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Technical Basis for the Derivation of Authorized Limits for Units of the Hanford Reach National Monument

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March 2004



Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RL01830

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Summary

This report provides radiation dose modeling analysis supporting the technical derivation of Authorized Limits for selected portions of the Hanford Reach National Monument (HRNM). The RESRAD computer program was used as the calculational model. The goal of this effort was to produce Authorized Limits, in units of pCi/g in soil, for the HRNM that would result in radiation doses that would not exceed 100 mrem/y, in compliance with the requirements of the U.S. Department of Energy (DOE).

To develop the Authorized Limits, a “realistic” yet conservative radiation dose analysis was conducted based on likely use and worst use scenarios and conditions at the HRNM to determine the translation between surface soil concentrations and individual radiation doses. In accordance with the Presidential Proclamation that created the HRNM, the expected end-use, i.e., likely use scenario, for these HRNM lands is recreational use. In accordance with the guidance in DOE G 441.1-XX, *Implementation Guide: Control and Release of Property with Residual Radioactive Material for Use with DOE 5400.5, Radiation Protection of the Public and the Environment*, a dose constraint of 25 mrem/y is applied to this likely use scenario in developing Authorized Limits. A worst use scenario was developed specifically for these HRNM lands being transferred to DOI. This worst use scenario is considered to be a subsistence farmer. In accordance with DOE G 441.1-XX, this scenario represents the situation in which restrictions that control end-use of these HRNM lands fail or the actual end-use is different from the expected end-use. While the Presidential Proclamation and the expected terms and conditions of the transfer of these HRNM lands to DOI would preclude such a worst use scenario, it provides a conservative, bounding scenario to assure that DOE dose limits will not be exceeded in the future by an unlikely agricultural resident on these HRNM lands. Accordingly, for the radiation dose analyses used to develop these Authorized Limits, two types of exposed individuals were identified: 1) recreational users of the HRNM (Avid Recreational Use Scenario), and 2) agricultural residents (Agricultural Resident Scenario). Primary data for these groups and the associated exposure scenarios, including the radionuclides selected for analysis and the parameter and data used as input to the computer models, were obtained from the recent literature and from an Historical Site Assessment. The computer models and data were used to generate Authorized Limits, in units of pCi/g of surface soil, resulting in a dose of 25 mrem/y for the recreational user and 100 mrem/y for the agricultural resident. Authorized Limits were developed for each of the identified radionuclides, for each of the exposure scenarios, for several geographical units of the HRNM. The final Authorized Limits were determined as the most limiting (smallest) soil concentrations for each radionuclide, across the scenarios and HRNM locations.

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1.0 Introduction

The U.S. Department of Energy (DOE) is currently negotiating the release and transfer of select portions of the Hanford Reach National Monument (HRNM) from DOE control to the jurisdiction of the U.S. Fish and Wildlife Service. The cleanup and release of these HRNM lands is a coordinated part of an effort to reduce the size of the Hanford Site from 586 square miles to 75 square miles by 2012. To complete the transfer, DOE must evaluate the potential for residual radioactive contamination in surface soils, and determine compliance with the requirements of DOE Order 5400.5 (DOE 1993). The transfer of these properties would constitute a release from DOE radiological control; therefore, the requirements of DOE Order 5400.5 must be satisfied. Chapter IV, section 5 of Order 5400.5 requires that Authorized Limits be developed for real property and submitted to the applicable DOE headquarters program office for approval. According to DOE Order 5400.5, section II.d, “an Authorized Limit is a level of residual radioactive material that shall not be exceeded if the remedial action is to be considered completed and the property is to be released without restrictions on use due to residual radioactive material.” Residual radioactive material is “any radioactive material which is in or on soil, air, equipment, or structures as a consequence of past operations or activities” (5400.5, Definitions); it is understood that this definition means DOE operations or activities. Therefore, the approval of Authorized Limits is DOE’s method for controlling the amount of residual radioactivity on real property that is released for either restricted or unrestricted use.

DOE Order 5400.5 states that: “The basic public dose limits for exposure to residual radioactive material, in addition to natural occurring “background” exposures, are 100 mrem (1 mSv) effective dose equivalent in a year”. DOE Order 5400.5 requires that: “The Authorized Limits shall be established to 1) provide that, at a minimum, the basic dose limits ... will not be exceeded, or 2) be consistent with applicable generic guidelines.” Since generic guidelines have not been established for volumetric residual radioactivity for the radionuclides of concern for these select HRNM lands, the Authorized Limits derived in this document have been established to ensure that the public dose limit of 100 mrem per year is not exceeded.

This report provides the radiation dose modeling analysis supporting the technical derivation of the Authorized Limits for portions of the HRNM. The RESRAD (Yu et al. 2001) computer program was used as the calculational model. The goal of this effort was to produce Authorized Limits, in units of pCi/g in soil above background, for the HRNM that would result in radiation doses less than 100 mrem/y to any member of the public. To develop the Authorized Limits, a “realistic” yet conservative radiation dose analysis was conducted based on likely use and worst use scenarios and conditions at the HRNM to determine the translation between surface soil concentrations and individual radiation doses. For this analysis, two potential groups of exposed individuals were identified: 1) recreational users of the HRNM (likely use scenario), and 2) potential future agricultural residents (worst use scenario). Primary data for these critical groups and the associated exposure scenarios, including the radionuclides selected for analysis and the parameter and data used as input to the computer models, were obtained from the recent literature with minor modifications (Napier and Snyder 2002; WDOH 1997) and an Historical Site Assessment performed for the site (Fritz et al. 2003). The computer models and data were used to generate Authorized Limits, in units of picocuries per gram of surface soil, resulting in a dose of

25 mrem/y for the recreational user and 100 mrem/y for the agricultural resident, above background, for each identified radionuclide and exposure scenario for several distinct areas within the HRNM.

It is recognized that there is a good deal of uncertainty associated with the future activities associated with HRNM use by the identified types of individuals, or other potential types not considered in detail. To compensate for this uncertainty, the overall Authorized Limits identified in this analysis were selected as the smallest (most limiting) soil concentration for each radionuclide across the two scenarios. In this manner, conservative Authorized Limits were developed such that it is unlikely that any user of the HRNM would receive a dose in excess of 100 mrem/y. The Authorized Limit for any mixture of the radionuclides is found using the sum of fractions^(a) rule. The following sections define the radionuclides considered, establish the exposure scenarios for the critical groups, define the exposure pathways and key input data or assumptions, present radiation doses for unit concentrations of radionuclides in soil, present the Authorized Limits, and discuss the results.

(a) A determination of whether or not a radionuclide mixture meets the Authorized Limits described in this report is made if the sum, over all radionuclides in the mixture, of the measured concentration of each radionuclide divided by its Authorized Limit is less than or equal to one.

2.0 Reference Radionuclides

Since 1943, the Hanford Site has been home to several nuclear fuel cycle facilities associated with the manufacture of nuclear fuel, operation of nuclear reactors used to produce plutonium, separation of spent reactor fuel to recover plutonium and high-level radioactive waste, purification of recovered plutonium, and management of radioactive waste. In addition, numerous research and development projects were conducted using various radioactive materials. As the result of these historical operations, radionuclides were potentially transported and deposited onto (or may otherwise be present on) HRNM lands.

To support the development of Authorized Limits for the HRNM, Pacific Northwest National laboratory (PNNL) was asked to conduct an Historical Site Assessment of the HRNM lands on three portions of the Hanford Site: 1) the Fitzner-Eberhardt Arid Lands Ecology (ALE) Reserve unit, 2) the McGee Ranch/Riverlands, and 3) the North Slope. The results of the PNNL effort are documented in *Hanford Site Assessment: Select Hanford Reach National Monument Lands-Fitzner-Eberhardt Arid Lands Ecology Reserve (ALE), McGee Ranch, Riverlands, and Wahluke Slope* (Fritz et al. 2003). In general, from the data available, it is concluded that the HRNM lands have very low concentrations of radionuclides that are very near the analytical detection levels, making comparisons of values from different locations difficult. The data do not indicate the likelihood of the transport and deposition of significant amounts of long-lived radioactive materials from Hanford Site operations. Further, the atmospheric fallout from above ground nuclear weapons testing significantly contributed to the levels of residual radionuclide contamination measured in Hanford soils.

Although a broad spectrum of radionuclides, including activation products, fission products, transuranics, and uranium potentially contributed to the residual soil contamination, only the longer-lived and insoluble radionuclides would be expected to be encountered today (i.e., radionuclides with half-lives greater than about 5 years would have decayed, volatile ones would have dispersed, and soluble ones would have migrated to deeper soil horizons). Several of these radionuclides are also present in either fallout from atmospheric nuclear weapons testing (i.e., ^{90}Sr , ^{137}Cs , and ^{239}Pu), or naturally occurring in the earth's crust (i.e., ^{234}U , ^{235}U , and ^{238}U). Table 2.1 lists the radionuclides produced by Hanford operations that were considered for the Authorized Limits analysis.

Table 2.1. Radionuclides Evaluated and Their Respective Half-Lives

Radionuclide	Half-Life (years)
⁶⁰ Co	5.3
⁹⁰ Sr	29
¹³⁴ Cs	2
¹³⁷ Cs	30
¹⁵² Eu	13
²³⁴ U	240,000
²³⁵ U	703,000,000
²³⁸ U	4,500,000,000
²³⁹ Pu	24,000
²⁴⁰ Pu	6,500
²⁴¹ Am	430

3.0 Radiation Exposure Pathways and Scenarios

For this analysis, two potential types of maximally exposed individuals are identified, consistent with the identified future use of the HRNM: 1) recreational users of the HRNM, and 3) agricultural residents. The key exposure pathways and parameters for the scenarios used to model radiation doses to the maximally exposed individuals are shown in Table 3.1. The key parameters for the Recreational Visitor and Agricultural Resident scenarios are consistent with those documented in Napier and Snyder (2002). Additional parameters were established based on consideration of information provided by the Washington State Department of Health (WDOH 1997). Other parameters needed for the RESRAD computer program were selected based on those identified in Napier and Snyder (2002), with some minor modifications to adjust for the input requirements in RESRAD.

The following paragraphs contain detailed descriptions of the radiation exposure scenarios, pathways, and key parameters or assumptions considered in this study.

3.1 Analysis Locations

The HRNM units under consideration for release cover about 700 km² (about 270 square miles). To account for potential differences in exposure conditions in this large area, the analysis was subdivided into five separate portions. These portions, illustrated in Figure 3.1, include the Wahluke Unit, the Saddle Mountain Unit, the McGee Ranch and Riverlands Units, and the Fitzner-Eberhardt Arid Lands Ecology Reserve Unit. These areas have slightly different topographies, soil types, and plant communities (sometimes caused by recent range fires), although all are essentially similar.

Both the Wahluke and Saddle Mountain Units currently contain surface water ponds, fed by irrigation runoff, that are accessible for public fishing. The other units do not have permanent surface water bodies; however, they are adjacent to irrigated areas and potentially could support small ponds.

The RESRAD code accounts for the size of potentially contaminated areas, and reduces potential radiation exposures accordingly through an *area factor*. For conservatism, the analyses assume that the entire area of each of the HRNM units is uniformly contaminated. The dimensions of each unit (roughly approximated as large rectangles) as used for input to the RESRAD code are listed in Table 3.1. Because the RESRAD groundwater transport model requires a representative length parallel to the direction of groundwater flow, the rectangles were sized to maximize the up-gradient area.

Table 3.1. HRNM Units Used for RESRAD Modeling

HRNM Unit	Approx. Length (km)	Approx. Width (km)	Area (km ²)
Wahluke	25	7	175
Saddle Mountain	25	8	200
Riverlands	6	3	18
McGee Ranch	6	3	18
Arid Lands Ecology Reserve	32	9	288

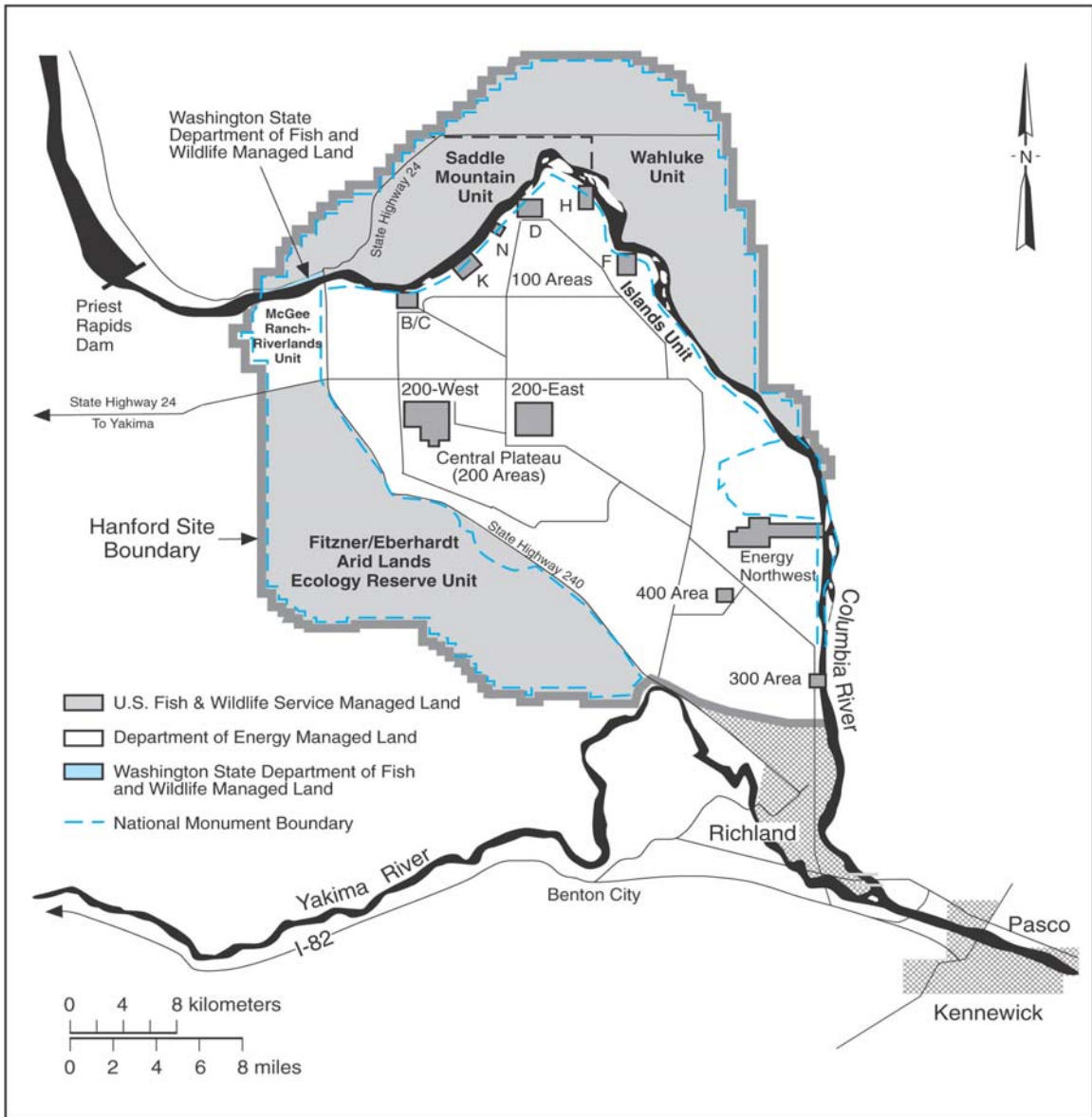


Figure 3.1. Hanford Reach National Monument Units Considered in Modeling

3.2 Recreational Visitor Scenario

The Recreational Visitor scenario is intended to represent potential radiation exposures to an individual who may visit the HRNM on a frequent basis. A variety of activities could be identified to represent potential future use of the HRNM. These activities could vary from rather infrequent seasonal visits for activities such as migratory bird watching to frequent visits for hiking, fishing, or other day-use activities. For purposes of this analysis, an avid individual is assumed to visit the site a total of 280 h/y. As shown in Table 3.2, the exposure pathways considered are external exposure, inhalation of resuspended material (surface soils), incidental ingestion of soil, and ingestion of game and fish from a surface pond. As part

Table 3.2. Key Parameters Used for the Recreational Visitor and Agricultural Resident Scenarios for Unit of the Hanford Reach National Monument

Pathway Parameters	Recreational Visitor	Agricultural Resident
Cover/Hydrology		
Irrigation rate, m/y	--	0.76
Surface Water/ Hydrology		
Effective watershed, m ²	1.1x10 ⁹	1.1x10 ⁹
External Exposure		
Years	30	30
Time indoors, fraction	0.0	0.60
Time outdoors, fraction	0.032	0.20
Shielding	1.0	0.8
Soil density, g/cc	1.6	1.6
Inhalation		
Breathing rate, m ³ /y	21,900	7300
Mass loading, g/m ³	0.000025	0.000050
Dust filtration factor	1.0	0.4
Soil Ingestion		
Ingestion rate, g/y	219.0	36.5
Other Ingestion		
Groundwater, L/y	--	730
Fruit, vegetable, grain, kg/y	0	110
Leafy vegetable, kg/y	0	2.7
Milk, L/y	0	100
Meat and fowl, kg/y	21.6	36
Fish, kg/y	19.7	5.4
Other seafood, kg/y	0	0
Contaminated fraction:		
Aquatic food intake	1.0	0.5
Vegetation intake	--	1.0
Meat intake	1.0	1.0
Milk intake	--	1.0

of the individual's avid use of the HRNM, the individual is assumed to hunt (both birds and large game), and obtain fish from irrigation water runoff ponds. Consistent with the currently identified future use of the site, local surface or groundwater is not assumed to be ingested by the Recreational Visitor.

The external exposure scenario for the Recreational Visitor scenario is treated by the RESRAD computer program as the product of the dose rate from an infinite slab of contaminated soil without the benefit of shielding (i.e., no time is assumed to be spent indoors by the Recreational Visitor). The effective fraction of time spent outdoors for this analysis is simply 280 h/y divided by 8,760 h/y, or 0.032. This fraction of time is called the *occupancy factor* in RESRAD.

