0001	0.1975	0.0000
Po-213	0.42000E-05	s	19.05	8.9946E-02	4.0119E-07	0.0000	0.0000	0.0000
Fr-223	21.800	m	1.84	8.0480E+05	1.1527E-08	0.0634	0.3427	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021073D+26

Total number of nuclides = 80
Total activity (Ci) = 2.9455

Total number of decays = 6.87654E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80514E-03
Average chain length = 11.185

Average gamma E (MeV) = 5.96254E-02
Average beta E (MeV) = 2.58216E-02
Average alpha E (MeV) = 3.4784

Composite Exposure Rate Conversion Factor = 1.11010480 R/hr per Ci/m2
Composite ECF per FGR table = 1.08072460 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.745317638 Rem/hr per Ci/m2

Actinide Source

Point in time = 1.14079583 yrs

Top 50 most active radionuclides

Isotope	Half-life +/-	pct	Atoms	Curies	Total Energy Output (Mev)			
					gamma	beta(-)	beta(+)	alpha
Pu-239	24111.	y	0.05	2.8839E+22	0.7101	0.0001	0.0000	0.0000
U-235m	26.000	m	7.69	5.9094E+13	0.7096	0.0000	0.0000	0.0000
U-232	69.811	y	0.72	4.3336E+19	0.3685	0.0002	0.0000	0.0000
Th-231	1.0630	d	0.04	6.2607E+14	0.1277	0.0225	0.0794	0.0000
U-235	0.70381E+09	y	0.07	1.5140E+26	0.1277	0.1560	0.0000	0.0000
Th-228	1.9130	y	0.03	4.0419E+17	0.1254	0.0031	0.0000	0.0000
Ra-224	3.6400	d	0.82	2.0842E+15	0.1242	0.0104	0.0000	0.0000
Po-216	0.15000	s	3.33	9.9408E+08	0.1242	0.0000	0.0000	0.0000
Rn-220	55.800	s	0.54	3.6980E+11	0.1242	0.0006	0.0000	0.0000
Pb-212	10.640	h	0.09	2.5353E+14	0.1240	0.1437	0.0998	0.0000
Bi-212	1.0090	h	0.10	2.4040E+13	0.1240	0.1040	0.3164	0.0000
Po-212	0.29800E-06	s	1.01	1263.	7.9423E-02	0.0000	0.0000	0.0000
U-234	0.24571E+06	y	0.12	3.2330E+22	7.8112E-02	0.0001	0.0000	0.0000
Pu-240	6563.1	y	0.08	8.1620E+20	7.3827E-02	0.0000	0.0000	0.0000
Tl-208	3.0530	m	0.13	4.3553E+11	4.4542E-02	3.3800	0.5598	0.0000
U-233	0.15930E+06	y	0.13	1.4290E+21	5.3252E-03	0.0013	0.0000	0.0000
U-236	0.23701E+08	y	0.84	1.6820E+23	4.2131E-03	0.0015	0.0000	0.0000
Bi-210	5.0120	d	0.10	6.1802E+13	2.6736E-03	0.0004	0.3890	0.0000
Pb-210	22.160	y	0.54	9.9742E+16	2.6720E-03	0.0045	0.0061	0.0000
Np-237	0.21400E+07	y	0.47	9.4480E+21	2.6209E-03	0.0320	0.0000	0.0000
Pa-233	27.000	d	0.37	3.2635E+14	2.6208E-03	0.2175	0.0664	0.0000
Po-210	138.40	d	0.00	1.4645E+15	2.2943E-03	0.0000	0.0000	0.0000
U-238	0.44681E+10	y	0.07	9.9270E+24	1.3189E-03	0.0016	0.0000	0.0000
Th-234	24.090	d	0.12	1.4653E+14	1.3189E-03	0.0094	0.0478	0.0000
Pa-234m	1.1700	m	2.56	4.9421E+09	1.3189E-03	0.0160	0.8101	0.0000
Pa-231	32771.	y	0.34	1.7384E+18	3.1492E-05	0.0394	0.0000	0.0000
Pa-234	6.7810	h	0.44	2.5779E+09	1.9783E-06	1.9000	0.2120	0.0000
Ac-227	21.770	y	0.01	3.8661E+13	1.0542E-06	0.0002	0.0097	0.0000
Po-214	0.16370E-03	s	0.12	8.770	1.0037E-06	0.0002	0.0000	0.0000
Rn-218	0.35000E-01	s	25.71	1875.	1.0035E-06	0.0008	0.0000	0.0000
Ra-222	38.000	s	1.32	2.0355E+06	1.0035E-06	0.0092	0.0000	0.0000
Th-226	30.570	m	0.33	9.8248E+07	1.0035E-06	0.0085	0.0000	0.0000
U-230	20.800	d	10.09	9.6163E+10	1.0024E-06	0.0029	0.0000	0.0000
Th-227	18.720	d	0.03	8.3687E+10	9.6931E-07	0.1595	0.0000	0.0000
Po-215	0.17800E-02	s	0.56	89.35	9.4039E-07	0.0000	0.0000	0.0000
Ra-223	11.430	d	0.17	4.9573E+10	9.4039E-07	0.1351	0.0000	0.0000
Rn-219	3.9600	s	1.26	1.9878E+05	9.4039E-07	0.0560	0.0000	0.0000
Pb-211	36.100	m	0.55	1.0872E+08	9.4030E-07	0.0637	0.4455	0.0000
Bi-211	2.1700	m	1.84	6.5351E+06	9.4029E-07	0.0474	0.0005	0.0000
Tl-207	4.7700	m	0.63	1.4326E+07	9.3771E-07	0.0029	0.4953	0.0000
Th-230	75392.	y	0.40	1.0405E+17	8.1927E-07	0.0004	0.0000	0.0000
Th-229	7339.2	y	2.18	7.0928E+15	5.7372E-07	0.0340	0.0000	0.0000
Ra-225	14.800	d	1.35	3.7154E+10	5.4432E-07	0.0137	0.0970	0.0000
Ac-225	10.000	d	1.00	2.4188E+10	5.2446E-07	0.0176	0.0000	0.0000
At-217	0.32300E-01	s	1.24	904.2	5.2445E-07	0.0002	0.0000	0.0000
Fr-221	4.9000	m	4.08	8.2305E+06	5.2445E-07	0.0287	0.0000	0.0000
Bi-213	45.580	m	0.13	7.6542E+07	5.2432E-07	0.0831	0.4240	0.0000
Pb-209	3.2530	h	0.43	3.2764E+08	5.2412E-07	0.0001	0.1975	0.0000
Po-213	0.42000E-05	s	19.05	0.1150	5.1306E-07	0.0000	0.0000	0.0000
Fr-223	21.800	m	1.84	1.0157E+06	1.4548E-08	0.0634	0.3427	0.0000

Check of numerical solution:

Initial number of atoms = 1.615681088021072D+26
Current number of atoms = 1.615681088021072D+26

Total number of nuclides = 80
Total activity (Ci) = 3.0918

Total number of decays = 6.87662E+22
Asympt number of decays = 1.80717E+27
Percent of decays = 3.80518E-03
Average chain length = 11.185

Average gamma E (MeV) = 6.68469E-02
Average beta E (MeV) = 2.87974E-02
Average alpha E (MeV) = 3.5295

Composite Exposure Rate Conversion Factor = 1.23022604 R/hr per Ci/m2
Composite ECF per FGR table = 1.21146560 R/hr per Ci/m2
Composite Whole Body Dose Conversion Factor = 0.835585892 Rem/hr per Ci/m2