The RESRAD inhalation exposure parameters for the Recreational Visitor scenario include the effective breathing rate (cubic meters of air per year inhaled), the air concentration obtained using a mass loading

factor (grams of dust per cubic meter of air), particle size, and dust filtration factor. Recent measurements of PM₁₀, the particles less than 10 µm in aerodynamic median activity diameter—respirable size—account for only a fraction of the total dust loading. Recent data from a particulate sampler located in the Hanford 200 Area for the period February 2001 through June 2002 (Napier and Snyder 2002, Appendix C) indicate that the mean air concentration of PM₁₀ particulate in the 200 Areas, in an outdoor area influenced by the Hanford 24 Command wildfire in 2000, is only 21 µg/m³. The 95th percentile daily value is only 36.5 µg/m³. As shown in Table 3.2, the parameters combine as 700 m³ of air per year inhaled, a particle size of 1 µm, a mass loading factor of 25 µg/m³ of air, and a dust filtration factor of 1.0 (i.e., no filtration). Because the RESRAD code applies the occupancy factor to the air inhalation rate, the actual code input is 700/0.032, or 21,900 m³/y.

The RESRAD incidental soil ingestion rate for the Recreational Visitor scenario is assumed to be 25 mg/h of exposure, for a total of 7.0 g/y. Because the RESRAD code applies the occupancy factor to the soil ingestion rate, the actual code input is 7/0.032, or 219 g/y.

In addition to soil ingestion, the Recreational Visitor is assumed to hunt both birds and large game (deer and elk), consuming a total of 22 kg/y of wild game. The concentrations in game were estimated using the default RESRAD parameter settings for domestic meat.

Finally, the Recreational Visitor is assumed to fish in irrigation runoff ponds and to ingest 20 kg/y of fish. Such ponds currently exist in both the Wahluke and Saddle Mountain units of the Hanford North Slope; irrigation also occurs to the west of the Arid Lands Ecology Reserve and McGee Ranch units, so the creation of similar ponds in these areas is at least possible. Additionally, small springs exist on ALE and McGee Ranch, which could be used to feed ponds.

3.3 Agricultural Resident Scenario

The Columbia Basin area is extensively farmed. The Agricultural Resident Scenario involves consumption of locally produced food and animal products in addition to the external exposure, inhalation, and soil ingestion pathways. In interim guidance developed specifically for the Hanford Site, the WDOH (1997) has defined a set of RESRAD input parameters that differ from the RESRAD default template as shown in Table 3.2. The advantage of the WDOH set of parameters is that the environmental parameters are all related to the Hanford Site. Neither consumption of Columbia River water nor site groundwater is considered for this scenario.

The only parameter revised from the WDOH parameters is the mass loading of dust in air for the inhalation pathway. Because the dust in frequented areas such as dirt roads might be enhanced because of mechanical disturbances, an annual average mass loading value of 50 µg/m³ is appropriate.

For reasons similar to those described above for the Recreational Visitor Scenario, the local fish consumption is assumed to be from an irrigation-runoff-fed pond, rather than a groundwater-fed pond. Note that the Agricultural Resident Scenario does not consider water consumption directly from this pond, groundwater, or from the Columbia River.

3.4 Common Parameters

For purposes of the radiation dose analysis, each radionuclide was assumed to be present at an arbitrary concentration uniformly distributed within the top 15 cm of soil. As discussed in Napier and Snyder (2002), the original justification of the 15 cm was that it represents the mixed layer in routinely plowed fields (e.g., Soldat and Harr 1971; Napier et al. 1988). This is appropriate for agricultural scenarios, but not recreational scenarios. Numerous studies have indicated that airborne fallout on undisturbed soils distributes within a surface layer of 5 to 20 cm, with most of it remaining within the rooting zone of local vegetation (e.g., Aarkrog et al. 1992; Anderson and Roed 1994; Bunzl et al. 1994). This result was also found for the areas of Hanford under consideration (Fritz et al. 2003). Following the Chernobyl accident, numerous observations of this sort were made, with similar results. The transfer rate for vertical redistribution is quite slow, and there is little difference for different chemical elements (Vargo 2000). There are two primary mechanisms for this incorporation in soil: leaching with infiltrating precipitation and biological transport (bioturbation – movement by worms, insects, and other subterranean life). Thus, even soils undisturbed by agricultural activities reach a reasonably uniform distribution of activity in the upper 0-15 cm. The rooting zone of most agricultural plants is the upper 5 to 15 cm. The soil-to-plant transfer factors used in RESRAD are implicitly applicable to soils of this thickness. Finally, soil is a good shield for gamma radiation. The dose rate from gamma-emitting radionuclides in soils increases with soil thickness up to depths of approximately 15 cm, at which point the dose rate does not increase further because radiation from contaminants deeper than 15 cm are shielded by the soil above. (This may be confirmed by comparing the dose coefficients for exposure to soil contaminated to a depth of 15 cm with those for soil contaminated to infinite depth in Federal Guidance Report 12 [Eckerman and Ryman 1993].) Thus, this is a conservative lower bound for soil thickness in this type of calculation.

It is difficult to model the water concentration of the ponds using the RESRAD computer program. The RESRAD aquatic food pathway is for ingestion of fish that live in a pond located at the downgradient edge of the contaminated soil zone and is not appropriate for fish in the Columbia River. The pond is assumed to have been contaminated by radionuclides that have leached from the soil to groundwater and then flowed into the pond. RESRAD calculates radionuclide concentrations in the pond and assumes the entire volume of the pond is uniformly contaminated. Fish that live in the pond uptake radionuclides from the pond water. RESRAD calculates radionuclide concentrations in fish using biological uptake factors. Unfortunately, the RESRAD model for radionuclide concentrations in the water of the pond is based on dilution of the inflowing contaminated groundwater with other, uncontaminated, groundwater. The dilution factor f_2 is given as RESRAD Equation E.31 (Yu et al. 2001):

$$f_2 = A/A_w$$

where A is the area of the waste site and A_w is the area of the watershed that feeds the pond. The actual situation for the semi-permanent ponds in the HRNM is that they are created by inflows of irrigation wastewater. They are groundwater sources, not sinks. Major ponds exist south of Highway 24 east of Vernita and on the plateau east of the White Bluffs public boat launch site. The flow into and out of the ponds is on the order of several cubic feet per second, as observed flowing from the wasteways back into the Columbia River, which would act as a major dilution to inflowing groundwater contaminants. Because of this situation, the RESRAD model can only estimate the conditions in the ponds if the dilution

calculation is overridden in such a way as to approximate the high levels of dilution. This may be accomplished by estimating an input value for A_w that results in the appropriate dilution. Napier and Snyder (2002) estimate that an appropriate value for A_w is $1.1 \times 10^9 \text{ m}^3$.

The thickness of contaminated zone, thickness of the unsaturated zone, and length parallel to aquifer flow are three parameters that describe the migration of contaminants from surface soil into groundwater. For the generally distributed potential contamination within the HRNM, a contaminated zone thickness of 15 cm is used. The thickness of the unsaturated zone varies over the Hanford Site from near zero to over 150 m; a conservative value of 12 m was taken from the WDOH (1997) recommendations. The length parallel to the aquifer is specific to the individual units within the HRNM that were separately analyzed; these widths are listed in Table 3.1.

Distribution coefficients from Napier and Snyder (2002) Table 3.1 were used for surface soil and from Napier and Snyder (2002) Table 3.2 for vadose zone and aquifer.

4.0 Estimated Radiation Doses for the Exposure Scenarios

As the first step in developing Authorized Limits for the HRNM, radiation doses above background for each of the identified scenarios were developed using a standard concentration (100 pCi/g) of each radionuclide in soil. The results can be normalized to scenario unit dose factors, with units of millirem per year per picocurie per gram of soil. The following paragraphs present the normalized radiation doses produced for this analysis.

4.1 Doses from the Recreational Visitor Scenario

The normalized radiation doses estimated for the Recreational Visitor scenario are summarized in Table 4.1 for each radionuclide and location considered in this analysis. The detailed RESRAD output is included in Appendix A. The results vary only slightly between the various locations. The major location-to-location variability is the result of the RESRAD area factor to the inhalation pathway. The dominant exposure pathway in this scenario varies by radionuclide. For those radionuclides with little variability, the dominant pathway is either external exposure to soils (^{60}Co , $^{134,137}\text{Cs}$, and ^{152}Eu) or ingestion (^{90}Sr). The others have a significant inhalation component.

For all radionuclides in all locations, the normalized doses are highest at the beginning time of the analysis. They decrease monotonically with time through decay and erosion loss. For radionuclides with chain decay ingrowth of progeny over long (thousand-year) periods, the decay ingrowth is also less than the decay and erosion loss. In no case were groundwater-migration-related pathways of consequence; the primary exposure is via the contamination of the soil in the immediate vicinity. The largest normalized doses, leading to the minimum Authorized Limits, occur for the Fitzner-Eberhardt Arid Lands Ecology Reserve Unit of the HRNM. This is because of the large area of this unit; the RESRAD area factor is maximized for the inhalation pathway.

Table 4.1. Normalized Doses for the Recreational Visitor Scenario, mrem/y per pCi/gram

Nuclide	HRNM Unit				
	Wahluke	Saddle Mountain	Riverlands	McGee Ranch	ALE
^{241}Am	3.21E-02	3.21E-02	3.17E-02	3.15E-02	3.23E-02
^{60}Co	4.32E-01	4.32E-01	4.32E-01	4.32E-01	4.32E-01
^{134}Cs	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01
^{137}Cs	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01
^{152}Eu	1.92E-01	1.92E-01	1.92E-01	1.92E-01	1.92E-01
^{239}Pu	3.18E-02	3.19E-02	3.14E-02	3.13E-02	3.20E-02
^{240}Pu	3.18E-02	3.19E-02	3.14E-02	3.13E-02	3.20E-02
^{90}Sr	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01
^{234}U	4.05E-03	4.06E-03	3.93E-03	3.88E-03	4.09E-03
^{235}U	2.71E-02	2.71E-02	2.70E-02	2.69E-02	2.72E-02
^{238}U	8.17E-03	8.18E-03	8.05E-03	8.01E-03	8.20E-03

Because the normalized doses are so similar across the HRNM locations, the largest was selected for application to all HRNM areas.

4.2 Doses from the Agricultural Resident Scenario

The normalized radiation doses estimated for the Agricultural Resident scenario are summarized in Table 4.2 for each radionuclide and location considered in this analysis. The detailed RESRAD output is included in Appendix B. The results vary only slightly between the various locations. The major location-to-location variability is the result of the RESRAD area factor to the inhalation pathway. The dominant exposure pathway in this scenario varies by radionuclide. For those radionuclides with little variability, the dominant pathway is either external exposure to soils (^{60}Co , $^{134,137}\text{Cs}$, and ^{152}Eu) or ingestion (^{90}Sr). The others have a significant inhalation component.

For all radionuclides in all locations, the normalized doses are highest at the beginning of the analysis. They decrease monotonically with time through decay and erosion loss. For radionuclides with chain decay ingrowth of progeny over long (thousand-year) periods, the decay ingrowth is also less than the decay and erosion loss. In no case were groundwater-migration-related pathways of consequence; the primary exposure is via the contamination of the soil in the immediate vicinity. The largest normalized doses, leading to the minimum Authorized Limits, occur for the Fitzner-Eberhardt Arid Lands Ecology Reserve Unit of the HRNM. This is because of the large area of this unit; the RESRAD area factor is maximized for the inhalation pathway.

Because the normalized doses are so similar across the HRNM locations, the largest was selected for application to all HRNM areas.

Table 4.2. Normalized Doses From the Agricultural Resident Scenario, mrem/y per pCi/gram

Nuclide	HRNM Unit				
	Wahluke	Saddle Mountain	Riverlands	McGee Ranch	ALE
^{241}Am	2.39E-01	2.39E-01	2.35E-01	2.33E-01	2.40E-01
^{60}Co	8.90E+00	8.90E+00	8.90E+00	8.90E+00	8.90E+00
^{134}Cs	5.08E+00	5.08E+00	5.08E+00	5.08E+00	5.08E+00
^{137}Cs	2.20E+00	2.20E+00	2.20E+00	2.20E+00	2.20E+00
^{152}Eu	4.08E+00	4.08E+00	4.08E+00	4.08E+00	4.08E+00
^{239}Pu	2.07E-01	2.07E-01	2.03E-01	2.01E-01	2.08E-01
^{240}Pu	2.06E-01	2.07E-01	2.03E-01	2.01E-01	2.08E-01
^{90}Sr	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00
^{234}U	4.06E-02	4.07E-02	3.95E-02	3.90E-02	4.10E-02
^{235}U	5.23E-01	5.23E-01	5.22E-01	5.22E-01	5.24E-01
^{238}U	1.29E-01	1.29E-01	1.28E-01	1.28E-01	1.30E-01

5.0 Authorized Limits

This section describes the derived Authorized Limits for radionuclide contaminations above background in soils and considerations of inhomogeneity in soil concentrations.

5.1 Derived Authorized Limits

Table 5.1 provides an overall summary of the maximum normalized radiation doses for each radionuclide and scenario, in units of mrem/y per pCi/g in soil, and the derived Authorized Limits, in units of pCi/g of soil at 25 mrem/y (Recreational Visitor) or 100 mrem/y (Agricultural Resident). These derived Authorized Limits are calculated using the maximum scenario doses by radionuclide, across all HRNM locations, for the Agricultural Resident Scenario (which gives lower Authorized Limits for all radionuclides than the Recreational Visitor). The Agricultural Resident Scenario is a “worst-case” for future exposures to the public following release of lands from DOE control. Because the lands are to be released to the jurisdiction of the USFWS as part of the HRNM, occupancy by the public is not expected. Exposures such as those described for the Recreational Visitor represent the upper bounds of likely use exposures. The derived Authorized Limits to the Agricultural Resident are factors of 1.6 to 5.4 times more restrictive, depending on the radionuclide, than those for the Recreational Visitor. Accordingly, the Agricultural Resident values are selected as the requested Authorized Limits.

The Authorized Limit for any mixture of the reference radionuclides above background shown in Table 5.1 is found using the sum of fractions rule. A determination of whether a radionuclide mixture meets the Authorized Limits is made if the sum, over all radionuclides in the mixture, of the measured concentration

Table 5.1. Maximal Normalized Doses and Resulting Derived Authorized Limits for Radionuclides in Soil on the Hanford Reach National Monument

Radionuclide	Recreational Visitor		Agricultural Resident	
	mrem/y per pCi/g	Derived Authorized Limit, pCi/g*	mrem/y per pCi/g	Derived Authorized Limit, pCi/g ^(a)
²⁴¹ Am	3.23E-02	770	2.40E-01	420
⁶⁰ Co	4.32E-01	58	8.90E+00	11
¹³⁴ Cs	2.70E-01	93	5.08E+00	20
¹³⁷ Cs	1.28E-01	200	2.20E+00	46
¹⁵² Eu	1.92E-01	130	4.08E+00	24
²³⁹ Pu	3.20E-02	780	2.08E-01	480
²⁴⁰ Pu	3.20E-02	780	2.08E-01	480
⁹⁰ Sr	1.04E-01	240	1.14E+00	88
²³⁴ U	4.09E-03	6100	4.10E-02	2400
²³⁵ U	2.72E-02	920	5.24E-01	190
²³⁸ U	8.20E-03	3000	1.30E-01	770

(a) Rounded to two significant figures.

of each radionuclide divided by its Authorized Limit is less than or equal to one. Mathematically, the sum of fractions rule is as follows:

$$\sum_{i=1}^n C_i / AL_i \leq 1$$

where: C_i = the measured concentration of radionuclide i in soil,
 AL_i = the Authorized Limit for radionuclide i , and
 n = the number of radionuclides in the mixture.

5.2 Area Averaging/Hot-Spot Criterion

DOE Order 5400.5 (DOE 1993) states: “Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m²” (5400.5, IV, 4.a.)

The Historical Site Assessment concluded that the concentrations in the soil are expected to be at (or very near) background levels and that there is no reason to believe that there are significant variations in the concentrations across the site. Thus, there is no reason to adopt a minimum survey area of 100 m² to ensure the sampling method is representative. Therefore, because the expected soil concentrations on this site are far below those that would result in a dose equal to the dose limit (100 mrem/y), and because there is no need to adopt the 100 m² averaging area to ensure representativeness, the 100 m² averaging area need not be used in developing a survey plan to demonstrate compliance with the Authorized Limits.

DOE Order 5400.5 states: “If the average concentration of any surface or below-surface area less than or equal to 25 m², exceeds the limit or guideline by a factor of (100/A)^{0.5}, [where A is the area (in square meters) of the region in which concentrations are elevated], limits for “hot-spots” shall also be developed and applied” (5400.5, IV, 4.a.(1)).

DOE G 441.1-XX (DOE 2002) discusses the rationale for the hotspot criterion in Section 5.2.2. The hot spot criterion is used to supplement Authorized Limits for larger areas and is intended to prevent excessive exposures from a small contaminated area that is within a larger area that meets the basic Authorized Limits. Thus, it is intended for use in areas where the residual radioactive material concentrations are not uniform. Also, the above hotspot criterion was derived conservatively, assuming the Authorized Limits were based on a dose constraint of 25 mrem/y and selected to ensure unlikely exposure conditions would not cause the primary dose limit (100 mrem/y) to be exceeded. In the case of the HRNM units, the Historical Site Assessment concluded that the concentrations would be at essentially background levels. There was no indication of hot spots being present. Thus, since the residual radioactive material would be expected to be reasonably uniform, there is no reason to establish a hot spot criterion.

6.0 Comparisons with Soil Concentration Data

The previous section discussed the Authorized Limits developed for soil at the HRNM. This section compares the Authorized Limits with measured soil concentration data from various locations on the HRNM.

Table 6.1 lists the maximum measured soil concentrations (including background) for soil for the Hanford North Slope (the Wahluke and Saddle Mountain units combined), the McGee Ranch/Riverlands Unit, and the ALE Unit, as reported by Fritz et al. (2003). The columns in this table list the reference radionuclides, Authorized Limits reported in Section 5, measured data, and results of the sum of fractions rule for each mixture. As shown in Table 6.1, the sum of fractions evaluation indicates that none of the mixtures are greater than 1 (i.e., the radionuclide mixtures would not be expected to produce radiation doses in excess of 100 mrem/y). Even the maximum concentrations reported for the Riverlands/McGee Unit, including background, result in a sum of fractions result that is only about 3% of the composite Authorized Limit for the mixture. This indicates that potential future doses to a person matching the characteristics of the unlikely Agricultural Resident would be on the order of 2 to 3 mrem/y. Similar calculations indicate that doses to the more anticipated Recreational Visitor would be much lower, on the order of 0.3 mrem/y.

It is noted from the data in Tables 6.1 that the measured results are both close to the detection limit and close to measured background values. For several of these measurements, the values may be statistically “indistinguishable from background,” which indicates that it may be difficult to determine if historical releases from the Hanford Site have any influence on the environmental contamination levels encountered for specific locations. This is further confirmation that the Authorized Limits would protect future populations at well below a dose limit of 100 mrem/y.

Table 6.1. Comparison of Hanford Reach National Monument Authorized Limits with Maximum Measured Soil Concentration Data – Application of the Sum-of-Fractions Rule for Mixtures

Radionuclide	Authorized Limit	North Slope Maximum values (1990-2001) ^(a)		McGee/Riverlands Maximum values (1992) ^(b)		ALE Maximum values (1990-2001) ^(a)	
	pCi/g	pCi/g	Ratio	pCi/g	Ratio	pCi/g	Ratio
²⁴¹ Am	420	N/A	--	N/A	--	N/A	--
⁶⁰ Co	11	1.20E-02	0.0011	1.90E-02	0.0017	3.00E-03	0.0003
¹³⁴ Cs	20	N/A	--	N/A	--	N/A	--
¹³⁷ Cs	46	9.50E-01	0.0209	6.20E-01	0.0209	4.20E-01	0.0092
¹⁵² Eu	24	N/A	--	1.40E-01	0.0057	N/A	--
^{239/240} Pu	480	3.00E-02	0.0001	9.80E-03	2.0E-05	1.40E-02	2.9E-5
⁹⁰ Sr	88	2.00E-01	0.0023	2.50E-02	0.0003	1.40E-01	0.0016
²³⁴ U	2400	8.93E-01	0.0004	1.30E+00	0.0005	7.47E-01	0.0003
²³⁵ U	190	1.68E-01	0.0009	4.70E-02	0.0002	1.93E-01	0.0010
²³⁸ U	770	8.78E-01	0.0011	1.20E+00	0.0016	1.01E+00	0.0013
Sum-of-fractions			0.0268		0.0309		0.0137

(a) From Fritz et al. (2003), Table B.1.
(b) From Fritz et al. (2003), Table 4.9.

7.0 Discussion of Results

The following paragraphs discuss the Authorized Limits derived for the HRNM, considering limited comparisons against other studies and methods and general observations about the modeling analysis that was conducted.

7.1 Comparisons with Other Studies and Methods

The purpose of this report was to provide radiation dose modeling and technical analyses supporting the derivation of Authorized Limits for the HRNM. The approach was to use the RESRAD (Yu et al. 2001) computer program, with user-supplied parameters and assumptions specific to the HRNM lands. When evaluating the results of modeling analyses, it is often useful to follow a process called “multiple lines of reasoning.” This process is simply to produce independent results by alternative methods (models and data) and compare the results. The comparisons can help the analyst determine if the results are consistent across methods and assumptions, and if not, what accounts for the differences. The process can help build confidence that the modeling results are an adequate representation of the situation. In this case, evaluating “multiple lines of reasoning” will help determine if the Authorized Limits are protective of 100 mrem/y, or if they are overly conservative.

Often it is difficult to find fully independent alternative methods, and so only limited comparisons are possible. For this study, two alternative methods for the derivation of radiation doses from soil concentrations have been identified. These are the methods supporting the U.S. Nuclear Regulatory Commission/U.S. Environmental Protection Agency (NRC/EPA) Memorandum of Understanding (MOU) regarding the NRC decommissioning program (Whitman and Meserve 2002) for surface soil contamination, and Report No. 129 by the National Council on Radiation Protection and Measurements (NCRP 1999) on *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies*. The NRC/EPA MOU report provides values for common radionuclides for soil contamination levels that would trigger consultations between NRC and EPA about residual contamination following decommissioning of NRC licensed facilities, which represent a lifetime risk of about 10^{-4} for a residential scenario as calculated using the EPA Soil Screening Guidance methodology (EPA 2000)—approximately equivalent to the NRC’s decommissioning standard of 25 mrem/y. For comparison with the Authorized Limits for the HRNM these NRC/EPA MOU values were multiplied by a factor of four. These modified NRC/EPA MOU values are approximately equivalent to a 100 mrem/y dose. The NCRP report supplies several alternatives; that which most closely compares with the HRNM situation is for what NCRP defines as “rural, sparsely vegetated” (RS) conditions. A summary of the comparison of the Authorized Limits derived for the HRNM and similar limits (pCi/g at 100 mrem/y) from these two studies is provided in Table 7.1. This table also provides the ratio of the HRNM Authorized Limits to those produced for each alternative study. The overall results of these comparisons are that they are remarkably close, given different models, scenarios, and assumptions, and that the HRNM Authorized Limits would be protective of 100 mrem/y.

As shown in Table 7.1, the Authorized Limits derived for the HRNM are within about a factor of three of those derived for the alternative studies, with ratios both greater than one and less than one, depending on the radionuclide. The primary differences that would account for these results are lower air

Table 7.1. Comparison of HRNM Authorized Limits with Alternative Models/Methods

Radionuclide	HRNM Agricultural Resident	EPA/NRC Trigger Values (Modified for 100 mrem/y)		NCRP No. 129	
	Authorized Limit, pCi/g	pCi/g	Ratio HRNM to EPA/NRC	pCi/g at 100 mrem/y	Ratio HRNM to NCRP
²⁴¹ Am	420	748	0.6	142	3.0
⁶⁰ Co	11	16	0.7	7.9	1.4
¹³⁴ Cs	20	64	0.3	17	1.2
¹³⁷ Cs	46	24	1.9	36	1.3
¹⁵² Eu	24	16	1.5	22	1.1
²³⁹ Pu	480	1040	0.5	130	3.7
²⁴⁰ Pu	480	1040	0.5	120	4.0
⁹⁰ Sr	88	92	1.0	7.9	11
²³⁴ U	2400	1600	1.5	370	6.5
²³⁵ U	190	80	2.4	61	3.1
²³⁸ U	770	296	2.6	270	2.9

concentrations for the inhalation pathway for portions of the year spent outdoors based on the Hanford-specific resuspension measurements, and lower ingestion of farm crops because the agricultural conditions at Hanford are generally less favorable than those assumed for the generic screening calculations of the other studies.

7.2 Background

The Authorized Limits derived in this document are to be applied to radionuclide concentrations above those occurring in natural and global anthropomorphic background. Background concentrations of radionuclides in soils are provided in DOE (1995; 1996). According to interim Washington State guidance, the 90th percentile background radionuclide concentrations should be used when subtracting the background contribution from measurements made at a site. Soil background concentration subtraction should be performed on a radionuclide-specific basis (WDOH 1997).

7.3 General Observations

In conducting this analysis, attempts were made to “realistically,” yet conservatively, model the end-use conditions of the HRNM, given the uncertainty associated with the activities conducted by individuals in the critical groups. However, it is noted that conservative assumptions were used in several cases to assure that the resulting Authorized Limits would be protective of 100 mrem/y. Some of the more important assumptions contributing to the conservative nature of the results include the following:

- Assuming uniform distributions of radioactive contamination to a depth of 15 cm. Because for most areas of the HRNM atmospheric deposition was the primary origin of the residual radioactive contamination, and because it is unlikely that uniform mixing could occur to this depth, this

assumption would cause a conservative treatment of the external exposure pathway and contribute to the development of conservative Authorized Limits for photon-emitting radionuclides.

- Inclusion of relatively high ingestion rates for game for the Recreational Visitor (e.g., 22 kg/y) and farm crops for the Agricultural Resident (e.g., nearly 120 kg/y of local produce and 110 L/year of local milk) scenarios contributed to the conservative treatment of the ingestion pathway and was a contributor to the determination of the HRNM Authorized Limits for several radionuclides.

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Appendix A

RESRAD 6.21 Output for the Recreational Visitor Scenario

Appendix A

RESRAD 6.21 Output for the Avid Recreation Scenario

RESRAD, Version 6.21 T½ Limit = 0.5 year 02/08/2004 17:55 Page 1
Summary : RESRAD HRNM Parameters Recreational Scenario - ALE
File : RECREAT_HRNM_Ale.TEM

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Dose Conversion Factor (and Related) Parameter Summary
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2 (1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2 (2)
B-1	Co-60	2.190E-04	2.190E-04	DCF2 (3)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2 (4)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2 (5)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2 (6)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2 (8)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2 (9)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2 (10)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2 (11)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2 (12)
B-1	Pu-240	4.290E-01	4.290E-01	DCF2 (13)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2 (14)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2 (15)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2 (16)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2 (17)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2 (18)
B-1	Th-230	3.260E-01	3.260E-01	DCF2 (19)
B-1	Th-232	1.640E+00	1.640E+00	DCF2 (20)
B-1	U-233	1.350E-01	1.350E-01	DCF2 (21)
B-1	U-234	1.320E-01	1.320E-01	DCF2 (22)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2 (23)
B-1	U-236	1.250E-01	1.250E-01	DCF2 (24)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2 (25)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3 (1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3 (2)
D-1	Co-60	2.690E-05	2.690E-05	DCF3 (3)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3 (4)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3 (5)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3 (6)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3 (8)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3 (9)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3 (10)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3 (11)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3 (12)
D-1	Pu-240	3.540E-03	3.540E-03	DCF3 (13)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3 (14)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3 (15)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3 (16)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3 (17)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3 (18)
D-1	Th-230	5.480E-04	5.480E-04	DCF3 (19)
D-1	Th-232	2.730E-03	2.730E-03	DCF3 (20)
D-1	U-233	2.890E-04	2.890E-04	DCF3 (21)
D-1	U-234	2.830E-04	2.830E-04	DCF3 (22)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3 (23)
D-1	U-236	2.690E-04	2.690E-04	DCF3 (24)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-1	U-238+D	2.690E-04	2.690E-04	DCF3 (25)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(3,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(3,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(3,3)
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(4,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(4,3)
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(5,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,3)
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(9,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(9,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(9,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(10,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(10,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(10,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(11,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(11,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(11,3)
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(12,3)
D-34	Pu-240 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Pu-240 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Pu-240 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(13,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(14,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(15,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(15,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(15,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(16,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(16,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(16,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(17,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(17,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(18,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(18,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(18,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(19,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(19,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(19,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(20,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(20,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(21,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(21,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(21,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(22,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(22,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(22,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(23,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(23,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(23,3)
D-34				
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(24,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(24,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(24,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(25,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(25,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(25,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5				
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(3,2)
D-5				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(4,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(5,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(8,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(9,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(10,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(10,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(11,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(12,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(12,2)
D-5				
D-5	Pu-240 , fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Pu-240 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(13,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(14,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(14,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(15,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(15,2)
D-5				
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(16,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(16,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(17,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(17,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC (18,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (18,2)
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC (19,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (19,2)
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC (20,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (20,2)
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC (21,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (21,2)
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC (22,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (22,2)
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC (23,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (23,2)
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC (24,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (24,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC (25,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (25,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.880E+08	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	9.000E+03	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T (2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T (3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T (4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T (5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T (6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T (7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T (8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T (9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g) : Am-241	1.000E+02	0.000E+00	---	S1 (2)
R012	Initial principal radionuclide (pCi/g) : Co-60	1.000E+02	0.000E+00	---	S1 (3)
R012	Initial principal radionuclide (pCi/g) : Cs-134	1.000E+02	0.000E+00	---	S1 (4)
R012	Initial principal radionuclide (pCi/g) : Cs-137	1.000E+02	0.000E+00	---	S1 (5)
R012	Initial principal radionuclide (pCi/g) : Eu-152	1.000E+02	0.000E+00	---	S1 (6)
R012	Initial principal radionuclide (pCi/g) : Pu-239	1.000E+02	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g) : Pu-240	1.000E+02	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g) : Sr-90	1.000E+02	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g) : U-234	1.000E+02	0.000E+00	---	S1(22)
R012	Initial principal radionuclide (pCi/g) : U-235	1.000E+02	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g) : U-238	1.000E+02	0.000E+00	---	S1(25)
R012	Concentration in groundwater (pCi/L) : Am-241	not used	0.000E+00	---	W1 (2)
R012	Concentration in groundwater (pCi/L) : Co-60	not used	0.000E+00	---	W1 (3)
R012	Concentration in groundwater (pCi/L) : Cs-134	not used	0.000E+00	---	W1 (4)
R012	Concentration in groundwater (pCi/L) : Cs-137	not used	0.000E+00	---	W1 (5)
R012	Concentration in groundwater (pCi/L) : Eu-152	not used	0.000E+00	---	W1 (6)
R012	Concentration in groundwater (pCi/L) : Pu-239	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L) : Pu-240	not used	0.000E+00	---	W1(13)
R012	Concentration in groundwater (pCi/L) : Sr-90	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L) : U-234	not used	0.000E+00	---	W1(22)
R012	Concentration in groundwater (pCi/L) : U-235	not used	0.000E+00	---	W1(23)
R012	Concentration in groundwater (pCi/L) : U-238	not used	0.000E+00	---	W1(25)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	V CZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.500E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Precipitation (m/yr)	1.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	3.000E-02	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.100E+09	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.530E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.250E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.050E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	4.600E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.200E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	2.500E+02	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.500E+03	2.000E+01	---	DCNUC(2)
R016	Unsat. zone 1 (cm**3/g)	2.000E+02	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.880E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUC(3)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.819E-05	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	2.000E+03	1.000E+03	---	DCNUC(4)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.910E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.000E+03	1.000E+03	---	DCNUCC (5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCU (5,1)
R016	Saturated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCS (5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.910E-05	ALEACH (5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (5)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (6)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (6,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.055E-05	ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (6)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	5.000E+03	2.000E+03	---	DCNUCC (12)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCU (12,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCS (12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.164E-05	ALEACH (12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (12)
R016	Distribution coefficients for Pu-240				
R016	Contaminated zone (cm**3/g)	5.000E+03	2.000E+03	---	DCNUCC (13)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCU (13,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCS (13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.164E-05	ALEACH (13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (13)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.800E+02	3.000E+01	---	DCNUCC (16)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	3.000E+01	---	DCNUCU (16,1)
R016	Saturated zone (cm**3/g)	2.500E+01	3.000E+01	---	DCNUCS (16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.231E-04	ALEACH (16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (16)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC (22)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU (22,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS (22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.168E-03	ALEACH (22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (22)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC (23)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU (23,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS (23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.168E-03	ALEACH (23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (23)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.168E-03	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.892E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.055E-05	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.260E-04	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.161E-03	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.813E-04	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.299E-04	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (15)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (15,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.299E-04	ALEACH (15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (15)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (17)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (17,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.700E-07	ALEACH (17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (17)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (18)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (18,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.700E-07	ALEACH (18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (18)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (19)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (19,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.700E-07	ALEACH (19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (19)
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (20)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (20,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.700E-07	ALEACH (20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (20)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (21)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (21,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.161E-03	ALEACH (21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (21)
R016	Distribution coefficients for daughter U-236				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (24)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (24,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.161E-03	ALEACH (24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (24)
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	---	INHALR

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Mass loading for inhalation (g/m**3)	2.730E-05	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	3.200E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE (1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE (2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE (3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE (4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE (5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE (6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE (7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE (8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE (9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE (10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE (11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE (12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA (1)
R017	Ring 2	not used	2.732E-01	---	FRACA (2)
R017	Ring 3	not used	0.000E+00	---	FRACA (3)
R017	Ring 4	not used	0.000E+00	---	FRACA (4)
R017	Ring 5	not used	0.000E+00	---	FRACA (5)
R017	Ring 6	not used	0.000E+00	---	FRACA (6)
R017	Ring 7	not used	0.000E+00	---	FRACA (7)
R017	Ring 8	not used	0.000E+00	---	FRACA (8)
R017	Ring 9	not used	0.000E+00	---	FRACA (9)
R017	Ring 10	not used	0.000E+00	---	FRACA (10)
R017	Ring 11	not used	0.000E+00	---	FRACA (11)
R017	Ring 12	not used	0.000E+00	---	FRACA (12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET (1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET (2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET (3)
R018	Meat and poultry consumption (kg/yr)	2.160E+01	6.300E+01	---	DIET (4)
R018	Fish consumption (kg/yr)	1.970E+01	5.400E+00	---	DIET (5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET (6)
R018	Soil ingestion rate (g/yr)	2.190E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	1.000E+00	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV (1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV (2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV (3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE (1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE (2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE (3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV (1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV (2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV (3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY (1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY (2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY (3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET (1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET (2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET (3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T (1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T (2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T (3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T (4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T (5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T (6)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g
Area:***** square meters	Am-241 1.000E+02
Thickness: 0.15 meters	Co-60 1.000E+02
Cover Depth: 0.00 meters	Cs-134 1.000E+02
	Cs-137 1.000E+02
	Eu-152 1.000E+02
	Pu-239 1.000E+02
	Pu-240 1.000E+02
	Sr-90 1.000E+02
	U-234 1.000E+02
	U-235 1.000E+02
	U-238 1.000E+02

Total Dose TDOSE(t), mrem/yr
 Basic Radiation Dose Limit = 1.000E+02 mrem/yr
 Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.262E+02	1.113E+02	8.960E+01	5.338E+01	2.478E+01	5.231E+00	0.000E+00	0.000E+00
M(t):	1.262E+00	1.113E+00	8.960E-01	5.338E-01	2.478E-01	5.231E-02	0.000E+00	0.000E+00

Maximum TDOSE(t): 1.262E+02 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.397E-01	0.0011	3.443E-01	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-01	0.0016	0.000E+00	0.0000	2.540E+00	0.0201
Co-60	4.168E+01	0.3302	1.593E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.529E+00	0.0121	0.000E+00	0.0000	1.761E-02	0.0001
Cs-134	2.316E+01	0.1835	3.052E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.839E+00	0.0304	0.000E+00	0.0000	4.349E-02	0.0003
Cs-137	9.755E+00	0.0773	2.447E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.048E+00	0.0241	0.000E+00	0.0000	3.452E-02	0.0003
Eu-152	1.919E+01	0.1520	1.671E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-02	0.0001	0.000E+00	0.0000	4.410E-03	0.0000
Pu-239	9.141E-04	0.0000	3.329E-01	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	3.905E-01	0.0031	0.000E+00	0.0000	2.473E+00	0.0196
Pu-240	4.696E-04	0.0000	3.329E-01	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	3.905E-01	0.0031	0.000E+00	0.0000	2.472E+00	0.0196
Sr-90	7.378E-02	0.0006	1.004E-03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E+01	0.0805	0.000E+00	0.0000	1.056E-01	0.0008
U-234	1.272E-03	0.0000	1.020E-01	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-01	0.0009	0.000E+00	0.0000	1.969E-01	0.0016
U-235	2.330E+00	0.0185	9.507E-02	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-01	0.0008	0.000E+00	0.0000	1.858E-01	0.0015
U-238	4.382E-01	0.0035	9.120E-02	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.039E-01	0.0008	0.000E+00	0.0000	1.871E-01	0.0015
Total	9.677E+01	0.7666	1.300E+00	0.0103	0.000E+00	0.0000	0.000E+00	0.0000	1.989E+01	0.1576	0.000E+00	0.0000	8.261E+00	0.0654

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E+00	0.0255
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.322E+01	0.3425
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.704E+01	0.2142
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.284E+01	0.1017
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.921E+01	0.1522
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.197E+00	0.0253
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.196E+00	0.0253
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.035E+01	0.0820
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.094E-01	0.0032
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.715E+00	0.0215
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.204E-01	0.0065
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.262E+02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.394E-01	0.0013	3.414E-01	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-01	0.0018	0.000E+00	0.0000	2.519E+00	0.0226
Co-60	3.646E+01	0.3277	1.387E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E+00	0.0120	0.000E+00	0.0000	1.533E-02	0.0001
Cs-134	1.652E+01	0.1484	2.166E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.725E+00	0.0245	0.000E+00	0.0000	3.086E-02	0.0003
Cs-137	9.517E+00	0.0855	2.375E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.959E+00	0.0266	0.000E+00	0.0000	3.351E-02	0.0003
Eu-152	1.818E+01	0.1634	1.576E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-02	0.0001	0.000E+00	0.0000	4.159E-03	0.0000
Pu-239	9.134E-04	0.0000	3.307E-01	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	3.879E-01	0.0035	0.000E+00	0.0000	2.456E+00	0.0221
Pu-240	4.695E-04	0.0000	3.306E-01	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	3.878E-01	0.0035	0.000E+00	0.0000	2.456E+00	0.0221
Sr-90	7.195E-02	0.0006	9.739E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.859E+00	0.0886	0.000E+00	0.0000	1.024E-01	0.0009
U-234	1.262E-03	0.0000	1.005E-01	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-01	0.0010	0.000E+00	0.0000	1.940E-01	0.0017
U-235	2.309E+00	0.0208	9.369E-02	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-01	0.0009	0.000E+00	0.0000	1.832E-01	0.0016
U-238	4.340E-01	0.0039	8.985E-02	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-01	0.0009	0.000E+00	0.0000	1.844E-01	0.0017
===== Total	8.364E+01	0.7516	1.288E+00	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	1.818E+01	0.1633	0.000E+00	0.0000	8.178E+00	0.0735

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.199E+00	0.0287
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.781E+01	0.3398
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.927E+01	0.1732
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E+01	0.1124
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E+01	0.1636
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.175E+00	0.0285
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.174E+00	0.0285
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E+01	0.0902
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.034E-01	0.0036
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.690E+00	0.0242
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.105E-01	0.0073
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.113E+02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.390E-01	0.0016	3.357E-01	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	1.956E-01	0.0022	0.000E+00	0.0000	2.477E+00	0.0276
Co-60	2.791E+01	0.3115	1.052E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E+00	0.0113	0.000E+00	0.0000	1.163E-02	0.0001
Cs-134	8.404E+00	0.0938	1.091E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E+00	0.0153	0.000E+00	0.0000	1.554E-02	0.0002
Cs-137	9.056E+00	0.1011	2.237E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.787E+00	0.0311	0.000E+00	0.0000	3.156E-02	0.0004
Eu-152	1.632E+01	0.1822	1.401E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.206E-02	0.0001	0.000E+00	0.0000	3.697E-03	0.0000
Pu-239	9.120E-04	0.0000	3.262E-01	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	3.826E-01	0.0043	0.000E+00	0.0000	2.423E+00	0.0270
Pu-240	4.694E-04	0.0000	3.261E-01	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	3.825E-01	0.0043	0.000E+00	0.0000	2.422E+00	0.0270
Sr-90	6.841E-02	0.0008	9.155E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.268E+00	0.1034	0.000E+00	0.0000	9.624E-02	0.0011
U-234	1.241E-03	0.0000	9.756E-02	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	1.045E-01	0.0012	0.000E+00	0.0000	1.883E-01	0.0021
U-235	2.268E+00	0.0253	9.099E-02	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.035E-01	0.0012	0.000E+00	0.0000	1.782E-01	0.0020
U-238	4.256E-01	0.0047	8.720E-02	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	9.932E-02	0.0011	0.000E+00	0.0000	1.789E-01	0.0020
===== Total	6.459E+01	0.7209	1.265E+00	0.0141	0.000E+00	0.0000	0.000E+00	0.0000	1.572E+01	0.1754	0.000E+00	0.0000	8.026E+00	0.0896

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.147E+00	0.0351
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.893E+01	0.3229
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.792E+00	0.1093
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.187E+01	0.1325
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.634E+01	0.1823
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.132E+00	0.0350
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E+00	0.0349
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.434E+00	0.1053
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.915E-01	0.0044
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E+00	0.0295
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.910E-01	0.0088
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.960E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.374E-01	0.0026	3.160E-01	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	1.842E-01	0.0034	0.000E+00	0.0000	2.332E+00	0.0437
Co-60	1.094E+01	0.2049	3.987E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.828E-01	0.0072	0.000E+00	0.0000	4.408E-03	0.0001
Cs-134	7.886E-01	0.0148	9.874E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-01	0.0023	0.000E+00	0.0000	1.407E-03	0.0000
Cs-137	7.606E+00	0.1425	1.812E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.257E+00	0.0423	0.000E+00	0.0000	2.556E-02	0.0005
Eu-152	1.117E+01	0.2093	9.264E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.980E-03	0.0001	0.000E+00	0.0000	2.445E-03	0.0000
Pu-239	9.065E-04	0.0000	3.105E-01	0.0058	0.000E+00	0.0000	0.000E+00	0.0000	3.642E-01	0.0068	0.000E+00	0.0000	2.306E+00	0.0432
Pu-240	4.687E-04	0.0000	3.103E-01	0.0058	0.000E+00	0.0000	0.000E+00	0.0000	3.639E-01	0.0068	0.000E+00	0.0000	2.304E+00	0.0432
Sr-90	5.730E-02	0.0011	7.363E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.454E+00	0.1396	0.000E+00	0.0000	7.740E-02	0.0014
U-234	1.176E-03	0.0000	8.774E-02	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	9.397E-02	0.0018	0.000E+00	0.0000	1.693E-01	0.0032
U-235	2.129E+00	0.0399	8.210E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	1.025E-01	0.0019	0.000E+00	0.0000	1.615E-01	0.0030
U-238	3.971E-01	0.0074	7.842E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	8.932E-02	0.0017	0.000E+00	0.0000	1.609E-01	0.0030
Total	3.323E+01	0.6224	1.186E+00	0.0222	0.000E+00	0.0000	0.000E+00	0.0000	1.142E+01	0.2140	0.000E+00	0.0000	7.545E+00	0.1413

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.969E+00	0.0556
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E+01	0.2121
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.142E-01	0.0171
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.889E+00	0.1852
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E+01	0.2095
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.982E+00	0.0559
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E+00	0.0558
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.590E+00	0.1422
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.522E-01	0.0066
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.475E+00	0.0464
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.258E-01	0.0136
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.338E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.328E-01	0.0054	2.620E-01	0.0106	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-01	0.0062	0.000E+00	0.0000	1.933E+00	0.0780
Co-60	7.443E-01	0.0300	2.459E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.361E-02	0.0010	0.000E+00	0.0000	2.719E-04	0.0000
Cs-134	9.048E-04	0.0000	1.017E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-04	0.0000	0.000E+00	0.0000	1.449E-06	0.0000
Cs-137	4.576E+00	0.1846	9.772E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E+00	0.0491	0.000E+00	0.0000	1.379E-02	0.0006
Eu-152	3.747E+00	0.1512	2.801E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.413E-03	0.0001	0.000E+00	0.0000	7.393E-04	0.0000
Pu-239	8.858E-04	0.0000	2.658E-01	0.0107	0.000E+00	0.0000	0.000E+00	0.0000	3.118E-01	0.0126	0.000E+00	0.0000	1.974E+00	0.0796
Pu-240	4.666E-04	0.0000	2.651E-01	0.0107	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-01	0.0126	0.000E+00	0.0000	1.969E+00	0.0795
Sr-90	3.427E-02	0.0014	3.893E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.942E+00	0.1591	0.000E+00	0.0000	4.093E-02	0.0017
U-234	1.034E-03	0.0000	6.387E-02	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	6.838E-02	0.0028	0.000E+00	0.0000	1.232E-01	0.0050
U-235	1.764E+00	0.0712	6.077E-02	0.0025	0.000E+00	0.0000	0.000E+00	0.0000	9.600E-02	0.0039	0.000E+00	0.0000	1.212E-01	0.0049
U-238	3.229E-01	0.0130	5.706E-02	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	6.499E-02	0.0026	0.000E+00	0.0000	1.171E-01	0.0047
===== Total	1.132E+01	0.4569	9.750E-01	0.0393	0.000E+00	0.0000	0.000E+00	0.0000	6.191E+00	0.2498	0.000E+00	0.0000	6.293E+00	0.2539

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.480E+00	0.1001
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.682E-01	0.0310
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.034E-03	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.807E+00	0.2343
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.750E+00	0.1513
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.552E+00	0.1030
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.546E+00	0.1027
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.018E+00	0.1621
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.565E-01	0.0104
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.042E+00	0.0824
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.621E-01	0.0227
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.478E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.103E-01	0.0211	9.672E-02	0.0185	0.000E+00	0.0000	0.000E+00	0.0000	5.647E-02	0.0108	0.000E+00	0.0000	7.137E-01	0.1365
Co-60	4.726E-05	0.0000	1.020E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.809E-07	0.0000	0.000E+00	0.0000	1.127E-08	0.0000
Cs-134	3.595E-14	0.0000	2.538E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.198E-15	0.0000	0.000E+00	0.0000	3.617E-17	0.0000
Cs-137	6.004E-01	0.1148	8.015E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-01	0.0191	0.000E+00	0.0000	1.131E-03	0.0002
Eu-152	6.372E-02	0.0122	3.031E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.613E-05	0.0000	0.000E+00	0.0000	8.000E-06	0.0000
Pu-239	6.821E-04	0.0001	1.098E-01	0.0210	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-01	0.0246	0.000E+00	0.0000	8.154E-01	0.1559
Pu-240	4.402E-04	0.0001	1.089E-01	0.0208	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-01	0.0244	0.000E+00	0.0000	8.091E-01	0.1547
Sr-90	4.524E-03	0.0009	2.979E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.022E-01	0.0578	0.000E+00	0.0000	3.132E-03	0.0006
U-234	7.513E-04	0.0001	1.497E-02	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	1.604E-02	0.0031	0.000E+00	0.0000	2.889E-02	0.0055
U-235	7.385E-01	0.1412	1.604E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	4.680E-02	0.0089	0.000E+00	0.0000	3.384E-02	0.0065
U-238	1.252E-01	0.0239	1.335E-02	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	1.521E-02	0.0029	0.000E+00	0.0000	2.738E-02	0.0052
Total	1.645E+00	0.3144	3.598E-01	0.0688	0.000E+00	0.0000	0.000E+00	0.0000	7.935E-01	0.1517	0.000E+00	0.0000	2.433E+00	0.4651

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.772E-01	0.1868
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.825E-05	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.919E-14	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.016E-01	0.1341
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.376E-02	0.0122
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E+00	0.2016
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.046E+00	0.2000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.099E-01	0.0593
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.065E-02	0.0116
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.352E-01	0.1597
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-01	0.0346
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.231E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Am-241	Am-241	1.000E+00		3.225E-02	3.199E-02	3.147E-02	2.969E-02	2.480E-02	9.771E-03	0.000E+00	0.000E+00
Am-241	Np-237	1.000E+00		2.064E-08	6.471E-08	1.518E-07	4.389E-07	1.111E-06	1.708E-06	0.000E+00	0.000E+00
Am-241	U-233	1.000E+00		1.125E-15	7.387E-15	3.718E-14	3.085E-13	2.173E-12	9.177E-12	0.000E+00	0.000E+00
Am-241	Th-229	1.000E+00		5.609E-19	8.213E-18	9.415E-17	2.403E-15	5.270E-14	1.014E-12	0.000E+00	0.000E+00
Am-241	\$DSR(j)			3.225E-02	3.199E-02	3.147E-02	2.969E-02	2.480E-02	9.772E-03	0.000E+00	0.000E+00
Co-60	Co-60	1.000E+00		4.322E-01	3.781E-01	2.893E-01	1.132E-01	7.682E-03	4.825E-07	0.000E+00	0.000E+00
Cs-134	Cs-134	1.000E+00		2.704E-01	1.927E-01	9.792E-02	9.142E-03	1.034E-05	3.919E-16	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00		1.284E-01	1.251E-01	1.187E-01	9.889E-02	5.807E-02	7.016E-03	0.000E+00	0.000E+00
Eu-152	Eu-152	7.208E-01		1.385E-01	1.312E-01	1.178E-01	8.062E-02	2.703E-02	4.596E-04	0.000E+00	0.000E+00
Eu-152	Eu-152	2.792E-01		5.363E-02	5.082E-02	4.561E-02	3.123E-02	1.047E-02	1.780E-04	0.000E+00	0.000E+00
Eu-152	Gd-152	2.792E-01		5.876E-18	1.713E-17	3.750E-17	9.029E-17	1.460E-16	7.531E-17	0.000E+00	0.000E+00
Eu-152	\$DSR(j)			5.363E-02	5.082E-02	4.561E-02	3.123E-02	1.047E-02	1.780E-04	0.000E+00	0.000E+00
Pu-239	Pu-239	1.000E+00		3.197E-02	3.175E-02	3.132E-02	2.982E-02	2.552E-02	1.055E-02	0.000E+00	0.000E+00
Pu-239	U-235	1.000E+00		1.334E-11	3.989E-11	9.208E-11	2.653E-10	6.828E-10	1.210E-09	0.000E+00	0.000E+00
Pu-239	Pa-231	1.000E+00		2.286E-15	1.755E-14	9.514E-14	8.120E-13	5.565E-12	2.059E-11	0.000E+00	0.000E+00
Pu-239	Ac-227	1.000E+00		1.075E-17	1.261E-16	1.209E-15	2.558E-14	4.338E-13	4.142E-12	0.000E+00	0.000E+00
Pu-239	\$DSR(j)			3.197E-02	3.175E-02	3.132E-02	2.982E-02	2.552E-02	1.055E-02	0.000E+00	0.000E+00
Pu-240	Pu-240	1.000E+00		3.196E-02	3.174E-02	3.131E-02	2.979E-02	2.546E-02	1.046E-02	0.000E+00	0.000E+00
Pu-240	U-236	1.000E+00		5.647E-11	1.704E-10	3.935E-10	1.122E-09	2.759E-09	3.613E-09	0.000E+00	0.000E+00
Pu-240	Th-232	1.000E+00		8.730E-21	5.974E-20	3.089E-19	2.612E-18	1.868E-17	8.158E-17	0.000E+00	0.000E+00
Pu-240	Ra-228	1.000E+00		1.424E-21	2.127E-20	2.365E-19	5.133E-18	7.618E-17	6.938E-16	0.000E+00	0.000E+00
Pu-240	Th-228	1.000E+00		1.412E-22	4.020E-21	8.493E-20	3.802E-18	8.467E-17	9.154E-16	0.000E+00	0.000E+00
Pu-240	\$DSR(j)			3.196E-02	3.174E-02	3.131E-02	2.979E-02	2.546E-02	1.046E-02	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00		1.035E-01	1.003E-01	9.434E-02	7.590E-02	4.018E-02	3.099E-03	0.000E+00	0.000E+00
U-234	U-234	1.000E+00		4.094E-03	4.034E-03	3.915E-03	3.521E-03	2.563E-03	6.018E-04	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		3.204E-08	9.402E-08	2.138E-07	5.925E-07	1.362E-06	1.441E-06	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		2.215E-10	1.561E-09	8.206E-09	7.074E-08	5.272E-07	2.891E-06	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		7.346E-13	1.045E-11	1.129E-10	2.572E-09	4.392E-08	3.593E-07	0.000E+00	0.000E+00
U-234	\$DSR(j)			4.094E-03	4.034E-03	3.915E-03	3.522E-03	2.565E-03	6.065E-04	0.000E+00	0.000E+00
U-235	U-235	1.000E+00		2.714E-02	2.687E-02	2.635E-02	2.459E-02	2.003E-02	7.901E-03	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		7.467E-06	2.375E-05	5.549E-05	1.553E-04	3.543E-04	3.581E-04	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		3.974E-08	2.183E-07	9.715E-07	6.982E-06	3.866E-05	9.213E-05	0.000E+00	0.000E+00
U-235	\$DSR(j)			2.715E-02	2.690E-02	2.641E-02	2.475E-02	2.042E-02	8.352E-03	0.000E+00	0.000E+00

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-238	U-238	1.000E+00	8.204E-03	8.105E-03	7.910E-03	7.258E-03	5.621E-03	1.812E-03	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	5.789E-09	1.714E-08	3.883E-08	1.048E-07	2.216E-07	1.715E-07	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	3.061E-14	2.082E-13	1.066E-12	8.708E-12	5.646E-11	1.775E-10	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	1.559E-16	2.355E-15	2.732E-14	6.932E-13	1.462E-11	2.417E-10	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	4.154E-19	1.241E-17	2.896E-16	1.937E-14	9.595E-13	2.553E-11	0.000E+00	0.000E+00
U-238	\$DSR(j)		8.204E-03	8.105E-03	7.910E-03	7.258E-03	5.621E-03	1.812E-03	0.000E+00	0.000E+00

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 \$ is used to indicate summation; the Greek sigma is not included in this font.
 The DSR includes contributions from associated (half-life <= 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 1.000E+02 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Am-241	3.101E+03	3.126E+03	3.177E+03	3.368E+03	4.032E+03	1.023E+04	*3.430E+12	*3.430E+12
Co-60	2.313E+02	2.645E+02	3.457E+02	8.831E+02	1.302E+04	2.073E+08	*1.131E+15	*1.131E+15
Cs-134	3.698E+02	5.188E+02	1.021E+03	1.094E+04	9.669E+06	*1.294E+15	*1.294E+15	*1.294E+15
Cs-137	7.790E+02	7.994E+02	8.421E+02	1.011E+03	1.722E+03	1.425E+04	*8.701E+13	*8.701E+13
Eu-152	5.206E+02	5.494E+02	6.121E+02	8.941E+02	2.667E+03	1.568E+05	*1.765E+14	*1.765E+14
Pu-239	3.128E+03	3.149E+03	3.193E+03	3.354E+03	3.918E+03	9.482E+03	*6.212E+10	*6.212E+10
Pu-240	3.129E+03	3.150E+03	3.194E+03	3.357E+03	3.928E+03	9.558E+03	*2.277E+11	*2.277E+11
Sr-90	9.665E+02	9.966E+02	1.060E+03	1.318E+03	2.489E+03	3.227E+04	*1.365E+14	*1.365E+14
U-234	2.443E+04	2.479E+04	2.554E+04	2.839E+04	3.899E+04	1.649E+05	*6.245E+09	*6.245E+09
U-235	3.684E+03	3.718E+03	3.787E+03	4.041E+03	4.896E+03	1.197E+04	*2.160E+06	*2.160E+06
U-238	1.219E+04	1.234E+04	1.264E+04	1.378E+04	1.779E+04	5.520E+04	*3.360E+05	*3.360E+05

*At specific activity limit

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

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.000E+02	0.000E+00	3.225E-02	3.101E+03	3.225E-02	3.101E+03
Co-60	1.000E+02	0.000E+00	4.322E-01	2.313E+02	4.322E-01	2.313E+02
Cs-134	1.000E+02	0.000E+00	2.704E-01	3.698E+02	2.704E-01	3.698E+02
Cs-137	1.000E+02	0.000E+00	1.284E-01	7.790E+02	1.284E-01	7.790E+02
Eu-152	1.000E+02	0.000E+00	1.921E-01	5.206E+02	1.921E-01	5.206E+02
Pu-239	1.000E+02	0.000E+00	3.197E-02	3.128E+03	3.197E-02	3.128E+03
Pu-240	1.000E+02	0.000E+00	3.196E-02	3.129E+03	3.196E-02	3.129E+03
Sr-90	1.000E+02	0.000E+00	1.035E-01	9.665E+02	1.035E-01	9.665E+02
U-234	1.000E+02	0.000E+00	4.094E-03	2.443E+04	4.094E-03	2.443E+04
U-235	1.000E+02	0.000E+00	2.715E-02	3.684E+03	2.715E-02	3.684E+03
U-238	1.000E+02	0.000E+00	8.204E-03	1.219E+04	8.204E-03	1.219E+04

Individual Nuclide Dose Summed Over All Pathways
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr							
			t = 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Am-241	Am-241	1.000E+00	3.225E+00	3.199E+00	3.147E+00	2.969E+00	2.480E+00	9.771E-01	0.000E+00	0.000E+00
Np-237	Am-241	1.000E+00	2.064E-06	6.471E-06	1.518E-05	4.389E-05	1.111E-04	1.708E-04	0.000E+00	0.000E+00
U-233	Am-241	1.000E+00	1.125E-13	7.387E-13	3.718E-12	3.085E-11	2.173E-10	9.177E-10	0.000E+00	0.000E+00
Th-229	Am-241	1.000E+00	5.609E-17	8.213E-16	9.415E-15	2.403E-13	5.270E-12	1.014E-10	0.000E+00	0.000E+00
Co-60	Co-60	1.000E+00	4.322E+01	3.781E+01	2.893E+01	1.132E+01	7.682E-01	4.825E-05	0.000E+00	0.000E+00
Cs-134	Cs-134	1.000E+00	2.704E+01	1.927E+01	9.792E+00	9.142E-01	1.034E-03	3.919E-14	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	1.284E+01	1.251E+01	1.187E+01	9.889E+00	5.807E+00	7.016E-01	0.000E+00	0.000E+00
Eu-152	Eu-152	7.208E-01	1.385E+01	1.312E+01	1.178E+01	8.062E+00	2.703E+00	4.596E-02	0.000E+00	0.000E+00
Eu-152	Eu-152	2.792E-01	5.363E+00	5.082E+00	4.561E+00	3.123E+00	1.047E+00	1.780E-02	0.000E+00	0.000E+00
Eu-152	\$DOSE(j)		1.921E+01	1.820E+01	1.634E+01	1.118E+01	3.750E+00	6.376E-02	0.000E+00	0.000E+00
Gd-152	Eu-152	2.792E-01	5.876E-16	1.713E-15	3.750E-15	9.029E-15	1.460E-14	7.531E-15	0.000E+00	0.000E+00
Pu-239	Pu-239	1.000E+00	3.197E+00	3.175E+00	3.132E+00	2.982E+00	2.552E+00	1.055E+00	0.000E+00	0.000E+00
U-235	Pu-239	1.000E+00	1.334E-09	3.989E-09	9.208E-09	2.653E-08	6.828E-08	1.210E-07	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	2.714E+00	2.687E+00	2.635E+00	2.459E+00	2.003E+00	7.901E-01	0.000E+00	0.000E+00
U-235	\$DOSE(j)		2.714E+00	2.687E+00	2.635E+00	2.459E+00	2.003E+00	7.901E-01	0.000E+00	0.000E+00
Pa-231	Pu-239	1.000E+00	2.286E-13	1.755E-12	9.514E-12	8.120E-11	5.565E-10	2.059E-09	0.000E+00	0.000E+00
Pa-231	U-235	1.000E+00	7.467E-04	2.375E-03	5.549E-03	1.553E-02	3.543E-02	3.581E-02	0.000E+00	0.000E+00
Pa-231	\$DOSE(j)		7.467E-04	2.375E-03	5.549E-03	1.553E-02	3.543E-02	3.581E-02	0.000E+00	0.000E+00
Ac-227	Pu-239	1.000E+00	1.075E-15	1.261E-14	1.209E-13	2.558E-12	4.338E-11	4.142E-10	0.000E+00	0.000E+00
Ac-227	U-235	1.000E+00	3.974E-06	2.183E-05	9.715E-05	6.982E-04	3.866E-03	9.213E-03	0.000E+00	0.000E+00
Ac-227	\$DOSE(j)		3.974E-06	2.183E-05	9.715E-05	6.982E-04	3.866E-03	9.213E-03	0.000E+00	0.000E+00
Pu-240	Pu-240	1.000E+00	3.196E+00	3.174E+00	3.131E+00	2.979E+00	2.546E+00	1.046E+00	0.000E+00	0.000E+00
U-236	Pu-240	1.000E+00	5.647E-09	1.704E-08	3.935E-08	1.122E-07	2.759E-07	3.613E-07	0.000E+00	0.000E+00
Th-232	Pu-240	1.000E+00	8.730E-19	5.974E-18	3.089E-17	2.612E-16	1.868E-15	8.158E-15	0.000E+00	0.000E+00
Ra-228	Pu-240	1.000E+00	1.424E-19	2.127E-18	2.365E-17	5.133E-16	7.618E-15	6.938E-14	0.000E+00	0.000E+00
Th-228	Pu-240	1.000E+00	1.412E-20	4.020E-19	8.493E-18	3.802E-16	8.467E-15	9.154E-14	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	1.035E+01	1.003E+01	9.434E+00	7.590E+00	4.018E+00	3.099E-01	0.000E+00	0.000E+00
U-234	U-234	1.000E+00	4.094E-01	4.034E-01	3.915E-01	3.521E-01	2.563E-01	6.018E-02	0.000E+00	0.000E+00
U-234	U-238	1.000E+00	5.789E-07	1.714E-06	3.883E-06	1.048E-05	2.216E-05	1.715E-05	0.000E+00	0.000E+00
U-234	\$DOSE(j)		4.094E-01	4.034E-01	3.915E-01	3.521E-01	2.563E-01	6.020E-02	0.000E+00	0.000E+00

Individual Nuclide Dose Summed Over All Pathways
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr							
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
Th-230	U-234	1.000E+00	3.204E-06	9.402E-06	2.138E-05	5.925E-05	1.362E-04	1.441E-04	0.000E+00	0.000E+00
Th-230	U-238	1.000E+00	3.061E-12	2.082E-11	1.066E-10	8.708E-10	5.646E-09	1.775E-08	0.000E+00	0.000E+00
Th-230	\$DOSE(j)		3.204E-06	9.402E-06	2.138E-05	5.925E-05	1.362E-04	1.441E-04	0.000E+00	0.000E+00
Ra-226	U-234	1.000E+00	2.215E-08	1.561E-07	8.206E-07	7.074E-06	5.272E-05	2.891E-04	0.000E+00	0.000E+00
Ra-226	U-238	1.000E+00	1.559E-14	2.355E-13	2.732E-12	6.932E-11	1.462E-09	2.417E-08	0.000E+00	0.000E+00
Ra-226	\$DOSE(j)		2.215E-08	1.561E-07	8.206E-07	7.075E-06	5.273E-05	2.891E-04	0.000E+00	0.000E+00
Pb-210	U-234	1.000E+00	7.346E-11	1.045E-09	1.129E-08	2.572E-07	4.392E-06	3.593E-05	0.000E+00	0.000E+00
Pb-210	U-238	1.000E+00	4.154E-17	1.241E-15	2.896E-14	1.937E-12	9.595E-11	2.553E-09	0.000E+00	0.000E+00
Pb-210	\$DOSE(j)		7.346E-11	1.045E-09	1.129E-08	2.572E-07	4.392E-06	3.593E-05	0.000E+00	0.000E+00
U-238	U-238	1.000E+00	8.204E-01	8.105E-01	7.910E-01	7.258E-01	5.620E-01	1.812E-01	0.000E+00	0.000E+00

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 BRF(i) is the branch fraction of the parent nuclide.
 \$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g							
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
Am-241	Am-241	1.000E+00	1.000E+02	9.984E+01	9.951E+01	9.837E+01	9.519E+01	8.485E+01	6.109E+01	1.935E+01
Np-237	Am-241	1.000E+00	0.000E+00	3.236E-05	9.690E-05	3.209E-04	9.449E-04	2.953E-03	7.397E-03	1.381E-02
U-233	Am-241	1.000E+00	0.000E+00	7.075E-11	6.355E-10	7.011E-09	6.184E-08	6.404E-07	4.724E-06	2.693E-05
Th-229	Am-241	1.000E+00	0.000E+00	2.228E-15	6.005E-14	2.212E-12	5.880E-11	2.062E-09	4.778E-08	1.062E-06
Co-60	Co-60	1.000E+00	1.000E+02	8.767E+01	6.739E+01	2.683E+01	1.932E+00	1.934E-04	7.232E-16	0.000E+00
Cs-134	Cs-134	1.000E+00	1.000E+02	7.145E+01	3.647E+01	3.467E+00	4.168E-03	2.511E-13	1.541E-42	0.000E+00
Cs-137	Cs-137	1.000E+00	1.000E+02	9.771E+01	9.330E+01	7.935E+01	4.996E+01	9.892E+00	9.681E-02	8.975E-09
Eu-152	Eu-152	7.208E-01	7.208E+01	6.842E+01	6.166E+01	4.282E+01	1.512E+01	3.949E-01	1.185E-05	1.755E-21
Eu-152	Eu-152	2.792E-01	2.792E+01	2.650E+01	2.388E+01	1.659E+01	5.855E+00	1.530E-01	4.590E-06	6.798E-22
Eu-152	SS(j):		1.000E+02	9.493E+01	8.554E+01	5.941E+01	2.097E+01	5.478E-01	1.644E-05	2.435E-21
Gd-152	Eu-152	2.792E-01	0.000E+00	1.746E-13	4.976E-13	1.396E-12	2.716E-12	3.403E-12	3.374E-12	3.211E-12
Pu-239	Pu-239	1.000E+00	1.000E+02	1.000E+02	9.999E+01	9.996E+01	9.988E+01	9.960E+01	9.879E+01	9.604E+01
U-235	Pu-239	1.000E+00	0.000E+00	9.808E-08	2.919E-07	9.455E-07	2.619E-06	6.714E-06	1.093E-05	1.163E-05
U-235	U-235	1.000E+00	1.000E+02	9.919E+01	9.758E+01	9.216E+01	7.827E+01	4.418E+01	8.625E+00	2.835E-02
U-235	SS(j):		1.000E+02	9.919E+01	9.758E+01	9.216E+01	7.827E+01	4.418E+01	8.625E+00	2.836E-02
Pa-231	Pu-239	1.000E+00	0.000E+00	1.039E-12	9.290E-12	1.010E-10	8.549E-10	7.738E-09	4.176E-08	1.356E-07
Pa-231	U-235	1.000E+00	0.000E+00	2.106E-03	6.259E-03	2.020E-02	5.527E-02	1.353E-01	1.863E-01	9.277E-02
Pa-231	SS(j):		0.000E+00	2.106E-03	6.259E-03	2.020E-02	5.527E-02	1.353E-01	1.863E-01	9.277E-02
Ac-227	Pu-239	1.000E+00	0.000E+00	1.094E-14	2.889E-13	9.921E-12	2.181E-10	4.339E-09	3.349E-08	1.219E-07
Ac-227	U-235	1.000E+00	0.000E+00	3.319E-05	2.901E-04	2.915E-03	1.995E-02	9.733E-02	1.703E-01	8.802E-02
Ac-227	SS(j):		0.000E+00	3.319E-05	2.901E-04	2.915E-03	1.995E-02	9.733E-02	1.703E-01	8.802E-02
Pu-240	Pu-240	1.000E+00	1.000E+02	9.999E+01	9.996E+01	9.988E+01	9.965E+01	9.883E+01	9.653E+01	8.890E+01
U-236	Pu-240	1.000E+00	0.000E+00	2.958E-06	8.864E-06	2.941E-05	8.712E-05	2.778E-04	7.361E-04	1.634E-03
Th-232	Pu-240	1.000E+00	0.000E+00	7.299E-17	6.564E-16	7.271E-15	6.489E-14	7.000E-13	5.800E-12	4.923E-11
Ra-228	Pu-240	1.000E+00	0.000E+00	2.846E-18	7.244E-17	2.215E-15	3.859E-14	5.918E-13	5.470E-12	4.823E-11
Th-228	Pu-240	1.000E+00	0.000E+00	2.416E-19	1.632E-17	1.161E-15	3.096E-14	5.581E-13	5.373E-12	4.802E-11
Sr-90	Sr-90	1.000E+00	1.000E+02	9.762E+01	9.302E+01	7.856E+01	4.849E+01	8.958E+00	7.188E-02	3.327E-09
U-234	U-234	1.000E+00	1.000E+02	9.919E+01	9.758E+01	9.215E+01	7.826E+01	4.417E+01	8.617E+00	2.827E-02
U-234	U-238	1.000E+00	0.000E+00	2.812E-04	8.299E-04	2.613E-03	6.656E-03	1.252E-02	7.332E-03	8.025E-05
U-234	SS(j):		1.000E+02	9.919E+01	9.758E+01	9.215E+01	7.827E+01	4.418E+01	8.625E+00	2.835E-02

Summary : RESRAD HRNM Parameters Recreational Scenario - ALE
 File : RECREAT_HRNM_Ale.TEM

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g								
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-230	U-234	1.000E+00	0.000E+00	8.965E-04	2.668E-03	8.644E-03	2.395E-02	6.147E-02	1.005E-01	1.092E-01	
Th-230	U-238	1.000E+00	0.000E+00	1.269E-09	1.130E-08	1.209E-07	9.768E-07	7.542E-06	2.682E-05	3.785E-05	
Th-230	\$S(j):		0.000E+00	8.965E-04	2.668E-03	8.644E-03	2.395E-02	6.148E-02	1.005E-01	1.092E-01	
Ra-226	U-234	1.000E+00	0.000E+00	1.944E-07	1.738E-06	1.890E-05	1.599E-04	1.446E-03	7.774E-03	2.502E-02	
Ra-226	U-238	1.000E+00	0.000E+00	1.835E-13	4.910E-12	1.763E-10	4.365E-09	1.204E-07	1.509E-06	7.896E-06	
Ra-226	\$S(j):		0.000E+00	1.944E-07	1.738E-06	1.890E-05	1.599E-04	1.446E-03	7.775E-03	2.502E-02	
Pb-210	U-234	1.000E+00	0.000E+00	2.000E-09	5.290E-08	1.826E-06	4.064E-05	8.321E-04	6.588E-03	2.405E-02	
Pb-210	U-238	1.000E+00	0.000E+00	1.418E-15	1.126E-13	1.299E-11	8.711E-10	5.881E-08	1.201E-06	7.544E-06	
Pb-210	\$S(j):		0.000E+00	2.000E-09	5.290E-08	1.826E-06	4.064E-05	8.322E-04	6.590E-03	2.406E-02	
U-238	U-238	1.000E+00	1.000E+02	9.919E+01	9.758E+01	9.216E+01	7.827E+01	4.418E+01	8.625E+00	2.835E-02	

BRF(i) is the branch fraction of the parent nuclide.
 \$ is used to indicate summation; the Greek sigma is not included in this font.

RESRAD.EXE execution time = 2.31 seconds

Appendix B

RESRAD 6.21 Output for the Agricultural Resident Scenario

Appendix B

RESRAD 6.21 Output for the Agricultural Resident Scenario

RESRAD, Version 6.21 T½ Limit = 0.5 year 02/08/2004 17:07 Page 1
Summary : Resident Farmer Scenario - HRNM Parameters - ALE
File : RES_FARM_HRNM_Ale.TEM

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Time = 0.000E+00	16
Time = 1.000E+00	17
Time = 3.000E+00	18
Time = 1.000E+01	19
Time = 2.500E+01	20
Time = 3.000E+01	21
Time = 1.000E+02	22
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Dose Conversion Factor (and Related) Parameter Summary
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name

B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2 (1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2 (2)
B-1	Co-60	2.190E-04	2.190E-04	DCF2 (3)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2 (4)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2 (5)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2 (6)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2 (8)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2 (9)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2 (10)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2 (11)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2 (12)
B-1	Pu-240	4.290E-01	4.290E-01	DCF2 (13)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2 (14)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2 (15)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2 (16)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2 (17)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2 (18)
B-1	Th-230	3.260E-01	3.260E-01	DCF2 (19)
B-1	Th-232	1.640E+00	1.640E+00	DCF2 (20)
B-1	U-233	1.350E-01	1.350E-01	DCF2 (21)
B-1	U-234	1.320E-01	1.320E-01	DCF2 (22)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2 (23)
B-1	U-236	1.250E-01	1.250E-01	DCF2 (24)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2 (25)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3 (1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3 (2)
D-1	Co-60	2.690E-05	2.690E-05	DCF3 (3)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3 (4)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3 (5)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3 (6)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3 (8)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3 (9)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3 (10)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3 (11)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3 (12)
D-1	Pu-240	3.540E-03	3.540E-03	DCF3 (13)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3 (14)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3 (15)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3 (16)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3 (17)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3 (18)
D-1	Th-230	5.480E-04	5.480E-04	DCF3 (19)
D-1	Th-232	2.730E-03	2.730E-03	DCF3 (20)
D-1	U-233	2.890E-04	2.890E-04	DCF3 (21)
D-1	U-234	2.830E-04	2.830E-04	DCF3 (22)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3 (23)
D-1	U-236	2.690E-04	2.690E-04	DCF3 (24)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-1	U-238+D	2.690E-04	2.690E-04	DCF3 (25)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(3,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(3,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(3,3)
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(4,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(4,3)
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(5,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,3)
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(9,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(9,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(9,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(10,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(10,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(10,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(11,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(11,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(11,3)
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(12,3)
D-34	Pu-240 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Pu-240 , beef/livestock-intake ratio, (pCi/Kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Pu-240 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(13,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(14,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,3)
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(15,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(15,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(15,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(16,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(16,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(16,3)
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(17,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(17,3)
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(18,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(18,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(18,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(19,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(19,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(19,3)
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(20,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(20,3)
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(21,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(21,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(21,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(22,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(22,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(22,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(23,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(23,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(23,3)
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(24,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(24,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(24,3)
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(25,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(25,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(25,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(3,2)
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(4,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(5,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(8,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(9,2)
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(10,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(10,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(11,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(12,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(12,2)
D-5	Pu-240 , fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Pu-240 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(13,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(14,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(14,2)
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(15,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(15,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(16,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(16,2)
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(17,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(17,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC (18,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (18,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC (19,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (19,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC (20,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC (20,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC (21,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (21,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC (22,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (22,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC (23,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (23,2)
D-5				
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC (24,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (24,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC (25,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC (25,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.880E+08	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	9.000E+03	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T (2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T (3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T (4)
R011	Times for calculations (yr)	2.500E+01	3.000E+01	---	T (5)
R011	Times for calculations (yr)	3.000E+01	1.000E+02	---	T (6)
R011	Times for calculations (yr)	1.000E+02	3.000E+02	---	T (7)
R011	Times for calculations (yr)	5.000E+02	1.000E+03	---	T (8)
R011	Times for calculations (yr)	1.000E+03	0.000E+00	---	T (9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g) : Am-241	1.000E+02	0.000E+00	---	S1 (2)
R012	Initial principal radionuclide (pCi/g) : Co-60	1.000E+02	0.000E+00	---	S1 (3)
R012	Initial principal radionuclide (pCi/g) : Cs-134	1.000E+02	0.000E+00	---	S1 (4)
R012	Initial principal radionuclide (pCi/g) : Cs-137	1.000E+02	0.000E+00	---	S1 (5)
R012	Initial principal radionuclide (pCi/g) : Eu-152	1.000E+02	0.000E+00	---	S1 (6)
R012	Initial principal radionuclide (pCi/g) : Pu-239	1.000E+02	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g) : Pu-240	1.000E+02	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g) : Sr-90	1.000E+02	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g) : U-234	1.000E+02	0.000E+00	---	S1(22)
R012	Initial principal radionuclide (pCi/g) : U-235	1.000E+02	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g) : U-238	1.000E+02	0.000E+00	---	S1(25)
R012	Concentration in groundwater (pCi/L) : Am-241	not used	0.000E+00	---	W1 (2)
R012	Concentration in groundwater (pCi/L) : Co-60	not used	0.000E+00	---	W1 (3)
R012	Concentration in groundwater (pCi/L) : Cs-134	not used	0.000E+00	---	W1 (4)
R012	Concentration in groundwater (pCi/L) : Cs-137	not used	0.000E+00	---	W1 (5)
R012	Concentration in groundwater (pCi/L) : Eu-152	not used	0.000E+00	---	W1 (6)
R012	Concentration in groundwater (pCi/L) : Pu-239	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L) : Pu-240	not used	0.000E+00	---	W1(13)
R012	Concentration in groundwater (pCi/L) : Sr-90	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L) : U-234	not used	0.000E+00	---	W1(22)
R012	Concentration in groundwater (pCi/L) : U-235	not used	0.000E+00	---	W1(23)
R012	Concentration in groundwater (pCi/L) : U-238	not used	0.000E+00	---	W1(25)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	V CZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.500E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Precipitation (m/yr)	1.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	3.000E-02	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.100E+09	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.530E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.250E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.050E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	4.600E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.200E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	2.500E+02	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.500E+03	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	2.000E+02	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.288E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.847E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.432E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.000E+03	1.000E+03	---	DCNUCC (5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCU (5,1)
R016	Saturated zone (cm**3/g)	5.000E+01	1.000E+03	---	DCNUCS (5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.716E-04	ALEACH (5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (5)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (6)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (6,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.160E-04	ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (6)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	5.000E+03	2.000E+03	---	DCNUCC (12)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCU (12,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+03	---	DCNUCS (12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.864E-05	ALEACH (12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (12)
R016	Distribution coefficients for Pu-240				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC (13)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCU (13,1)
R016	Saturated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCS (13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.716E-04	ALEACH (13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (13)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.800E+02	3.000E+01	---	DCNUCC (16)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	3.000E+01	---	DCNUCU (16,1)
R016	Saturated zone (cm**3/g)	2.500E+01	3.000E+01	---	DCNUCS (16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.905E-03	ALEACH (16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (16)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC (22)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU (22,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS (22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.817E-02	ALEACH (22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (22)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC (23)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU (23,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS (23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.817E-02	ALEACH (23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (23)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	7.000E+00	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	2.500E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.817E-02	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.705E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.160E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.333E-03	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.847E-03	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.428E-03	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.894E-03	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (15)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (15,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.894E-03	ALEACH (15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (15)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (17)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (17,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.720E-06	ALEACH (17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (17)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (18)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (18,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.720E-06	ALEACH (18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (18)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (19)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (19,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.720E-06	ALEACH (19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (19)
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC (20)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU (20,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS (20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.720E-06	ALEACH (20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (20)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (21)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (21,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.847E-03	ALEACH (21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (21)
R016	Distribution coefficients for daughter U-236				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (24)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (24,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.847E-03	ALEACH (24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (24)
R017	Inhalation rate (m**3/yr)	7.300E+03	8.400E+03	---	INHALR

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Mass loading for inhalation (g/m**3)	5.000E-05	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	8.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.000E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE (1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE (2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE (3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE (4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE (5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE (6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE (7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE (8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE (9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE (10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE (11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE (12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA (1)
R017	Ring 2	not used	2.732E-01	---	FRACA (2)
R017	Ring 3	not used	0.000E+00	---	FRACA (3)
R017	Ring 4	not used	0.000E+00	---	FRACA (4)
R017	Ring 5	not used	0.000E+00	---	FRACA (5)
R017	Ring 6	not used	0.000E+00	---	FRACA (6)
R017	Ring 7	not used	0.000E+00	---	FRACA (7)
R017	Ring 8	not used	0.000E+00	---	FRACA (8)
R017	Ring 9	not used	0.000E+00	---	FRACA (9)
R017	Ring 10	not used	0.000E+00	---	FRACA (10)
R017	Ring 11	not used	0.000E+00	---	FRACA (11)
R017	Ring 12	not used	0.000E+00	---	FRACA (12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.100E+02	1.600E+02	---	DIET (1)
R018	Leafy vegetable consumption (kg/yr)	2.700E+00	1.400E+01	---	DIET (2)
R018	Milk consumption (L/yr)	1.000E+02	9.200E+01	---	DIET (3)
R018	Meat and poultry consumption (kg/yr)	3.600E+01	6.300E+01	---	DIET (4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET (5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET (6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	7.300E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV (1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV (2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV (3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE (1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE (2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE (3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV (1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV (2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV (3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY (1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY (2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY (3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET (1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET (2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET (3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T (1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T (2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T (3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T (4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T (5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T (6)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:*****	square meters	Am-241	1.000E+02
Thickness:	0.15 meters	Co-60	1.000E+02
Cover Depth:	0.00 meters	Cs-134	1.000E+02
		Cs-137	1.000E+02
		Eu-152	1.000E+02
		Pu-239	1.000E+02
		Pu-240	1.000E+02
		Sr-90	1.000E+02
		U-234	1.000E+02
		U-235	1.000E+02
		U-238	1.000E+02

Total Dose TDOSE(t), mrem/yr									
Basic Radiation Dose Limit = 1.000E+02 mrem/yr									
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)									
t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
TDOSE(t):	2.273E+03	1.977E+03	1.545E+03	8.274E+02	3.699E+02	3.028E+02	3.925E+01	0.000E+00	0.000E+00
M(t):	2.273E+01	1.977E+01	1.545E+01	8.274E+00	3.699E+00	3.028E+00	3.925E-01	0.000E+00	0.000E+00

Maximum TDOSE(t): 2.273E+03 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.967E+00	0.0013	3.164E+00	0.0014	0.000E+00	0.0000	6.918E+00	0.0030	3.343E-01	0.0001	3.696E-02	0.0000	1.058E+01	0.0047
Co-60	8.827E+02	0.3883	1.459E-03	0.0000	0.000E+00	0.0000	3.765E+00	0.0017	2.542E+00	0.0011	6.186E-01	0.0003	7.312E-02	0.0000
Cs-134	4.920E+02	0.2164	2.805E-04	0.0000	0.000E+00	0.0000	4.665E+00	0.0021	6.398E+00	0.0028	4.307E+00	0.0019	1.812E-01	0.0001
Cs-137	2.073E+02	0.0912	2.249E-04	0.0000	0.000E+00	0.0000	3.703E+00	0.0016	5.080E+00	0.0022	3.419E+00	0.0015	1.438E-01	0.0001
Eu-152	4.077E+02	0.1794	1.536E-03	0.0000	0.000E+00	0.0000	2.974E-02	0.0000	2.398E-02	0.0000	6.590E-04	0.0000	1.837E-02	0.0000
Pu-239	1.942E-02	0.0000	3.060E+00	0.0013	0.000E+00	0.0000	6.734E+00	0.0030	6.508E-01	0.0003	1.799E-02	0.0000	1.030E+01	0.0045
Pu-240	9.978E-03	0.0000	3.060E+00	0.0013	0.000E+00	0.0000	6.733E+00	0.0030	6.507E-01	0.0003	1.799E-02	0.0000	1.030E+01	0.0045
Sr-90	1.567E+00	0.0007	9.225E-03	0.0000	0.000E+00	0.0000	8.486E+01	0.0373	1.693E+01	0.0074	9.795E+00	0.0043	4.396E-01	0.0002
U-234	2.650E-02	0.0000	9.193E-01	0.0004	0.000E+00	0.0000	1.304E+00	0.0006	1.789E-01	0.0001	8.655E-01	0.0004	8.041E-01	0.0004
U-235	4.854E+01	0.0214	8.567E-01	0.0004	0.000E+00	0.0000	1.232E+00	0.0005	1.698E-01	0.0001	8.166E-01	0.0004	7.590E-01	0.0003
U-238	9.129E+00	0.0040	8.218E-01	0.0004	0.000E+00	0.0000	1.239E+00	0.0005	1.700E-01	0.0001	8.227E-01	0.0004	7.643E-01	0.0003
===== Total	2.052E+03	0.9027	1.189E+01	0.0052	0.000E+00	0.0000	1.212E+02	0.0533	3.313E+01	0.0146	2.072E+01	0.0091	3.437E+01	0.0151

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.400E+01	0.0106
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.897E+02	0.3914
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.076E+02	0.2233
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.196E+02	0.0966
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.078E+02	0.1794
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.078E+01	0.0091
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.077E+01	0.0091
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E+02	0.0500
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.098E+00	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.237E+01	0.0230
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.295E+01	0.0057
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.273E+03	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.962E+00	0.0015	3.137E+00	0.0016	0.000E+00	0.0000	6.859E+00	0.0035	3.315E-01	0.0002	3.665E-02	0.0000	1.049E+01	0.0053
Co-60	7.671E+02	0.3881	1.262E-03	0.0000	0.000E+00	0.0000	3.257E+00	0.0016	2.199E+00	0.0011	5.351E-01	0.0003	6.324E-02	0.0000
Cs-134	3.509E+02	0.1775	1.990E-04	0.0000	0.000E+00	0.0000	3.310E+00	0.0017	4.540E+00	0.0023	3.056E+00	0.0015	1.285E-01	0.0001
Cs-137	2.022E+02	0.1023	2.183E-04	0.0000	0.000E+00	0.0000	3.594E+00	0.0018	4.930E+00	0.0025	3.318E+00	0.0017	1.396E-01	0.0001
Eu-152	3.862E+02	0.1954	1.448E-03	0.0000	0.000E+00	0.0000	2.804E-02	0.0000	2.261E-02	0.0000	6.212E-04	0.0000	1.732E-02	0.0000
Pu-239	1.941E-02	0.0000	3.039E+00	0.0015	0.000E+00	0.0000	6.688E+00	0.0034	6.464E-01	0.0003	1.787E-02	0.0000	1.023E+01	0.0052
Pu-240	9.975E-03	0.0000	3.038E+00	0.0015	0.000E+00	0.0000	6.686E+00	0.0034	6.462E-01	0.0003	1.786E-02	0.0000	1.023E+01	0.0052
Sr-90	1.525E+00	0.0008	8.931E-03	0.0000	0.000E+00	0.0000	8.216E+01	0.0416	1.640E+01	0.0083	9.484E+00	0.0048	4.256E-01	0.0002
U-234	2.525E-02	0.0000	8.702E-01	0.0004	0.000E+00	0.0000	1.234E+00	0.0006	1.694E-01	0.0001	8.193E-01	0.0004	7.612E-01	0.0004
U-235	4.622E+01	0.0234	8.111E-01	0.0004	0.000E+00	0.0000	1.171E+00	0.0006	1.632E-01	0.0001	7.730E-01	0.0004	7.191E-01	0.0004
U-238	8.686E+00	0.0044	7.779E-01	0.0004	0.000E+00	0.0000	1.173E+00	0.0006	1.610E-01	0.0001	7.788E-01	0.0004	7.235E-01	0.0004
===== Total	1.766E+03	0.8933	1.169E+01	0.0059	0.000E+00	0.0000	1.162E+02	0.0588	3.021E+01	0.0153	1.884E+01	0.0095	3.393E+01	0.0172

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.382E+01	0.0121
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.731E+02	0.3911
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.619E+02	0.1831
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.142E+02	0.1084
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.863E+02	0.1954
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.064E+01	0.0104
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.063E+01	0.0104
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.100E+02	0.0557
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.880E+00	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.985E+01	0.0252
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.230E+01	0.0062
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E+03	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.951E+00	0.0019	3.084E+00	0.0020	0.000E+00	0.0000	6.742E+00	0.0044	3.258E-01	0.0002	3.602E-02	0.0000	1.031E+01	0.0067
Co-60	5.792E+02	0.3749	9.440E-04	0.0000	0.000E+00	0.0000	2.436E+00	0.0016	1.645E+00	0.0011	4.003E-01	0.0003	4.731E-02	0.0000
Cs-134	1.784E+02	0.1155	1.002E-04	0.0000	0.000E+00	0.0000	1.666E+00	0.0011	2.285E+00	0.0015	1.538E+00	0.0010	6.470E-02	0.0000
Cs-137	1.923E+02	0.1245	2.055E-04	0.0000	0.000E+00	0.0000	3.384E+00	0.0022	4.643E+00	0.0030	3.125E+00	0.0020	1.314E-01	0.0001
Eu-152	3.464E+02	0.2243	1.286E-03	0.0000	0.000E+00	0.0000	2.491E-02	0.0000	2.008E-02	0.0000	5.518E-04	0.0000	1.538E-02	0.0000
Pu-239	1.938E-02	0.0000	2.998E+00	0.0019	0.000E+00	0.0000	6.597E+00	0.0043	6.376E-01	0.0004	1.762E-02	0.0000	1.009E+01	0.0065
Pu-240	9.968E-03	0.0000	2.996E+00	0.0019	0.000E+00	0.0000	6.593E+00	0.0043	6.372E-01	0.0004	1.761E-02	0.0000	1.009E+01	0.0065
Sr-90	1.446E+00	0.0009	8.369E-03	0.0000	0.000E+00	0.0000	7.699E+01	0.0498	1.537E+01	0.0099	8.888E+00	0.0058	3.988E-01	0.0003
U-234	2.294E-02	0.0000	7.797E-01	0.0005	0.000E+00	0.0000	1.106E+00	0.0007	1.518E-01	0.0001	7.341E-01	0.0005	6.820E-01	0.0004
U-235	4.190E+01	0.0271	7.272E-01	0.0005	0.000E+00	0.0000	1.057E+00	0.0007	1.508E-01	0.0001	6.926E-01	0.0004	6.456E-01	0.0004
U-238	7.863E+00	0.0051	6.969E-01	0.0005	0.000E+00	0.0000	1.051E+00	0.0007	1.443E-01	0.0001	6.978E-01	0.0005	6.482E-01	0.0004
Total	1.351E+03	0.8743	1.129E+01	0.0073	0.000E+00	0.0000	1.076E+02	0.0697	2.601E+01	0.0168	1.615E+01	0.0105	3.313E+01	0.0214

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.345E+01	0.0152
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.837E+02	0.3779
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.839E+02	0.1191
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.036E+02	0.1318
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.465E+02	0.2243
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.036E+01	0.0132
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.034E+01	0.0132
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E+02	0.0667
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.476E+00	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.518E+01	0.0292
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.110E+01	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.545E+03	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.913E+00	0.0035	2.899E+00	0.0035	0.000E+00	0.0000	6.339E+00	0.0077	3.063E-01	0.0004	3.386E-02	0.0000	9.696E+00	0.0117
Co-60	2.164E+02	0.2615	3.413E-04	0.0000	0.000E+00	0.0000	8.809E-01	0.0011	5.948E-01	0.0007	1.447E-01	0.0002	1.710E-02	0.0000
Cs-134	1.670E+01	0.0202	9.046E-06	0.0000	0.000E+00	0.0000	1.505E-01	0.0002	2.064E-01	0.0002	1.389E-01	0.0002	5.843E-03	0.0000
Cs-137	1.614E+02	0.1950	1.663E-04	0.0000	0.000E+00	0.0000	2.738E+00	0.0033	3.756E+00	0.0045	2.528E+00	0.0031	1.063E-01	0.0001
Eu-152	2.366E+02	0.2859	8.485E-04	0.0000	0.000E+00	0.0000	1.643E-02	0.0000	1.325E-02	0.0000	3.641E-04	0.0000	1.015E-02	0.0000
Pu-239	1.925E-02	0.0000	2.852E+00	0.0034	0.000E+00	0.0000	6.278E+00	0.0076	6.067E-01	0.0007	1.677E-02	0.0000	9.603E+00	0.0116
Pu-240	9.944E-03	0.0000	2.847E+00	0.0034	0.000E+00	0.0000	6.266E+00	0.0076	6.055E-01	0.0007	1.674E-02	0.0000	9.585E+00	0.0116
Sr-90	1.198E+00	0.0014	6.657E-03	0.0000	0.000E+00	0.0000	6.124E+01	0.0740	1.222E+01	0.0148	7.070E+00	0.0085	3.172E-01	0.0004
U-234	1.645E-02	0.0000	5.300E-01	0.0006	0.000E+00	0.0000	7.518E-01	0.0009	1.032E-01	0.0001	4.989E-01	0.0006	4.636E-01	0.0006
U-235	2.973E+01	0.0359	4.963E-01	0.0006	0.000E+00	0.0000	7.420E-01	0.0009	1.156E-01	0.0001	4.708E-01	0.0006	4.432E-01	0.0005
U-238	5.545E+00	0.0067	4.737E-01	0.0006	0.000E+00	0.0000	7.145E-01	0.0009	9.807E-02	0.0001	4.743E-01	0.0006	4.406E-01	0.0005
===== Total	6.705E+02	0.8103	1.011E+01	0.0122	0.000E+00	0.0000	8.611E+01	0.1041	1.863E+01	0.0225	1.139E+01	0.0138	3.069E+01	0.0371

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.219E+01	0.0268
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.181E+02	0.2635
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.720E+01	0.0208
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.705E+02	0.2061
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.366E+02	0.2860
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E+01	0.0234
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E+01	0.0234
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.205E+01	0.0992
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.364E+00	0.0029
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.199E+01	0.0387
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.746E+00	0.0094
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.274E+02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.500E+01 years

Radio- Nuclide	Ground		Water Independent Pathways (Inhalation excludes radon)				Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.832E+00	0.0077	2.517E+00	0.0068	0.000E+00	0.0000	5.505E+00	0.0149	2.660E-01	0.0007	2.940E-02	0.0001	8.419E+00	0.0228
Co-60	2.609E+01	0.0705	3.824E-05	0.0000	0.000E+00	0.0000	9.869E-02	0.0003	6.664E-02	0.0002	1.622E-02	0.0000	1.916E-03	0.0000
Cs-134	1.038E-01	0.0003	5.188E-08	0.0000	0.000E+00	0.0000	8.629E-04	0.0000	1.184E-03	0.0000	7.967E-04	0.0000	3.351E-05	0.0000
Cs-137	1.102E+02	0.2978	1.047E-04	0.0000	0.000E+00	0.0000	1.724E+00	0.0047	2.365E+00	0.0064	1.591E+00	0.0043	6.694E-02	0.0002
Eu-152	1.039E+02	0.2808	3.450E-04	0.0000	0.000E+00	0.0000	6.681E-03	0.0000	5.388E-03	0.0000	1.480E-04	0.0000	4.127E-03	0.0000
Pu-239	1.892E-02	0.0001	2.542E+00	0.0069	0.000E+00	0.0000	5.595E+00	0.0151	5.407E-01	0.0015	1.494E-02	0.0000	8.558E+00	0.0231
Pu-240	9.887E-03	0.0000	2.530E+00	0.0068	0.000E+00	0.0000	5.569E+00	0.0151	5.382E-01	0.0015	1.488E-02	0.0000	8.519E+00	0.0230
Sr-90	7.963E-01	0.0022	4.040E-03	0.0000	0.000E+00	0.0000	3.717E+01	0.1005	7.419E+00	0.0201	4.291E+00	0.0116	1.925E-01	0.0005
U-234	8.415E-03	0.0000	2.298E-01	0.0006	0.000E+00	0.0000	3.259E-01	0.0009	4.472E-02	0.0001	2.162E-01	0.0006	2.010E-01	0.0005
U-235	1.419E+01	0.0384	2.198E-01	0.0006	0.000E+00	0.0000	3.591E-01	0.0010	6.951E-02	0.0002	2.042E-01	0.0006	2.000E-01	0.0005
U-238	2.610E+00	0.0071	2.053E-01	0.0006	0.000E+00	0.0000	3.096E-01	0.0008	4.250E-02	0.0001	2.055E-01	0.0006	1.909E-01	0.0005
Total	2.607E+02	0.7048	8.249E+00	0.0223	0.000E+00	0.0000	5.666E+01	0.1532	1.136E+01	0.0307	6.585E+00	0.0178	2.635E+01	0.0712

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.500E+01 years

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.957E+01	0.0529
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.627E+01	0.0710
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.067E-01	0.0003
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.159E+02	0.3134
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.039E+02	0.2808
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.727E+01	0.0467
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E+01	0.0464
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.987E+01	0.1348
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E+00	0.0028
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.524E+01	0.0412
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.564E+00	0.0096
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.699E+02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.805E+00	0.0093	2.394E+00	0.0079	0.000E+00	0.0000	5.236E+00	0.0173	2.530E-01	0.0008	2.797E-02	0.0001	8.007E+00	0.0264
Co-60	1.286E+01	0.0425	1.838E-05	0.0000	0.000E+00	0.0000	4.743E-02	0.0002	3.203E-02	0.0001	7.793E-03	0.0000	9.209E-04	0.0000
Cs-134	1.904E-02	0.0001	9.258E-09	0.0000	0.000E+00	0.0000	1.540E-04	0.0000	2.113E-04	0.0000	1.422E-04	0.0000	5.980E-06	0.0000
Cs-137	9.681E+01	0.3197	8.943E-05	0.0000	0.000E+00	0.0000	1.473E+00	0.0049	2.020E+00	0.0067	1.360E+00	0.0045	5.719E-02	0.0002
Eu-152	7.878E+01	0.2602	2.548E-04	0.0000	0.000E+00	0.0000	4.934E-03	0.0000	3.979E-03	0.0000	1.093E-04	0.0000	3.048E-03	0.0000
Pu-239	1.879E-02	0.0001	2.439E+00	0.0081	0.000E+00	0.0000	5.367E+00	0.0177	5.187E-01	0.0017	1.434E-02	0.0000	8.211E+00	0.0271
Pu-240	9.866E-03	0.0000	2.425E+00	0.0080	0.000E+00	0.0000	5.338E+00	0.0176	5.159E-01	0.0017	1.426E-02	0.0000	8.166E+00	0.0270
Sr-90	6.939E-01	0.0023	3.410E-03	0.0000	0.000E+00	0.0000	3.137E+01	0.1036	6.262E+00	0.0207	3.622E+00	0.0120	1.625E-01	0.0005
U-234	6.874E-03	0.0000	1.735E-01	0.0006	0.000E+00	0.0000	2.460E-01	0.0008	3.374E-02	0.0001	1.631E-01	0.0005	1.517E-01	0.0005
U-235	1.108E+01	0.0366	1.680E-01	0.0006	0.000E+00	0.0000	2.856E-01	0.0009	5.972E-02	0.0002	1.541E-01	0.0005	1.542E-01	0.0005
U-238	2.026E+00	0.0067	1.549E-01	0.0005	0.000E+00	0.0000	2.336E-01	0.0008	3.206E-02	0.0001	1.550E-01	0.0005	1.440E-01	0.0005
Total	2.051E+02	0.6774	7.758E+00	0.0256	0.000E+00	0.0000	4.960E+01	0.1638	9.732E+00	0.0321	5.518E+00	0.0182	2.506E+01	0.0828

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.872E+01	0.0618
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.295E+01	0.0428
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.956E-02	0.0001
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E+02	0.3360
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.879E+01	0.2602
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.657E+01	0.0547
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.647E+01	0.0544
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.212E+01	0.1391
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.748E-01	0.0026
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.190E+01	0.0393
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.746E+00	0.0091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.028E+02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.300E+00	0.0586	8.723E-01	0.0222	0.000E+00	0.0000	1.910E+00	0.0487	9.233E-02	0.0024	1.019E-02	0.0003	2.918E+00	0.0743
Co-60	5.076E-04	0.0000	4.739E-10	0.0000	0.000E+00	0.0000	1.224E-06	0.0000	8.272E-07	0.0000	2.011E-07	0.0000	2.375E-08	0.0000
Cs-134	7.402E-13	0.0000	2.260E-19	0.0000	0.000E+00	0.0000	3.761E-15	0.0000	5.165E-15	0.0000	3.474E-15	0.0000	1.460E-16	0.0000
Cs-137	1.258E+01	0.3205	7.263E-06	0.0000	0.000E+00	0.0000	1.196E-01	0.0030	1.643E-01	0.0042	1.105E-01	0.0028	4.645E-03	0.0001
Eu-152	1.308E+00	0.0333	2.691E-06	0.0000	0.000E+00	0.0000	5.215E-05	0.0000	4.207E-05	0.0000	1.155E-06	0.0000	3.220E-05	0.0000
Pu-239	1.441E-02	0.0004	1.003E+00	0.0256	0.000E+00	0.0000	2.209E+00	0.0563	2.136E-01	0.0054	5.899E-03	0.0002	3.378E+00	0.0861
Pu-240	9.206E-03	0.0002	9.853E-01	0.0251	0.000E+00	0.0000	2.169E+00	0.0553	2.097E-01	0.0053	5.794E-03	0.0001	3.317E+00	0.0845
Sr-90	8.201E-02	0.0021	2.336E-04	0.0000	0.000E+00	0.0000	2.150E+00	0.0548	4.298E-01	0.0110	2.484E-01	0.0063	1.113E-02	0.0003
U-234	2.254E-03	0.0001	2.605E-03	0.0001	0.000E+00	0.0000	3.879E-03	0.0001	5.079E-04	0.0000	2.354E-03	0.0001	2.281E-03	0.0001
U-235	2.977E-01	0.0076	5.905E-03	0.0002	0.000E+00	0.0000	2.412E-02	0.0006	1.031E-02	0.0003	2.306E-03	0.0001	7.172E-03	0.0002
U-238	4.778E-02	0.0012	2.203E-03	0.0001	0.000E+00	0.0000	3.324E-03	0.0001	4.564E-04	0.0000	2.205E-03	0.0001	2.049E-03	0.0001
===== Total	1.664E+01	0.4239	2.872E+00	0.0732	0.000E+00	0.0000	8.589E+00	0.2188	1.121E+00	0.0286	3.877E-01	0.0099	9.640E+00	0.2456

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.102E+00	0.2064
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.099E-04	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.528E-13	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E+01	0.3306
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E+00	0.0333
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.824E+00	0.1739
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.697E+00	0.1706
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.922E+00	0.0744
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-02	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.475E-01	0.0089
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.802E-02	0.0015
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.925E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-240	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
===== Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g)									
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
Am-241	Am-241	1.000E+00	2.400E-01	2.382E-01	2.345E-01	2.219E-01	1.957E-01	1.872E-01	8.099E-02	0.000E+00	0.000E+00	
Am-241	Np-237	1.000E+00	4.109E-07	1.260E-06	2.931E-06	8.417E-06	1.832E-05	2.107E-05	3.144E-05	0.000E+00	0.000E+00	
Am-241	U-233	1.000E+00	1.289E-14	7.962E-14	3.882E-13	3.124E-12	1.551E-11	2.094E-11	7.629E-11	0.000E+00	0.000E+00	
Am-241	Th-229	1.000E+00	7.844E-18	1.154E-16	1.326E-15	3.381E-14	4.442E-13	7.377E-13	1.413E-11	0.000E+00	0.000E+00	
Am-241	\$DSR(j)		2.400E-01	2.382E-01	2.345E-01	2.219E-01	1.957E-01	1.872E-01	8.102E-02	0.000E+00	0.000E+00	
Co-60	Co-60	1.000E+00	8.897E+00	7.731E+00	5.837E+00	2.181E+00	2.627E-01	1.295E-01	5.099E-06	0.000E+00	0.000E+00	
Cs-134	Cs-134	1.000E+00	5.076E+00	3.619E+00	1.839E+00	1.720E-01	1.067E-03	1.956E-04	7.528E-15	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	2.196E+00	2.142E+00	2.036E+00	1.705E+00	1.159E+00	1.017E+00	1.298E-01	0.000E+00	0.000E+00	
Eu-152	Eu-152	7.208E-01	2.940E+00	2.784E+00	2.497E+00	1.706E+00	7.488E-01	5.679E-01	9.428E-03	0.000E+00	0.000E+00	
Eu-152	Eu-152	2.792E-01	1.139E+00	1.078E+00	9.674E-01	6.606E-01	2.901E-01	2.200E-01	3.652E-03	0.000E+00	0.000E+00	
Eu-152	Gd-152	2.792E-01	3.156E-17	9.196E-17	2.012E-16	4.833E-16	7.484E-16	7.762E-16	3.907E-16	0.000E+00	0.000E+00	
Eu-152	\$DSR(j)		1.139E+00	1.078E+00	9.674E-01	6.606E-01	2.901E-01	2.200E-01	3.652E-03	0.000E+00	0.000E+00	
Pu-239	Pu-239	1.000E+00	2.078E-01	2.064E-01	2.036E-01	1.938E-01	1.727E-01	1.657E-01	6.824E-02	0.000E+00	0.000E+00	
Pu-239	U-235	1.000E+00	2.595E-10	7.620E-10	1.693E-09	4.293E-09	7.462E-09	8.043E-09	7.395E-09	0.000E+00	0.000E+00	
Pu-239	Pa-231	1.000E+00	1.132E-14	8.237E-14	4.261E-13	3.261E-12	1.350E-11	1.719E-11	3.292E-11	0.000E+00	0.000E+00	
Pu-239	Ac-227	1.000E+00	9.433E-17	1.270E-15	1.332E-14	2.788E-13	2.559E-12	3.796E-12	1.893E-11	0.000E+00	0.000E+00	
Pu-239	\$DSR(j)		2.078E-01	2.064E-01	2.036E-01	1.938E-01	1.727E-01	1.657E-01	6.824E-02	0.000E+00	0.000E+00	
Pu-240	Pu-240	1.000E+00	2.077E-01	2.063E-01	2.034E-01	1.933E-01	1.718E-01	1.647E-01	6.697E-02	0.000E+00	0.000E+00	
Pu-240	U-236	1.000E+00	5.757E-10	1.730E-09	3.971E-09	1.109E-08	2.284E-08	2.578E-08	2.803E-08	0.000E+00	0.000E+00	
Pu-240	Th-232	1.000E+00	6.425E-20	4.367E-19	2.245E-18	1.871E-17	9.491E-17	1.288E-16	4.966E-16	0.000E+00	0.000E+00	
Pu-240	Ra-228	1.000E+00	3.364E-20	4.993E-19	5.505E-18	1.169E-16	1.094E-15	1.648E-15	1.281E-14	0.000E+00	0.000E+00	
Pu-240	Th-228	1.000E+00	2.952E-21	8.355E-20	1.756E-18	7.746E-17	1.046E-15	1.657E-15	1.580E-14	0.000E+00	0.000E+00	
Pu-240	\$DSR(j)		2.077E-01	2.063E-01	2.034E-01	1.933E-01	1.718E-01	1.647E-01	6.697E-02	0.000E+00	0.000E+00	
Sr-90	Sr-90	1.000E+00	1.136E+00	1.100E+00	1.031E+00	8.205E-01	4.987E-01	4.212E-01	2.922E-02	0.000E+00	0.000E+00	
U-234	U-234	1.000E+00	4.098E-02	3.880E-02	3.476E-02	2.363E-02	1.025E-02	7.734E-03	1.109E-04	0.000E+00	0.000E+00	
U-234	Th-230	1.000E+00	2.340E-07	6.729E-07	1.471E-06	3.578E-06	5.695E-06	5.954E-06	3.236E-06	0.000E+00	0.000E+00	
U-234	Ra-226	1.000E+00	4.941E-09	3.430E-08	1.751E-07	1.366E-06	6.050E-06	7.888E-06	2.265E-05	0.000E+00	0.000E+00	
U-234	Pb-210	1.000E+00	1.204E-11	1.556E-10	1.590E-09	3.295E-08	3.042E-07	4.517E-07	2.008E-06	0.000E+00	0.000E+00	
U-234	\$DSR(j)		4.098E-02	3.880E-02	3.476E-02	2.364E-02	1.026E-02	7.748E-03	1.388E-04	0.000E+00	0.000E+00	
U-235	U-235	1.000E+00	5.237E-01	4.984E-01	4.515E-01	3.193E-01	1.513E-01	1.178E-01	2.903E-03	0.000E+00	0.000E+00	
U-235	Pa-231	1.000E+00	3.584E-05	1.086E-04	2.405E-04	5.758E-04	8.626E-04	8.812E-04	3.189E-04	0.000E+00	0.000E+00	
U-235	Ac-227	1.000E+00	3.678E-07	2.315E-06	1.094E-05	7.335E-05	2.445E-04	2.906E-04	2.527E-04	0.000E+00	0.000E+00	
U-235	\$DSR(j)		5.237E-01	4.985E-01	4.518E-01	3.199E-01	1.524E-01	1.190E-01	3.475E-03	0.000E+00	0.000E+00	

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
U-238	U-238	1.000E+00	1.295E-01	1.230E-01	1.110E-01	7.746E-02	3.564E-02	2.746E-02	5.802E-04	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	5.756E-08	1.645E-07	3.445E-07	7.032E-07	7.408E-07	6.687E-07	3.161E-08	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	2.228E-13	1.475E-12	7.162E-12	4.886E-11	1.648E-10	1.966E-10	1.832E-10	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	3.459E-15	5.124E-14	5.700E-13	1.252E-11	1.199E-10	1.800E-10	1.038E-09	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	7.092E-18	1.870E-16	4.030E-15	2.343E-13	4.817E-12	8.322E-12	8.383E-11	0.000E+00	0.000E+00
U-238	\$DSR(j)		1.295E-01	1.230E-01	1.110E-01	7.746E-02	3.564E-02	2.746E-02	5.802E-04	0.000E+00	0.000E+00

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 \$ is used to indicate summation; the Greek sigma is not included in this font.
 The DSR includes contributions from associated (half-life <= 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 1.000E+02 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
Am-241	4.166E+02	4.198E+02	4.264E+02	4.507E+02	5.110E+02	5.341E+02	1.234E+03	*3.430E+12	*3.430E+12
Co-60	1.124E+01	1.293E+01	1.713E+01	4.586E+01	3.806E+02	7.724E+02	1.961E+07	*1.131E+15	*1.131E+15
Cs-134	1.970E+01	2.763E+01	5.437E+01	5.813E+02	9.375E+04	5.113E+05	*1.294E+15	*1.294E+15	*1.294E+15
Cs-137	4.553E+01	4.669E+01	4.911E+01	5.865E+01	8.627E+01	9.831E+01	7.706E+02	*8.701E+13	*8.701E+13
Eu-152	2.452E+01	2.589E+01	2.886E+01	4.226E+01	9.626E+01	1.269E+02	7.645E+03	*1.765E+14	*1.765E+14
Pu-239	4.811E+02	4.844E+02	4.911E+02	5.161E+02	5.791E+02	6.036E+02	1.465E+03	*6.212E+10	*6.212E+10
Pu-240	4.814E+02	4.848E+02	4.917E+02	5.173E+02	5.820E+02	6.072E+02	1.493E+03	*2.277E+11	*2.277E+11
Sr-90	8.802E+01	9.091E+01	9.700E+01	1.219E+02	2.005E+02	2.374E+02	3.423E+03	*1.365E+14	*1.365E+14
U-234	2.440E+03	2.577E+03	2.877E+03	4.230E+03	9.746E+03	1.291E+04	7.204E+05	*6.245E+09	*6.245E+09
U-235	1.909E+02	2.006E+02	2.213E+02	3.126E+02	6.560E+02	8.404E+02	2.878E+04	*2.160E+06	*2.160E+06
U-238	7.724E+02	8.130E+02	9.008E+02	1.291E+03	2.806E+03	3.642E+03	1.724E+05	*3.360E+05	*3.360E+05

*At specific activity limit

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

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.000E+02	0.000E+00	2.400E-01	4.166E+02	2.400E-01	4.166E+02
Co-60	1.000E+02	0.000E+00	8.897E+00	1.124E+01	8.897E+00	1.124E+01
Cs-134	1.000E+02	0.000E+00	5.076E+00	1.970E+01	5.076E+00	1.970E+01
Cs-137	1.000E+02	0.000E+00	2.196E+00	4.553E+01	2.196E+00	4.553E+01
Eu-152	1.000E+02	0.000E+00	4.078E+00	2.452E+01	4.078E+00	2.452E+01
Pu-239	1.000E+02	0.000E+00	2.078E-01	4.811E+02	2.078E-01	4.811E+02
Pu-240	1.000E+02	0.000E+00	2.077E-01	4.814E+02	2.077E-01	4.814E+02
Sr-90	1.000E+02	0.000E+00	1.136E+00	8.802E+01	1.136E+00	8.802E+01
U-234	1.000E+02	0.000E+00	4.098E-02	2.440E+03	4.098E-02	2.440E+03
U-235	1.000E+02	0.000E+00	5.237E-01	1.909E+02	5.237E-01	1.909E+02
U-238	1.000E+02	0.000E+00	1.295E-01	7.724E+02	1.295E-01	7.724E+02

Individual Nuclide Dose Summed Over All Pathways
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr									
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
Am-241	Am-241	1.000E+00	2.400E+01	2.382E+01	2.345E+01	2.219E+01	1.957E+01	1.872E+01	8.099E+00	0.000E+00	0.000E+00	
Np-237	Am-241	1.000E+00	4.109E-05	1.260E-04	2.931E-04	8.417E-04	1.832E-03	2.107E-03	3.144E-03	0.000E+00	0.000E+00	
U-233	Am-241	1.000E+00	1.289E-12	7.962E-12	3.882E-11	3.124E-10	1.551E-09	2.094E-09	7.629E-09	0.000E+00	0.000E+00	
Th-229	Am-241	1.000E+00	7.844E-16	1.154E-14	1.326E-13	3.381E-12	4.442E-11	7.377E-11	1.413E-09	0.000E+00	0.000E+00	
Co-60	Co-60	1.000E+00	8.897E+02	7.731E+02	5.837E+02	2.181E+02	2.627E+01	1.295E+01	5.099E-04	0.000E+00	0.000E+00	
Cs-134	Cs-134	1.000E+00	5.076E+02	3.619E+02	1.839E+02	1.720E+01	1.067E-01	1.956E-02	7.528E-13	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	2.196E+02	2.142E+02	2.036E+02	1.705E+02	1.159E+02	1.017E+02	1.298E+01	0.000E+00	0.000E+00	
Eu-152	Eu-152	7.208E-01	2.940E+02	2.784E+02	2.497E+02	1.706E+02	7.488E+01	5.679E+01	9.428E-01	0.000E+00	0.000E+00	
Eu-152	Eu-152	2.792E-01	1.139E+02	1.078E+02	9.674E+01	6.606E+01	2.901E+01	2.200E+01	3.652E-01	0.000E+00	0.000E+00	
Eu-152	\$DOSE(j)		4.078E+02	3.863E+02	3.465E+02	2.366E+02	1.039E+02	7.879E+01	1.308E+00	0.000E+00	0.000E+00	
Gd-152	Eu-152	2.792E-01	3.156E-15	9.196E-15	2.012E-14	4.833E-14	7.484E-14	7.762E-14	3.907E-14	0.000E+00	0.000E+00	
Pu-239	Pu-239	1.000E+00	2.078E+01	2.064E+01	2.036E+01	1.938E+01	1.727E+01	1.657E+01	6.824E+00	0.000E+00	0.000E+00	
U-235	Pu-239	1.000E+00	2.595E-08	7.620E-08	1.693E-07	4.293E-07	7.462E-07	8.043E-07	7.395E-07	0.000E+00	0.000E+00	
U-235	U-235	1.000E+00	5.237E+01	4.984E+01	4.515E+01	3.193E+01	1.513E+01	1.178E+01	2.903E-01	0.000E+00	0.000E+00	
U-235	\$DOSE(j)		5.237E+01	4.984E+01	4.515E+01	3.193E+01	1.513E+01	1.178E+01	2.903E-01	0.000E+00	0.000E+00	
Pa-231	Pu-239	1.000E+00	1.132E-12	8.237E-12	4.261E-11	3.261E-10	1.350E-09	1.719E-09	3.292E-09	0.000E+00	0.000E+00	
Pa-231	U-235	1.000E+00	3.584E-03	1.086E-02	2.405E-02	5.758E-02	8.626E-02	8.812E-02	3.189E-02	0.000E+00	0.000E+00	
Pa-231	\$DOSE(j)		3.584E-03	1.086E-02	2.405E-02	5.758E-02	8.626E-02	8.812E-02	3.189E-02	0.000E+00	0.000E+00	
Ac-227	Pu-239	1.000E+00	9.433E-15	1.270E-13	1.332E-12	2.788E-11	2.559E-10	3.796E-10	1.893E-09	0.000E+00	0.000E+00	
Ac-227	U-235	1.000E+00	3.678E-05	2.315E-04	1.094E-03	7.335E-03	2.445E-02	2.906E-02	2.527E-02	0.000E+00	0.000E+00	
Ac-227	\$DOSE(j)		3.678E-05	2.315E-04	1.094E-03	7.335E-03	2.445E-02	2.906E-02	2.527E-02	0.000E+00	0.000E+00	
Pu-240	Pu-240	1.000E+00	2.077E+01	2.063E+01	2.034E+01	1.933E+01	1.718E+01	1.647E+01	6.697E+00	0.000E+00	0.000E+00	
U-236	Pu-240	1.000E+00	5.757E-08	1.730E-07	3.971E-07	1.109E-06	2.284E-06	2.578E-06	2.803E-06	0.000E+00	0.000E+00	
Th-232	Pu-240	1.000E+00	6.425E-18	4.367E-17	2.245E-16	1.871E-15	9.491E-15	1.288E-14	4.966E-14	0.000E+00	0.000E+00	
Ra-228	Pu-240	1.000E+00	3.364E-18	4.993E-17	5.505E-16	1.169E-14	1.094E-13	1.648E-13	1.281E-12	0.000E+00	0.000E+00	
Th-228	Pu-240	1.000E+00	2.952E-19	8.355E-18	1.756E-16	7.746E-15	1.046E-13	1.657E-13	1.580E-12	0.000E+00	0.000E+00	
Sr-90	Sr-90	1.000E+00	1.136E+02	1.100E+02	1.031E+02	8.205E+01	4.987E+01	4.212E+01	2.922E+00	0.000E+00	0.000E+00	
U-234	U-234	1.000E+00	4.098E+00	3.880E+00	3.476E+00	2.363E+00	1.025E+00	7.734E-01	1.109E-02	0.000E+00	0.000E+00	
U-234	U-238	1.000E+00	5.756E-06	1.645E-05	3.445E-05	7.032E-05	7.408E-05	6.687E-05	3.161E-06	0.000E+00	0.000E+00	
U-234	\$DOSE(j)		4.098E+00	3.880E+00	3.476E+00	2.364E+00	1.025E+00	7.735E-01	1.110E-02	0.000E+00	0.000E+00	

Individual Nuclide Dose Summed Over All Pathways
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr									
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
Th-230	U-234	1.000E+00	2.340E-05	6.729E-05	1.471E-04	3.578E-04	5.695E-04	5.954E-04	3.236E-04	0.000E+00	0.000E+00	
Th-230	U-238	1.000E+00	2.228E-11	1.475E-10	7.162E-10	4.886E-09	1.648E-08	1.966E-08	1.832E-08	0.000E+00	0.000E+00	
Th-230	\$DOSE(j)		2.340E-05	6.729E-05	1.471E-04	3.578E-04	5.695E-04	5.954E-04	3.236E-04	0.000E+00	0.000E+00	
Ra-226	U-234	1.000E+00	4.941E-07	3.430E-06	1.751E-05	1.366E-04	6.050E-04	7.888E-04	2.265E-03	0.000E+00	0.000E+00	
Ra-226	U-238	1.000E+00	3.459E-13	5.124E-12	5.700E-11	1.252E-09	1.199E-08	1.800E-08	1.038E-07	0.000E+00	0.000E+00	
Ra-226	\$DOSE(j)		4.941E-07	3.430E-06	1.751E-05	1.366E-04	6.050E-04	7.889E-04	2.265E-03	0.000E+00	0.000E+00	
Pb-210	U-234	1.000E+00	1.204E-09	1.556E-08	1.590E-07	3.295E-06	3.042E-05	4.517E-05	2.008E-04	0.000E+00	0.000E+00	
Pb-210	U-238	1.000E+00	7.092E-16	1.870E-14	4.030E-13	2.343E-11	4.817E-10	8.322E-10	8.383E-09	0.000E+00	0.000E+00	
Pb-210	\$DOSE(j)		1.204E-09	1.556E-08	1.590E-07	3.295E-06	3.042E-05	4.517E-05	2.008E-04	0.000E+00	0.000E+00	
U-238	U-238	1.000E+00	1.295E+01	1.230E+01	1.110E+01	7.746E+00	3.564E+00	2.746E+00	5.802E-02	0.000E+00	0.000E+00	

BRF(i) is the branch fraction of the parent nuclide.
 \$ is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g																		
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03									
Am-241	Am-241	1.000E+00	1.000E+02	9.982E+01	9.945E+01	9.818E+01	9.552E+01	9.465E+01	8.326E+01	4.000E+01	1.600E+01										
Np-237	Am-241	1.000E+00	0.000E+00	3.234E-05	9.671E-05	3.188E-04	7.783E-04	9.267E-04	2.765E-03	7.359E-03	6.723E-03										
U-233	Am-241	1.000E+00	0.000E+00	7.059E-11	6.311E-10	6.850E-09	4.074E-08	5.771E-08	5.111E-07	3.952E-06	4.515E-06										
Th-229	Am-241	1.000E+00	0.000E+00	2.224E-15	5.974E-14	2.174E-12	3.271E-11	5.583E-11	1.742E-09	9.088E-08	2.942E-07										
Co-60	Co-60	1.000E+00	1.000E+02	8.708E+01	6.603E+01	2.507E+01	3.147E+00	1.576E+00	9.808E-05	9.076E-29	0.000E+00										
Cs-134	Cs-134	1.000E+00	1.000E+02	7.143E+01	3.644E+01	3.456E+00	2.221E-02	4.129E-03	2.433E-13	0.000E+00	0.000E+00										
Cs-137	Cs-137	1.000E+00	1.000E+02	9.770E+01	9.326E+01	7.923E+01	5.588E+01	4.974E+01	9.752E+00	8.822E-04	7.783E-09										
Eu-152	Eu-152	7.208E-01	7.208E+01	6.840E+01	6.159E+01	4.268E+01	1.944E+01	1.496E+01	3.815E-01	2.992E-10	1.242E-21										
Eu-152	Eu-152	2.792E-01	2.792E+01	2.649E+01	2.386E+01	1.653E+01	7.531E+00	5.794E+00	1.478E-01	1.159E-10	4.812E-22										
Eu-152	SS(j):		1.000E+02	9.489E+01	8.545E+01	5.921E+01	2.697E+01	2.075E+01	5.292E-01	4.152E-10	1.724E-21										
Gd-152	Eu-152	2.792E-01	0.000E+00	1.745E-13	4.971E-13	1.391E-12	2.481E-12	2.688E-12	3.287E-12	2.799E-12	2.273E-12										
Pu-239	Pu-239	1.000E+00	1.000E+02	9.999E+01	9.997E+01	9.990E+01	9.976E+01	9.971E+01	9.903E+01	9.524E+01	9.072E+01										
U-235	Pu-239	1.000E+00	0.000E+00	9.615E-08	2.751E-07	7.812E-07	1.429E-06	1.560E-06	2.012E-06	1.951E-06	1.859E-06										
U-235	U-235	1.000E+00	1.000E+02	9.530E+01	8.655E+01	6.177E+01	2.999E+01	2.357E+01	8.092E-01	3.470E-09	1.204E-19										
U-235	SS(j):		1.000E+02	9.530E+01	8.655E+01	6.177E+01	2.999E+01	2.357E+01	8.092E-01	1.955E-06	1.859E-06										
Pa-231	Pu-239	1.000E+00	0.000E+00	1.023E-12	8.879E-12	8.718E-11	4.253E-10	5.667E-10	2.599E-09	5.858E-09	5.800E-09										
Pa-231	U-235	1.000E+00	0.000E+00	2.059E-03	5.848E-03	1.618E-02	2.778E-02	2.961E-02	2.536E-02	1.653E-03	5.331E-05										
Pa-231	SS(j):		0.000E+00	2.059E-03	5.848E-03	1.618E-02	2.778E-02	2.961E-02	2.536E-02	1.653E-03	5.331E-05										
Ac-227	Pu-239	1.000E+00	0.000E+00	1.077E-14	2.762E-13	8.568E-12	9.311E-11	1.433E-10	1.333E-09	3.797E-09	3.784E-09										
Ac-227	U-235	1.000E+00	0.000E+00	3.253E-05	2.733E-04	2.394E-03	9.136E-03	1.122E-02	1.796E-02	1.252E-03	4.039E-05										
Ac-227	SS(j):		0.000E+00	3.253E-05	2.733E-04	2.394E-03	9.136E-03	1.122E-02	1.796E-02	1.252E-03	4.039E-05										
Pu-240	Pu-240	1.000E+00	1.000E+02	9.997E+01	9.992E+01	9.972E+01	9.931E+01	9.917E+01	9.726E+01	8.704E+01	7.576E+01										
U-236	Pu-240	1.000E+00	0.000E+00	2.950E-06	8.787E-06	2.857E-05	6.778E-05	7.994E-05	2.111E-04	3.775E-04	3.409E-04										
Th-232	Pu-240	1.000E+00	0.000E+00	7.285E-17	6.525E-16	7.132E-15	4.304E-14	6.126E-14	5.828E-13	7.229E-12	1.613E-11										
Ra-228	Pu-240	1.000E+00	0.000E+00	2.839E-18	7.191E-17	2.163E-15	2.324E-14	3.608E-14	4.849E-13	6.805E-12	1.537E-11										
Th-228	Pu-240	1.000E+00	0.000E+00	2.411E-19	1.622E-17	1.137E-15	1.786E-14	2.908E-14	4.594E-13	6.755E-12	1.532E-11										
Sr-90	Sr-90	1.000E+00	1.000E+02	9.746E+01	9.258E+01	7.733E+01	5.259E+01	4.624E+01	7.647E+00	2.615E-04	6.838E-10										
U-234	U-234	1.000E+00	1.000E+02	9.530E+01	8.654E+01	6.177E+01	2.999E+01	2.357E+01	8.090E-01	3.465E-09	1.201E-19										
U-234	U-238	1.000E+00	0.000E+00	2.702E-04	7.361E-04	1.751E-03	2.126E-03	2.005E-03	2.294E-04	4.916E-12	3.409E-22										
U-234	SS(j):		1.000E+02	9.530E+01	8.655E+01	6.177E+01	2.999E+01	2.357E+01	8.092E-01	3.470E-09	1.204E-19										

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g									
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.500E+01	3.000E+01	1.000E+02	5.000E+02	1.000E+03
Th-230	U-234	1.000E+00	0.000E+00	8.788E-04	2.514E-03	7.143E-03	1.308E-02	1.428E-02	1.851E-02	1.856E-02	1.842E-02	
Th-230	U-238	1.000E+00	0.000E+00	1.236E-09	1.044E-08	9.316E-08	3.727E-07	4.658E-07	1.047E-06	1.092E-06	1.084E-06	
Th-230	ΣS(j):		0.000E+00	8.788E-04	2.514E-03	7.143E-03	1.308E-02	1.428E-02	1.852E-02	1.856E-02	1.842E-02	
Ra-226	U-234	1.000E+00	0.000E+00	1.916E-07	1.664E-06	1.641E-05	8.076E-05	1.079E-04	5.179E-04	1.394E-03	1.494E-03	
Ra-226	U-238	1.000E+00	0.000E+00	1.796E-13	4.612E-12	1.436E-10	1.575E-09	2.431E-09	2.368E-08	8.118E-08	8.788E-08	
Ra-226	ΣS(j):		0.000E+00	1.916E-07	1.664E-06	1.641E-05	8.076E-05	1.079E-04	5.179E-04	1.394E-03	1.494E-03	
Pb-210	U-234	1.000E+00	0.000E+00	1.976E-09	5.108E-08	1.628E-06	1.867E-05	2.921E-05	3.248E-04	1.236E-03	1.345E-03	
Pb-210	U-238	1.000E+00	0.000E+00	1.393E-15	1.069E-13	1.094E-11	2.896E-10	5.293E-10	1.352E-08	7.185E-08	7.909E-08	
Pb-210	ΣS(j):		0.000E+00	1.976E-09	5.108E-08	1.628E-06	1.867E-05	2.921E-05	3.248E-04	1.236E-03	1.345E-03	
U-238	U-238	1.000E+00	1.000E+02	9.530E+01	8.655E+01	6.177E+01	2.999E+01	2.357E+01	8.092E-01	3.470E-09	1.204E-19	

BRF(i) is the branch fraction of the parent nuclide.
 \$ is used to indicate summation; the Greek sigma is not included in this font.
 RESCALC.EXE execution time = 2.97 seconds